SCOTTISH HOSPITALS INQUIRY

Bundle of documents for Oral hearings commencing from 16 September 2025 in relation to the Queen Elizabeth University Hospital and the Royal Hospital for Children, Glasgow

Bundle 48 – Governance PPP

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Health Finance Directorate
Capital Planning and Asset Management Division

The Scottish Government

CEL 19 (2009)

6 May 2009

Dear Colleague

SCOTTISH CAPITAL INVESTMENT MANUAL FOR NHSSCOTLAND

Summary

1. This letter notifies colleagues of the publication of the updated Scottish Capital Investment Manual (SCIM) for NHSScotland. **This guidance must be followed in respect of all infrastructure investment by NHSScotland bodies**.

2. This CEL consolidates and updates a range of guidance and supersedes the following extant guidance - Scottish Capital Investment Manual (1996), HDL (2002)40, HDL (2002)87, HDL (2003)13, HDL (2003)58 and HDL (2005)19.

3. The guidance has been prepared by Scottish Government Health Directorates in consultation with relevant Scottish Government stakeholders including Health Facilities Scotland and NHS Boards and takes into account all relevant policy and technical requirements. The updated SCIM creates a framework within which NHS Boards can plan, develop, procure and manage their infrastructure projects effectively and efficiently.

Action

4. **The guidance contained within the SCIM is mandatory and must be followed by NHSScotland bodies. All NHSScotland Bodies and the SGHD Capital Investment Group should consider business cases in the context of the updated SCIM.**

Access and Updating

5. The SCIM is only being made available in electronic format at http://www.scim.scot.nhs.uk/. By holding the SCIM in electronic form, the SCIM will be updated on a regular basis to reflect emerging best practice and developing policy.

6. These updates will be notified to NHSScotland bodies via e mail notification. The established network of nominated contacts within NHS Boards and Special Boards will be consulted on proposed changes.

Addresses

For action
Chief Executives, NHS Boards.
Chief Executives, Special Health Boards.
Directors of Finance, NHSScotland Strategic Facilities Group.
NHSScotland Property Advisory Group.

For information
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7. In addition to the existing manuals a new guide on Option Appraisal has been prepared which can, in addition to supporting the production of business cases, be used to support the assessment of service change proposals. The Scottish Health Council has been consulted on the development of this guidance.

Transitional Arrangements

8. Projects for which an Outline Business Case, Standard Business Case or Full Business Case submission has been scheduled for consideration by the CIG up to and including June 2009 will be made using the existing SCIM and supplementary guidance. Projects for which a case is scheduled for submission at the July 2009 CIG meeting or beyond must follow the revised SCIM guidance.

Advice on the Updated SCIM

9. Requests for advice should be directed to me in the first instance. A series of training and development courses are being developed and notification of these will be made through the SCIM website and through Health Facilities Scotland's Training and Development Programme for 2009-10.

Yours sincerely

Mike Baxter

Deputy Director, Capital Planning and Asset Management

Scottish Health Facilities Note 30

Version 2

Infection Control in the Built Environment: Design and Planning

NHSScotland, P&EFEx, August 2005

A53204712

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The production of this document was jointly funded by the Scottish Executive Health Department and the NHSScotland Property and Environment Forum.

1. Scope

1.1 This document is a revision of Scottish Health Facilities Note 30 (SHFN 30): 'Infection Control in the built environment: design and planning' which was published in 2002. The need for a revised document has become increasingly apparent in light of the determined focus being applied to reducing Healthcare Associated Infections (HAIs). This focus has highlighted the need for initial, rigorous examination of proposals for new build healthcare facilities, extensions to healthcare facilities, and refurbishment of healthcare facilities in relation to prevention and control of infection. Having highlighted the need for a rigorous examination of proposals in relation to new healthcare facilities, good practice also requires an ongoing audit of existing healthcare facilities.

1.2 SHFN 30 is intended to guide and stimulate thinking on the planning and execution of new construction and refurbishment works in all types of healthcare facilities.

1.3 The document is aimed at all those involved in the provision of new or refurbished facilities and aims to ensure that prevention and control of infection issues are identified, analysed and planned for at the earliest stage of a project.

1.4 Project team members and contributors from various disciplines will take different points from the document and it is the ensuing debate and analysis which will improve the quality of the delivered facility.

1.5 SHFN 30 should also be seen as a reference guide, for use in conjunction with the HAI System for the Control of Risk of Infection in the Built Environment (HAI-SCRIBE), which is concurrently being developed for use within NHSScotland. HAI-SCRIBE aims to reduce infection hazards through the development of a prevention and control of infection questionnaire using a number of scenarios within the built healthcare environment.

These scenarios are:

- the proposed site for development of a healthcare facility;
- the design and planning stage of the proposed healthcare facility;
- the construction and refurbishment stage of the healthcare facility;
- the ongoing maintenance of the healthcare facility.

1.6 Although HAI-SCRIBE is intended mainly for new build and refurbishment of healthcare facilities, the question set relating to ongoing maintenance should also be applied to all existing healthcare facilities. Continual maintenance of existing healthcare buildings is important in ensuring that there is no deterioration of existing healthcare facilities. The built environment includes existing buildings used for healthcare purposes and new build projects, and the intention is to apply HAI-SCRIBE from design and planning through to occupation and operation of the facility.

2. Introduction

2.1 In recent years there has been an increase in concern about the risks to health from receiving treatment and care in healthcare facilities. The Report of a Joint Scottish Executive Health Department and NHSScotland Working Group (Carey Group 2001) states that studies have found:

- an estimated 9% of hospital patients acquire an infection during their stay;
- risks are not only present in hospitals but also in primary healthcare and social care settings;
- there is a risk of vCJD, the human form of BSE, being spread from person to person by surgical instruments.

Furthermore, a report by Walker (2001) estimates that the total cost to Scotland of HAI is approximately £186 million per annum.

2.2 Advances in technical and therapeutic methodologies are among the range of factors which present further challenges in relation to control of infection. Organisms with antimicrobial resistance have become a major public health threat, making infection occurring within healthcare premises increasingly difficult to treat. Infection originating in hospitals and other healthcare facilities is now recognised as a serious and widespread problem. Although standards of hygiene in healthcare facilities and standards of personal hygiene have been identified as likely sources of infection and infection spread, it can also be said that the design, planning, construction, refurbishment and ongoing maintenance of the healthcare facility also have an important role to play in the control of infection. The physical environment has to assist, not hinder, good practice.

Origins

2.3 Healthcare Associated Infection (HAI) is a priority issue for NHSScotland. A major programme of work to improve the prevention and control of HAI across NHSScotland was laid out in the Ministerial HAI Action Plan, HDL(2002)82. Under the Chairmanship of the Chief Medical Officer (CMO), the HAI Task Force is now carrying out the programme of work highlighted by the Action Plan. Part of the HAI Task Force 3-year programme of work involves producing guidance on updating the physical environment for older buildings and reviewing the current guidance relating to prevention and control of infection in the built environment; the HAI Task Force Groups 6 & 8 have been charged with undertaking this work. These groups have been combined and are led by the NHSScotland Property and Environment Forum.

Background

2.4 Healthcare Associated Infection (HAI) can be described as infection that is acquired during a visit or is related to a stay in a healthcare facility. In recent years there has been an increase in concern surrounding the risks to health from receiving treatment and care in healthcare facilities. Incidences of HAI are

now recognised as a serious and widespread problem, although the true extent of healthcare associated infection is difficult to quantify.

2.5 As part of the national HAI strategy, an HAI prevalence survey will be undertaken to provide data on the overall burden and costs of HAI to Scotland. This survey is being progressed by the HAI Task Force, through Health Protection Scotland (HPS). The Pilot Survey started in May 2005.

2.6 HAI is significant medically because of the associated mortality and morbidity. This is highlighted by the fact that approximately 1 in 10 patients acquire an infection as a result of receiving treatment and care in healthcare facilities (Plowman et al, 1999). It is also important economically, with one estimate suggesting that the annual cost to NHSScotland due to HAI may be as high as £186 million with the loss of 380,000 bed days (Walker, 2001). Furthermore, research findings show that at least 20% of HAIs are preventable (Harbarth, 2003). Control of HAI is therefore a major concern, and the high incidence of HAI is seen as evidence of poor quality of healthcare delivery, which leads inevitably to avoidable costs (WHO, 2002). It has been estimated that the compensation cost from clinical negligence resulting in HAI is £4 million per annum and non-conformance with recommendations and guidelines of all kinds accounts for 32% of United Kingdom NHS compensation costs (Wanless, 2001).

2.7 The Report of a Joint Scottish Executive Health Department and NHSScotland Working Group in April 2002 states that HAI can affect patients, staff and others in all healthcare settings, not just in hospitals. Potential consequences to health as a result of HAI may be wide ranging including hospital admission, prolonged stay, absence from work, increased costs to the NHS, the individual and/or families, and emotional distress to the latter.

2.8 The most common types of HAIs are urinary tract infection, surgical site infection, and lower respiratory tract infections such as pneumonia, which account for an estimated 92% of all HAIs. Figure 1 adapted from Ayliffe (1992) shows the routes of transmission for Healthcare Associated Infections.

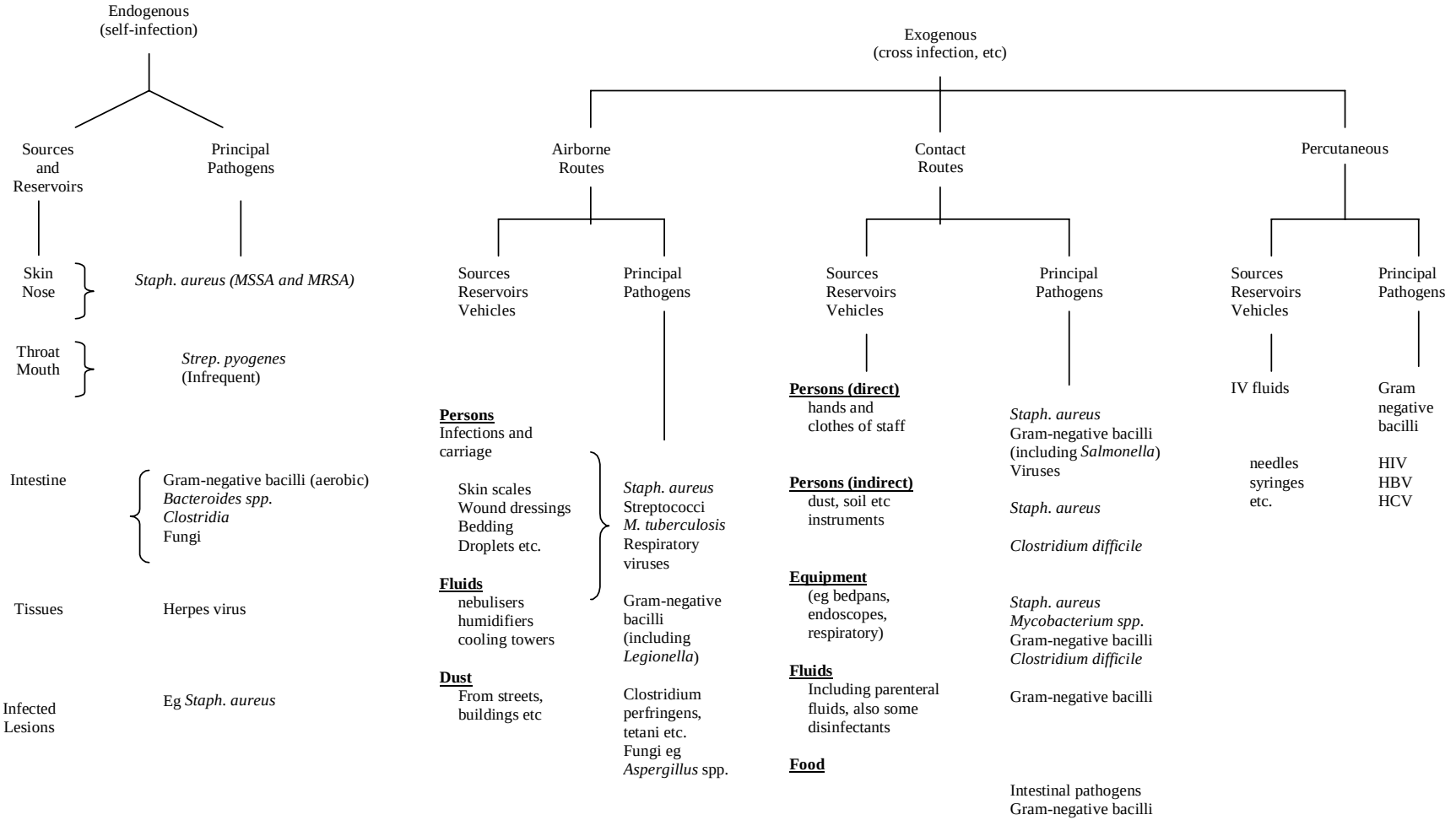
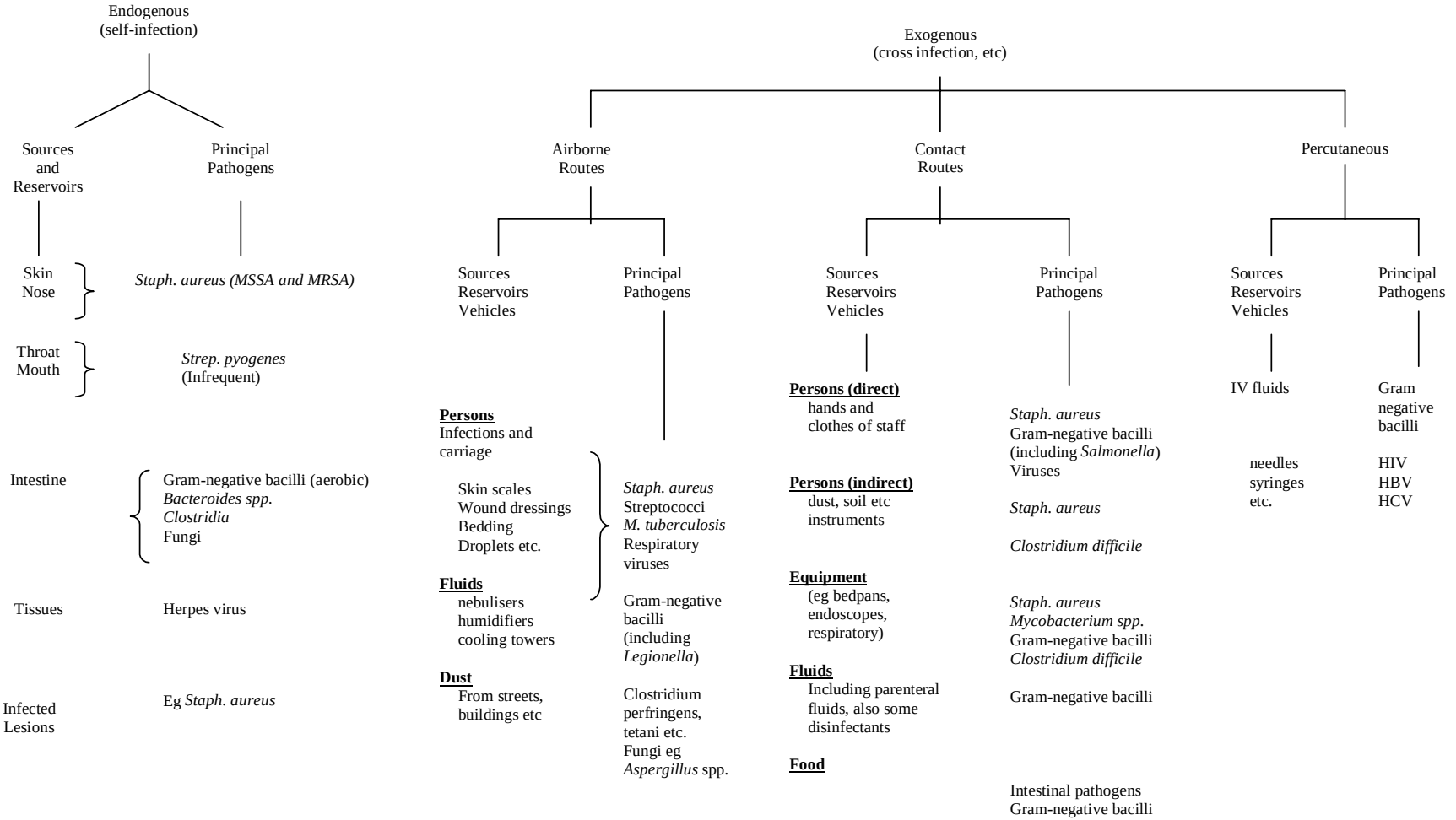


Figure 1: Roots of transmission adapted from Ayliffe (1992)



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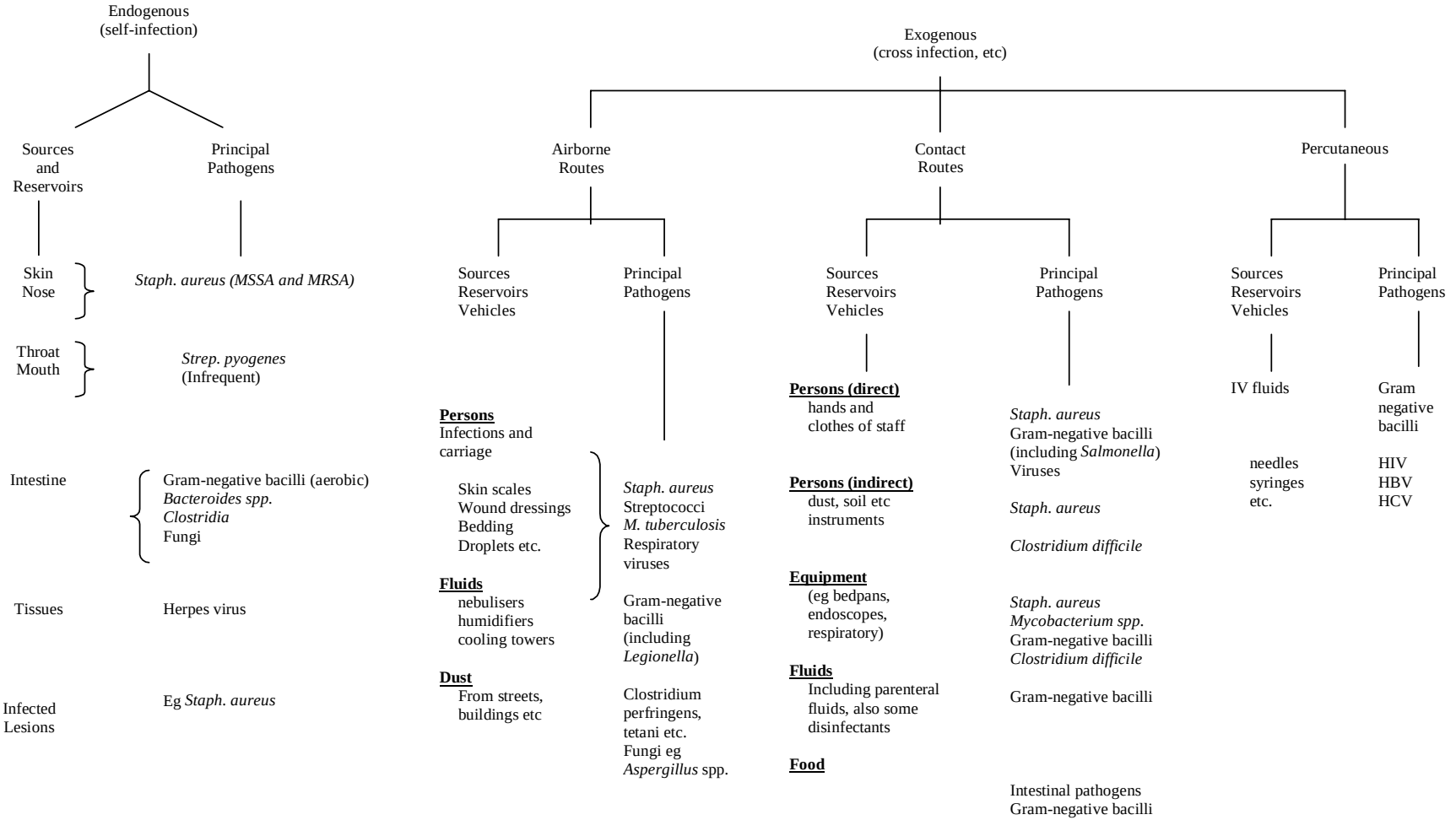

Figure 1: Roots of transmission adapted from Ayliffe (1992)

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Purpose of this document

2.9 This guidance document should not be seen as being an infection control manual or a comprehensive guide to the principles underpinning the global issues surrounding prevention and control of infection. It should be seen as guidance which highlights the prevention and control of infection issues associated with site development, design and planning, construction and refurbishment and on-going maintenance of the healthcare facility.

2.10 The document's principal aim is to provide information on the prevention and control of infection, and on the prevention of cross-infection and cross contamination in healthcare facilities, to those responsible for the planning, design and maintenance of such facilities. It is imperative that those involved in these processes have a sound knowledge of prevention and control of infection in the built environment. This document can provide an insight to the key factors within the built environment which can impact on the control of infection. However, further knowledge may be gained by training in HAI which is available from a variety of sources from basic induction training to specialist post graduate level courses such as 'Controlling the risk from Healthcare Associated Infection in healthcare environments' module which is provided by Glasgow Caledonian University as part of the MSc Healthcare Property and Facilities Management. It is therefore intended as a first point of reference on prevention and control of infection for healthcare estates and facilities managers, architects, builders, engineers, surveyors, health planners and Infection Control Teams working on healthcare estate new build and refurbishment projects. It will also be useful as a guide for best practice in existing healthcare facilities.

2.11 Throughout the various sections of the document there are a number of key themes which are repeated. These are:

- Project Team;
- Importance of education;
- Risk management;
- Legislative issues.

2.12 These themes are discussed in Sections 3-6 of this document, in order to give an indication of why they are important in relation to the prevention and control of infection within the built healthcare environment.

2.13 Sections 7-13 refer to the processes involved in the development and maintenance of the healthcare facility. These Sections highlight how the key issues fit into the processes involved in the development and maintenance of the healthcare facility.

The built environment and quality of care

2.14 HAI is a complex issue involving the whole patient journey and the many different elements of treatment and care provision, however, it is clear that the built environment plays a key role in the prevention and control of HAI.

2.15 Developing solutions to this serious problem requires a clear understanding of how the commissioning, planning, design, procurement, construction and operation and maintenance of healthcare properties can contribute to the prevention and control of HAI. The absence of a holistic approach to the management of these stages of development and maintenance of healthcare facilities may compromise prevention and control of infection. Although there is a need to improve the evidence base in some areas, much of the knowledge surrounding the control of HAI has been published in standards, journals and guidelines. Much of the solution to the existing HAI problem lies in the effective dissemination and implementation of existing knowledge to all involved, in a logical, accessible form.

3. The Project Team

3.1 Healthcare Associated Infection (HAI) is a complex issue involving the many different elements of patient care and provision. Due to its multi-factorial nature there is a need to develop a holistic approach to combating the spread of infection within the built environment. To achieve this, knowledge from a wide variety of sources is needed including Infection Control Specialists, Architects, Facilities Managers and Engineers.

3.2 A comprehensive approach to planning needs to include consultation with, and participation of, appropriate specialists from its inception through to post-project evaluation.

Management of the Project

3.3 The Scottish Executive Health Department's, Scottish Capital Investment Manual (SCIM) sets out the organisational structure of the Project within NHSScotland, a summary of which can be described as follows:

NHS Board internal organisation

i. **NHS Board** - monitor cost and progress of all capital investment projects at regular meetings. If problems are identified, it needs to be satisfied that appropriate steps are being taken;

ii. **Chief Executive Officer** – accountable to NHS Board. May be only person with total responsibility for project and any other related activities. Responsible for management of all major capital schemes at all stages of the process from inception to post project evaluation;

iii. **Project Board** - comprising senior staff within the NHS Board who have an interest in the project and whose activities will be affected by the project, e.g. staff from clinical areas such as infection control;

iv. **Project Director** - responsible for overall project management. Managing the NHS Boards interest in the Project. Evaluating competence of and appointing Consultants and Contractors who will undertake design and construction activity and act as point of contract in dealings with Contractors;

v. **Professional Adviser** - experienced in construction and design, especially of healthcare facilities;

vi. **User Panel** - representatives of each of the relevant service departments, in each case authorised to define their department's needs and to review and agree how those needs are to be met.

External resources:

i. **Project Manager** – NHS Boards rarely have capacity in-house to develop and manage all aspects of the project, therefore it is usually necessary to appoint external Advisors and Consultants. The Project Manager's role is to provide a single point of responsibility for the project brief and design. They also oversee the day to day progress of the project;

ii. **Other Consultants** – this includes Design Consultants, M & E Engineers and Architects. They are managed by the Project Manager, appointed by the Project Director. However, their responsibility will be to, and their contracts with, the NHS Board.

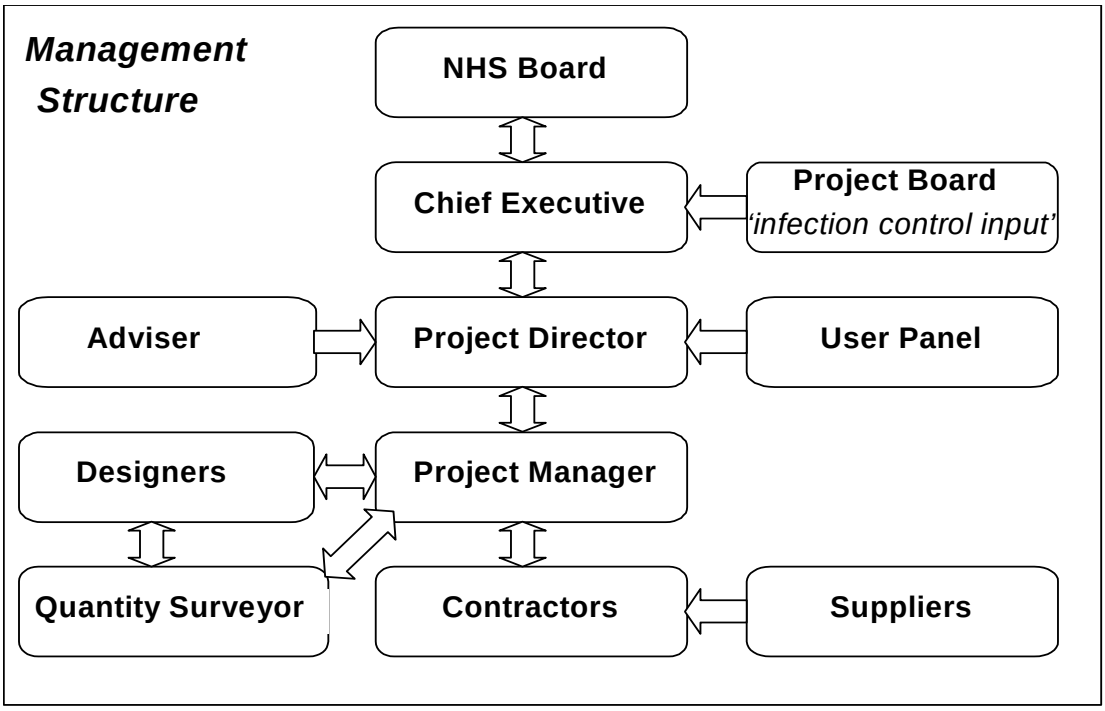

Table 1: Highlighting the management structure of the key players involved in the development of the healthcare facility

Importance of experience and understanding of prevention and control of infection in the Project Team

3.4 Due to its multi-factorial nature, knowledge and understanding of HAI is not only necessary for Infection Control Specialists. There is a necessity for all staff involved in the procurement, design, construction and maintenance of the healthcare facility to be appropriately educated in prevention and control of infection. Training on prevention and control of infection of these groups is available from a variety of sources ranging from basic induction training (NHS Education for Scotland's Mandatory HAI Induction Training Framework and NHS Education for Scotland's Cleanliness Champions Programme), to more specialist training at Post-Graduate level.

3.5 Prevention and control of Healthcare Associated Infection is significantly increasing in profile within NHSScotland. The Ministerial Action Plan

'Preventing infections acquired while receiving healthcare' HDL(2002)82 sets out an Action Plan which is being undertaken by the HAI Task Force. Within the Action Plan there is reference to the promotion of good prevention and control of infection practice in wards, clinical settings and support services, emphasising that the work environment should be conducive to good prevention and control of infection practice and that environment and equipment standards must be maintained.

3.6 There are a variety of measures which contribute to the prevention of infection. However, despite every best effort, not all infections are preventable. Resources must be directed towards minimising the risk where infection can be prevented and facility design plays an important role in achieving this.

Importance of Infection Control input

3.7 Any project to build or refurbish healthcare facilities requires the involvement of a multi-disciplinary team from planning to completion and must include input from Infection Control Specialists throughout the project. The importance of a clean, safe environment should not be under-estimated as it will help ensure that:

- health and safety needs in terms of limiting the risk of infection of the occupants, healthcare workers and building contractors, are met during the project;
- the building design features will minimise the risk of transmission of infection;
- important design issues are considered at the project planning stage to avoid costly modification at a later stage.

3.8 Infection Control staff provide expertise and advice on the prevention and control of infection and as such play a pivotal role in ensuring other members of the Project Team are appropriately informed of any prevention and control of infection issues which may arise when:

- an initial site is being considered for development;
- the healthcare facility is being designed;
- the healthcare facility is being constructed or undergoing refurbishment;
- the healthcare facility is operational.

Examples of issues to be considered by the Project Team

3.9 Any disturbance of the environment caused by maintenance, demolition, construction and renovation presents a risk of infection to the occupants including:

- exposure to airborne micro-organisms such as *Aspergillus* spp;
- water entry and absorption into building materials leading to increased microbial contamination;

- access for insect pests and vermin;
- increased traffic through the facility;
- dust and debris in patient care areas and local/central decontamination units.

3.10 It is important to consider certain issues before construction work commences including:

- the type and extent of construction or renovation work;
- the likelihood of contamination to adjacent patient care areas;
- the impact on traffic for supplies e.g. sterile stock storage and delivery;
- the air flow and pressure differentials in the area (differentials may be varied by external wind strength and direction);
- the susceptibility of the occupants to infection e.g. through respiratory problems, immuno-compromised or intensive care patients;
- requirements for extra cleaning facilities.

3.11 Suitable efficient barriers may be required for dust control where work is to be carried out near patient areas. Examples of work include:

- demolition of walls, plaster and ceilings;
- removal of flooring, carpets, windows and doors;
- routine maintenance activities;
- any work with water which may aerosolise water droplets in high risk areas;
- exposure of ceiling voids;
- repairing water damage.

3.12 Transmission of micro-organisms with potential to cause infection requires three main elements:

- a susceptible host;
- reservoir of an infectious agent;
- an environment which allows the infection agent to colonise and possibly cause an infection in the susceptible host.

3.13 The risk of infection increases when micro-organisms exist in sufficient numbers in the environment and have the means of transmission to a susceptible host.

3.14 Implementation of effective prevention and control of infection measures reduce the risk of transmission by promoting an environment where risk of interaction between organism and susceptible host is minimised and this can be achieved by:

- proper design and maintenance of ventilation systems;

- designs which minimise accumulation of liquids in the airstream;
- designs which facilitate cleaning and good housekeeping;
- provision, where appropriate, of negative pressure ventilation;
- provision of adequate hand-hygiene facilities;
- provision, where appropriate, of adequate decontamination facilities.

3.15 Standard precautions should be adopted at all times in the healthcare setting but on occasion, additional transmission based precautions such as isolation are required to protect other patients, particularly those who are susceptible, staff and visitors. In any care setting, provision for the following in building design will assist in reducing the risk of infection:

- easy access to hand-hygiene facilities;
- suitable ventilation;
- adequate space for storage and ease of movement for patients and staff;
- surfaces, furnishing and fittings which will minimise dust accumulation;
- surfaces, furnishing and fittings which can withstand recommended decontamination processes and which are cleanable;
- secure and prompt waste and laundry disposal.

Selection of multi-disciplinary team of specialists

3.16 There are a variety of contract agreements with regards to the Project Team involved in the development of the healthcare facility. Each facility should apply the type which is most suitable to them. Ideally, the Project Team will include specialists such as those described in paragraph 3.20. Project Team members should have the appropriate authority to make and action decisions with regard to infection prevention and control.

Assembling the Project Team

3.17 The Project Team should be assembled as soon as possible to ensure that an accurate design brief is developed. Regular meetings with stakeholders referred to in paragraph 3.20 to discuss design, tendering, build and commissioning will ensure the facility is functionally suitable and fit for purpose. Regular communication during the construction and commissioning stages should also ensure that prevention and control of infection risks are highlighted and subsequently eliminated or mitigated.

Selection of consultants

3.18 The main source of guidance for procurement of healthcare facilities in Scotland is PROCODE, produced by NHSScotland Property and Environment Forum. PROCODE gives guidance on the selection of consultants and is designed to compliment the Scottish Capital Investment Manual (SCIM).

3.19 Every consideration should be given to the quality of composition of the Design Team, including client representatives. Selection of Design Teams entirely, or primarily, on cost is contrary to public sector procurement requirements which demand a best value approach. The quality of the Design Team, including knowledge and understanding of healthcare associated infection, should be a key criteria in the selection of the Design Team. The design brief and/or output specification are critical in achieving a high quality environment.

Roles and responsibilities

3.20 Communication between all parties is paramount in order to ensure that prevention and control of infection risks are highlighted and then either eliminated or managed. The quality of the healthcare facility design and the subsequent tendering and construction phase will be enhanced if all potential risks and interactions with other services are fully examined and discussed as early in the process as practicable. This can be achieved if there is frequent communication and continuous co-operation between the Design Team and the successful Contractor during each stage of the healthcare facility development. Such participation can ensure that prevention and control of infection issues can be controlled promptly and effectively.

3.21 Demonstration of the decision making process e.g. minutes or project evaluation and records of significant decisions should be kept.

Representatives on Project Team

3.22 To ensure all infection issues are highlighted, input is needed from a wide variety of sources. The following list highlights some of the groups which need to be represented; each member of the Project Team must be competent in their designated area.

a) **Project Director**

Responsible for creation and management of the Project Team for delivery of a system which minimises infection in both the construction of operation of the facility.

b) **Client/Department representative**

To represent ward, department or work area. Required to represent end users to ensure the facility will be functionally suitable and fit for purpose.

c) **Infection Control Specialists - representatives from the Infection Control Team**

To ensure prevention and control of infection issues are considered at the planning stage, particularly where work may impact on existing services during the construction phase. Incorporate best practice into the final design and to review post occupancy.

Infection Control may also advise on cleaning and decontamination regimes to be operated post occupancy and to give input in areas such as storage space requirements or clean/dirty workflows.

d) **Design Team (to include Architects, Services Consultants, Planning Supervisor and Clerks of Works)**

To seek the advice of all the relevant professionals and incorporate their views into the final design of the healthcare facility. The Planning Supervisor, in accordance with the Construction, Design and Management Regulations (CDM), has the responsibility to review the Contractor's proposed project programme and advise the Client whether the works can commence. Throughout the project, the Contractor should provide method statements for discussion with the Planning Supervisor and Design Team before any significant elements of work are undertaken, records of which must be kept.

e) **Facilities services**

Depending on the management arrangements, the following functions may need to be represented. This list is not exhaustive and other groups should be consulted as needed.

i. Infection Control Manager;
ii. Domestic;
iii. Waste;
iv. Estates;
v. Catering;
vi. Portering;
vii. Security;
viii. Fire;
ix. Procurement;
x. Sterile services;
xi. Linen and laundry services

Information from these can be used to inform the Design Team and to amend existing schedules before and during the construction phase.

f) **Contractor**

To work with the Design Team to provide a manageable programme of works, ensuring that views of stakeholders and risks identified by the various stakeholders are effectively managed. This is subject to review by the Planning Supervisor (see paragraph 3.22 d) above – Design Team).

4. Importance of education

4.1 Due to HAIs multi-factorial nature, education is not only necessary for Infection Control Specialists. There is a necessity that staff involved in the procurement, design, construction and maintenance of the healthcare facility should be appropriately educated in prevention and control of infection and should be able to demonstrate their knowledge and understanding of the area.

4.2 The nature of the issue means that both the clinical and non-clinical environment are affected. An environment which is designed to be fit for purpose, which limits the risk of infection spread by incorporating facilities, design features and fabrics that facilitates the promotion of standard precautions e.g. hand-hygiene, cleaning, disinfection, decontamination, patient isolation/segregation and waste disposal facilities is therefore essential.

4.3 Training on prevention and control of infection for these groups of staff is available from a variety of sources, and ranges from basic mandatory induction training to more specialist training at Post-Graduate level. An HAI module aimed specifically at these groups of staff has been incorporated into Glasgow Caledonian University's MSc Healthcare Property and Facilities Management. The module is also available outwith the MSc as a continuing professional development course.

4.4 One of the key priorities outlined in the Ministerial Action Plan 'Preventing infections acquired while receiving healthcare' HDL(2002)82, was the introduction of mandatory induction training on HAI for healthcare workers. Based on the principle that the greater number of healthcare workers with direct or indirect patient contact who have an understanding of the Standard Infection Control Precautions, the greater the chance of promoting high personal standards and behaviours, and reducing the prevalence of HAI within NHSScotland.

4.5 NHS Education for Scotland (NES) has developed a multidisciplinary prevention and control of infection educational programme entitled 'The Cleanliness Champion'. The programme is designed for staff with direct patient contact, and introduces the concept of standard precautions being applied at all levels of care to protect patients and staff from infection risk. Further information on training on HAI can be found at www.nes-hai.info/.

5. Risk management

5.1 Risk management involves three stages:

1. Identifying risk.
2. Assessing risk.
3. Managing the identified risk by elimination or by using controls to reduce the severity of risk.

Identifying risk

5.2 The time taken to plan or refurbish a healthcare facility can vary from a relatively short period in the case of urgent renovation, to as long as three or four years for a major capital build project. It is therefore important that Infection Control Teams are notified of capital bids or contracts given to Architects at the earliest opportunity. The Infection Control Team need to be involved in the first planning meetings. Most meetings thereafter will require some input from them.

5.3 To avoid mistakes and pitfalls the Project Team must consider issues including:

- How will the product, equipment, room or clinic be used?
- What possible solutions are available?
- What are the budgetary limitations?
- Which prevention and control of infection principles or external regulations apply?
- What does the evidence suggest in relation to the specific context?
- What are the laws governing the project?
- What are the standards and guidelines from architectural and engineering bodies, government departments and accrediting agencies?
- Which product or design best balances the infection control requirements with employee and patient safety and satisfaction, and cost constraints? (Carter and Barr, 1997.)

Common pitfalls

5.4 Common pitfalls arise from a number of pressures, for example, the pressure to choose the cheapest products or design. As many authors have argued, the best products or designs may be more expensive initially but in the long term they will probably realise cost benefits as they may prevent outbreaks, or they may last longer and require less maintenance and be more durable.

Common errors

5.5 Common errors in design and construction (adapted from Carter and Barr, 1997) due to inept or non-existent risk management include:

- air intakes placed too close to exhausts or other mistakes in the placement of air intakes;
- incorrect air turnover and airflow patterns;
- air-handling systems which function only during the week or on particular days of the week;
- ventilation systems which are not fully commissioned;
- negative air-pressure rooms being omitted from large, new inpatient buildings;
- carpet placed where vinyl should be used;
- aerators on taps (also avoid swan-neck outlets where possible);
- sinks located in inaccessible places;
- patient rooms or treatment rooms which do not have sinks in which healthcare workers and visitors can wash their hands;
- doors too narrow to allow beds and equipment to be moved in and out of rooms;
- inadequate space to allow safe use of medical devices and equipment.

5.6 Carter and Barr reported these errors they had encountered during construction projects in their practice of prevention and control of infection. They recommended that Infection Control personnel inspect the construction site frequently to make sure the workers are following the correct guidance.

Assessing risk

5.7 Outbreaks of infection have been related to the design, plan, layout, function and/or finish of the built environment (Cotterill et al, 1996; Kumari et al, 1998). Thus, risk assessment is a fundamental imperative in the planning and design stages of a healthcare facility, yet it is often overlooked or compromised throughout the lifecycle of the project. Disseminating good specialist knowledge and involving Infection Control Teams throughout all phases of construction and renovation projects will reduce risks. Failure to properly assess prevention and control of infection risk can lead to expensive redesign later and expose the patient and healthcare worker to prevention and control of infection hazards.

Managing the risk

5.8 Part of the Infection Control Team's role is to help non-clinical professionals to understand the main principles of how infection is spread in the context of the built environment.

5.9 When evaluating the spread of infection and its control, three aspects should be considered:

- source;
- mode of transmission; and
- susceptible recipient.

These principles should be applied to all stages of the development of the healthcare facility.

Source

5.10 Building professionals must be convinced about the risks associated with construction projects, and that the environment can be a reservoir for potentially infectious agents. The source is the person, animal, object or substance from which an infectious agent is transmitted to a host. The immediate healthcare environment can be a potential reservoir of micro-organisms and source of infection or contamination, therefore, Designers and Planners need to consider eliminating potential sources of infection by practising good design, for example:

- storage facilities;
- choice of materials, avoiding unnecessary surfaces that may become reservoirs for infectious agents;
- ensuring materials and surfaces can be cleaned and maintained.

5.11 It has been reported (Rampling et al, 2001) that antibiotic-resistant bacteria, such as meticillin-resistant *Staphylococcus aureus* (MRSA), may survive and persist in the environment leading to recurrent outbreaks.

5.12 Attention to prevention of airborne infection by the use of ventilation in specialised areas and correct engineering and mechanical services contribute greatly to reducing potential reservoirs of infection in the built environment.

5.13 Elimination of other environmental sources of infection, for example pests, litter, insects, birds, small mammals and waste, should be considered at the outset of a project and reviewed throughout. Common pests include rats, mice, ants, cockroaches, pigeons and flies. All carry micro-organisms on their bodies and in their droppings. Healthcare facility hygiene is dependent on controlling pests.

Mode of transmission

5.14 A basic understanding of modes of transmission of infection assists in promoting joint responsibility for prevention and control of infection. Micro-organisms can be transmitted in three main ways:

- **direct** transmission involving direct transfer of micro-organisms to the skin or mucous membranes by direct contact;

- **indirect** transmission involving an intermediate stage between the source of infection and the individual, for example infected food, water or vector-borne transmission by insects;
- **airborne** transmission involving inhalation of aerosols containing micro-organisms, for example legionnaires disease or tuberculosis.

5.15 Environmental dispersal of micro-organisms during construction, resulting in HAIs, should also be emphasised to non-clinical members of the project teams.

5.16 There is a need to assess the infection risks during construction and how construction activity itself may be a mechanism for dissemination of infection; for example, environmental airborne contaminants and infectious agents are closely related to water and moist conditions which feature prominently in construction activity.

Susceptible recipient

5.17 Preventing transmission of infectious agents to vulnerable patient populations, healthcare workers and visitors is an important component of prevention and control of infection programmes.

5.18 Outbreaks of infection, affecting immuno-compromised patients, have been reported, and construction professionals need to understand the concept of the at-risk patient. Some groups of patients are especially susceptible to certain infectious agents to which they may be exposed in the healthcare construction environment.

Conclusion

5.19 The integration of prevention and control of infection risk management and construction is in its infancy. It represents a significant change in the management of healthcare facilities design and planning which will take time to develop to a level at which the greatest benefits can be achieved. Just as important then is the need to carry out research in the area of risk management, prevention and control of infection and the built environment to produce sound irrefutable evidence on which to base further risk management strategies.

Important

- always consult the Infection Control Team at an early stage:
  - whenever refitting or refurbishment is planned;
  - whenever major capital bids are planned;
- do not wait until patients are ready to move in;
- do not wait until fixtures, fittings and furnishings have been purchased;
- do not let cost or space consideration override reason;
- most advice will be commonsense but not always popular financially.

6. Legislative issues

Health and safety

6.1 Due to the complexity of the process of developing a new healthcare facility, there is a great scope for errors and omissions which can affect the delivered facility in terms of its ability to contribute to, or at least limit the spread of infection.

6.2 HAI is a health and safety issue and the actions or omissions of those involved in the provision or operation of the facility could become evidence in any legal action stemming from an infection. For this reason it is essential that, as with other considerations of professional competence, all those involved in the commissioning, procurement, design and planning and construction refurbishment or ongoing maintenance are able to demonstrate that appropriate expertise was in place and advice sought.

6.3 A number of pieces of legislation put the primary responsibility for the safety of the facility, including HAI, on the employer, usually the NHS Board. In construction procurement the 'employer' sets the resource, assesses the competence of the Design Team and evaluates the output. This means the employer should lead on setting the quality culture that will deliver a safe environment.

Health and Safety legislation and prevention and control of infection

6.4 It is important to remember that many of the recommendations in this guidance, while evidence based, may also be required by Health and Safety law in respect of controlling the risk of infection to staff and patients. This needs to be taken into account during the process of planning, designing and maintaining healthcare premises, as this will clearly influence the final outcome. The following outlines some of the key features of relevant legislation which impinge on the control of infection. Other relevant legislation may also be applicable.

Health and Safety at Work etc Act 1974

6.5 The duties of employers under the Health and Safety at Work etc Act 1974, including protecting the health, safety and welfare of employees, extends to patients and others who may be affected by any work – this includes control of infection measures.

The Provision and Use of Work Equipment Regulations (PUWER) 1998

6.6 Anyone involved in the supply of equipment, plant or machinery for use at work has to make sure that, as far as is reasonably practicable, it is safe and does not cause any risk to health when used at work.

For example:

- equipment should be made of materials that can easily be cleaned and which do not support microbial growth;
- plant or equipment which needs regular cleaning should be easy to access and easy to dismantle.

The Construction (Design and Management) Regulations 1994 (CDM) (as amended 2000)

6.7 These Regulations require that health and safety is taken into account and managed throughout all stages of a project, from conception, design and planning through to site work and subsequent maintenance and repair of the structure. These Regulations apply to most common building, civil engineering and engineering construction work (including demolition, dismantling and refurbishment).

6.8 The NHS Board has Client responsibilities under these Regulations; it has to pass relevant reasonably available information about health and safety matters which relate to the project to those who are responsible for planning the project.

6.9 The CDM Regulations state that Planning Supervisors have responsibility to review the Contractor's proposed project programme and advise the Client whether the works can commence.

The CDM Regulations also state that Designers should:

- ensure that when they design for construction they assess the foreseeable health and safety risks during construction as well as the eventual maintenance and cleaning of the facility in the balance with other design considerations such as aesthetics and cost. This can be achieved by applying the normal hierarchy of risk control;
- identify all the hazards inherent in carrying out the construction work and, where possible, alter the design to avoid them. If the hazards cannot be removed by changing the design, then the risks will need to be controlled and the designer should provide information about the remaining risks.

The Control of Substances Hazardous to Health (COSHH) Regulations 1999

6.10 COSHH provides a framework for controlling the risks from most hazardous substances, including biological agents, which can contribute to the risk of infection.

6.11 COSHH requires that employers assess the risk from all infectious agents to both their employees and others who may be affected by their work, for example patients. The assessment needs to be suitable and sufficient and must cover the steps that need to be taken to meet the requirements of the rest of the Regulations. This means that the assessment should also review the use of control strategies, the maintenance and use of control measures such as air

handling systems and air filtration, health surveillance requirements and, perhaps most importantly, information, instruction and training for employees.

6.13 There are a number of general measures in COSHH relating to the control of exposure to biological agents which must be applied in the light of the results of the assessment. Other procedural/management control measures must also be applied if employers are to fully meet their duties under COSHH including:

- keeping as low as practicable the number of employees exposed or likely to be exposed to biological agents;
- designing work processes and engineering control measures so as to prevent or minimise the release of biological agents into the place of work;
- displaying a biohazard sign and other relevant warning signs;
- drawing up plans to deal with accidents involving biological agents;
- specifying appropriate decontamination and disinfection procedures;
- instituting means for the safe collection, storage and disposal of contaminated waste, including the use of secure and identifiable containers, after suitable treatment where appropriate;
- making arrangements for the safe handling and transport of biological agents, or materials that may contain such agents, within the workplace;
- specifying procedures for taking, handling and processing samples that may contain biological agents;
- providing collective protection measures and, where exposure cannot be adequately controlled by other means, individual protection measures including, in particular, the supply of appropriate protective clothing or other special clothing;
- where appropriate, making available effective vaccines for those employees who are not already immune to the biological agent to which they are exposed or liable to be exposed;
- instituting hygiene measures compatible with the aim of preventing or reducing the accidental transfer or release of a biological agent from the workplace including in particular, the provision of appropriate and adequate washing and toilet facilities and the prohibition of eating, drinking, smoking and application of cosmetics in working areas where there is a risk of contamination by biological agents.

6.14 'Appropriate' in relation to clothing and hygiene measures means appropriate for the risks involved and the conditions at the workplace where exposure to the risk may occur.

7. Procurement and construction process

Overview

7.1 The procurement and construction of a healthcare facility is a highly complicated process and requires input from a wide variety of sources. During the procurement and construction process, reference should be made to existing guidance relating to the procurement and construction of healthcare facilities such as that contained in the Scottish Executive Health Department's Scottish Capital Investment Manual (SCIM).

7.2 Infection Control Specialist input is essential in relation to procurement at the design and planning stage of a project. There is a case for stipulating that Architects and Designers for healthcare projects should be able to demonstrate their knowledge and understanding of prevention and control of infection.

7.3 The specification of building materials, especially surface finishes, healthcare facility equipment etc should take account of the input from the Infection Control Specialist.

7.4 The Scottish Capital Investment Manual (SCIM) comprises a number of guidance booklets covering the following areas:

- Overview;
- Project Organisation and Management;
- Private Finance Guide;
- Business Case Guide;
- Management of Construction Projects;
- Commissioning a Healthcare Facility;
- Information Management and Technology Guide;
- Post Project Evaluation.

7.5 Other sources of information which should be consulted include NHSScotland Property and Environment Forum's procurement guidance PROCODE which provides an insight into the contracting aspects of health building projects, including the implementation of national policy and EU directives. PROCODE provides guidance on a wide range of procurement issues including the appointment of Works Contractors and Consultants and the use of various forms of contract.

7.6 Prevention and control of infection issues associated with procurement and construction need to be given appropriate priority and consideration. Recommendations and the incorporation of recommendations should be documented. It is therefore essential that the advice of Infection Control Specialists should be sought as a routine feature of the procurement and construction process and HAI-SCRIBE should be applied at the appropriate

stages of procurement and construction. The involvement of Infection Control Specialists and the application of HAI-SCRIBE is not restricted to certain levels of project expenditure but rather is applicable to all procurement and construction processes.

7.7 Health and safety considerations are an important feature at this stage and at least some of the health and safety considerations will influence final outcome in terms of prevention and control of infection. The duty of employers to protect employees also extends to patients and others who may be affected by inappropriate prevention and control of infection measures.

8. Evaluation of site for development

8.1 Due to the complexity of the management of HAI, especially in relation to the built environment, input from a wide variety of sources is necessary for success.

Selection of multi-disciplinary team of specialists for implementation of HAI-SCRIBE

8.2 HAI-SCRIBE aims to manage infection risks through the development of a prevention and control of infection questionnaire. The system highlights the need for a multi-disciplinary team of specialists with appropriate skills to ensure its implementation. This is an essential requirement in terms of the evaluation of the site for development. Inappropriate decisions, or a less than rigorous investigation of the site, may well result in infection problems being identified at a later stage when it may be very difficult or indeed impossible to remedy the situation. Remediation of the situation may also prove expensive and investment at this stage may pay dividends over the life of the facility.

8.3 The multi-disciplinary team of specialists may include, amongst others:

- an Architect;
- a Building Services Engineer;
- an Infection Control Specialist with experience/knowledge of the built environment;
- a Risk Manager;
- an Estates/Facilities Manager.

Record of decision-making

8.4 A record of significant decision-making should be maintained. Such a record is evidence of 'due diligence' and helps to ensure that prevention and control of infection issues are implemented. Good practice requires implementation of a risk management system such as HAI-SCRIBE, this being an accurate record of the process of hazard assessment and risk management. Signing off by the Infection Control Specialist at each stage of the development, including this stage of the evaluation of the site, should be considered an essential step.

Pollution/contamination

8.5 Pollution from external sources can contribute to the spread of infection within the built environment (e.g. ingress of *Aspergillus* spores or *Legionella* bacteria during earthworks). Limitation of external pollution can go some way to controlling the spread of infection within the built environment.

8.6 HAI-SCRIBE highlights in its question sets, the potential for infection risk when consideration is being given to a proposed site for development. Research into the history of the area being proposed for development, together with a rigorous

examination of existing industries and businesses, will highlight any potential for infection risk and the measures which may be appropriate to manage the infection risk. Failure to be rigorous in relation to the historical research of the area and the examination of existing industries in the area may result in infection risks not being identified until it is too late to effectively manage them. Specialist external advice is likely to be necessary.

8.7 There are other pollution/contamination issues which may also need to be identified and addressed, even if these are not infection risks e.g. land contaminated by chemicals, asbestos etc.

Topography of site

8.8 When considering the topography of the proposed site for development, issues such as the prevailing wind direction and the associated prevention and control of infection issues need consideration.

8.9 For example, the positioning of the healthcare development in relation to cooling towers in the area and the potential infection risk from entrainment of vapour plumes containing *legionella.*

Implication of choosing natural ventilation

8.10 Adequate ventilation in healthcare facilities is essential for fresh air supply, odour dilution and the removal of airborne contamination.

8.11 In relation to evaluation of a site for development, consideration should be given to how the foreseeable conditions of the site will affect the performance of the ventilation system chosen.

8.12 In areas where the functioning of the ventilation system is critical to the minimisation of HAI risks, a mechanical ventilation system is most likely to be appropriate. The possibility for contaminants to be introduced in the fresh air supply from sources such as earthworks or cooling towers should be considered.

8.13 Where ‘natural’ ventilation is considered, this falls into two broad categories; controlled and uncontrolled. Uncontrolled ‘natural’ ventilation is most frequently seen as opening windows. Its performance is not predictable and as such, it is inappropriate as a strategy for ventilation in areas where controlled conditions are required. Uncontrolled natural ventilation allows contaminants such as fungal spores to be introduced to the ventilated space in untreated air when windows are open. Conversely, when windows are closed, dilution of contaminants in the ventilated space will be greatly reduced.

8.14 Between these two extremes is controlled natural ventilation where the ventilation, whilst not provided through a conventional ducted ventilation system, is designed, engineered and maintained to provide predictable performance.

8.15 As such a system is likely to be more affected than a mechanical system by external influences such as weather conditions, its design will require specialist knowledge. This type of system may involve filtration of incoming air but will not generally involve other air treatment such as heating. The motive force for the air will often be the buoyancy of air at room temperature, however, this entails relatively low pressure differentials which will constrain the type of filtration used.

8.16 Although air-conditioning may seem a straight-forward solution to the control of the environment, it is expensive to run and not environmentally sustainable on a large scale. Within the working life of buildings being built now, restrictions in Carbon Dioxide emissions allowances are likely to preclude the routine use of air-conditioning. For this reason, sites which necessitate sealed, air-conditioned buildings should be avoided.

Impact of activities in the surrounding environment

8.17 Activities occurring in the surrounding environment can contribute to the spread of infection. For example, there may be construction/demolition works programmed in the neighbourhood which may present a risk e.g. fungal contamination arising from earthworks. Measures to limit these risks should be implemented.

Constraints of developing on a pre-determined site

8.18 In some cases the use of a particular site is unavoidable and in this case, steps must be taken to minimise any adverse conditions inherent on the site. HAI-SCRIBE highlights in its question sets the potential for infection risk arising from restraints on the development of a pre-determined site. For example, will lack of space limit the proposed development and any future expansion of the facility (e.g. to increase single room provision) and might this create or increase a risk of infection? Will the proposed development impact on the surrounding area in any way which may lead to restrictions being applied to the operation of the proposed facility which may in turn present potential for infection risk (e.g. storage and collection arrangements for healthcare waste).

Strategic planning

8.19 Infection Control Specialist input is essential at the strategic planning stage. It is never too early to have prevention and control of infection input.

8.20 To allow Infection Control Specialists to effectively participate in the planning process for both renovation and new-build projects, it is necessary for them to understand the process from its inception to completion.

8.21 A comprehensive approach to planning needs to include consultation with the appropriate specialists from inception through to post-project evaluation. The Project Team should include specialists as described in paragraph 3.20 of Section 3.

9. Design and planning stage

9.1 At the design and planning stage, it is crucial that hazards associated with infection risk should be identified and assessed, and measures taken to manage these risks. It is essential to 'design in' at the design and planning stage, measures which will eliminate or minimise the impact of identified hazards and effectively manage the risk of infection. Reference should be made to the question sets contained within HAI-SCRIBE.

Strategic planning and the role of prevention and control of infection

9.2 In the 'National Overview for Improving Clinical Care in Scotland: Healthcare Associated Infection (HAI); Infection Control', NHS Quality Improvement Scotland (QIS) prescribes that prevention and control of infection are considered as part of all service development activity. In the USA, the current authority for construction, design for federal and healthcare providers is the 2001 edition of 'Guidelines for Design and Construction of Hospital and Healthcare Facilities' published by the American Institute of Architects/Academy of Architecture for Health (2001) with assistance from the US Department of Health and Human Services; http://www.aia.org/aah_gd_hospcons The latest version strongly supports prevention and control of infection input at early planning and design stages.

9.3 For Infection Control Teams to effectively participate in the planning process for both renovation and new-build, it is necessary for them to understand the process from its inception to completion.

9.4 Where significant refurbishment is being considered, or the use of an existing patient facility is being planned, Infection Control Specialist input is essential at the strategic planning stage. It is never too early to have prevention and control of infection input.

9.5 To allow Infection Control Specialists to effectively participate in the planning process for both renovation and new-build projects, it is necessary for them to understand the process from its inception to completion.

9.6 The organisation of the Project Team involved in Strategic Planning is given in paragraph 3.22 of Section 3.

The planning process

9.7 The planning process, although refurbishment work may be different, is comprised of the following stages:

- the concept/feasibility study;
- sketch plans;
- the preparation of a business case to support the viability of the project;

- project funding;
- the design stage;
- project monitoring;
- commissioning the facility;
- post-project evaluation.

Table 2 highlights the infection control input required at each stage.

9.8 Its aim is to prompt those with overall responsibility for managing capital schemes or Private Finance Initiative/Public Private Partnerships (PFI/PPP) to include prevention and control of infection advice at the right time in order to prevent costly mistakes.

These points are expanded upon in more detail below.

Concept/feasibility study

9.9 The planning process starts with the identification of a 'need' by the users. The development of this need will involve feasibility studies to enable a design brief or output specification to be developed. The Infection Control Team should review operational policies and procedures at this stage and there may be 1/200 designs to give a broad overview of the scheme. The Infection Control Team needs to consider:

- the effect additional beds or departments will make to policies such as waste disposal, linen and catering, etc.;
- the effect of extra theatres on decontamination services, workflow, etc.;
- additional specialised areas that will probably require extra infection control and laboratory input as well as specialist advice which may not be available in-house e.g. bed space and size of departments, etc., plus engineering services needs such as ultra-clean ventilation, showers baths, etc.

Further details on this process can be found in Table 2.

Space planning

9.10 There are a number of issues in terms of design and layout which could contribute to the risk of transmission of micro-organisms. For example, the design of the ventilation system needs to inhibit contamination spread rather than contribute to it. The internal and external routes identified for removal of dirty laundry, waste food, healthcare waste, similarly need to be planned so as to inhibit rather than encourage contamination.

9.11 There should be adequate space within the healthcare facility for storage of consumables, for example, there should be adequate storage in theatres for small orthopaedic implants.

9.12 The location of departments, theatres, wards and rooms needs to take account of good prevention and control of infection practice and ensure that workflows are designed to inhibit infection spread.

9.13 It is very important that the design and layout of the healthcare facility should inhibit the spread of infection. Reference should be made to HAI-SCRIBE and its question sets in relation to this.

9.14 Workflow systems should facilitate travel from clean to dirty to clean but never back again to clean. This principle is important in terms of limiting infection spread.

9.15 Correct workflow systems must be maintained throughout the building project. Input from Infection Control Specialists is essential at the planning stage of the project, requiring close collaboration between Infection Control Specialists and the Design Team. This is especially important in the planning of specialised units, for example, theatres and critical care.

9.16 Most healthcare departments have clean-to-dirty area flow systems. Workflow is a basic element of good prevention and control of infection practice and this needs to be reflected when the built environment is being planned.

Sketch plans

9.17 The remaining 1/200 designs will be available at this stage and the Infection Control Team needs to give a broad view of prevention and control of infection issues such as:

- missing rooms;
- wards without ancillary areas.

Additional considerations at this point will include:

- storage;
- ancillary areas;
- single rooms;
- isolation rooms;
- changing facilities;
- lifts;
- pneumatic delivery systems.

The business case

Outline business case

9.18 The preparation of a business case is the process that supports NHS Board submissions for funding of new capital projects. A business case must convincingly demonstrate that the project is economically sound, is financially

viable (affordable to the NHS Board and purchasers) and will be well managed. In addition, a business case for any investment should show that it will benefit patients. An overview of the capital investment process is given in the Scottish Capital Investment Manual (SCIM).

9.19 The involvement and support of a wide range of managers and staff is vital to the success of the business case, both to determine the requirement and scope of the investment and also to participate in subsequent stages of planning. It is important therefore at this stage to identify and involve key people who have a direct interest in the end product. This will include members of the Infection Control Team along with other leading clinicians, nursing managers and departmental heads. Specifically at this stage, Infection Control Teams need to:

- establish the goals of prevention and control of infection. What prevention and control of infection risks are especially important for each specific context;
- agree the agenda for prevention and control of infection design and planning;
- communicate prevention and control of infection imperatives throughout the course of the project, but especially at the initial stages;
- monitor the progress of the building/refurbishment project in relation to compliance with infection control specifications;
- determine available resources that can be used and recognise the cost benefits of not cutting corners on prevention and control of infection issues.

9.20 Normally the input from the Project Team should be managed by the Project Director. For larger and more complex schemes, a Project Manager reporting to the Project Director may be appointed to conduct the detailed work and manage the Project Team.

Issues to be addressed by the Infection Control Team

9.21 The Infection Control Team must ensure that prevention and control of infection implications are not compromised by reducing or overcrowding in clinical areas. The issues frequently addressed will include costs and space constraints which will impact on areas such as:

- storage and equipment cleaning areas;
- ventilation;
- hand hygiene facilities;
- furnishing;
- appropriate finishes;
- isolation rooms/rooms used to segregate patients;
- specific products with infectious implications;
- applicable regulations;

- domestic services room.

Detail planning

9.22 It is at this stage, when the outline business case is presented, that the 1/50 designs will be available. There will probably be two stages to the consultation process:

1. Early on in this period the Infection Control Team will need to discuss location of rooms for correct workflow/prevention and control of infection practice, i.e. wards, theatres and patient passage through out-patients or primary care facilities, etc.
2. Later there will be a need to discuss the finer details such as where fixtures and fittings are located, what type of flooring, cupboards or storage systems are to be used, and ventilation in theatres, etc.

9.23 The Infection Control Team will also need to think about the prevention and control of infection issues around:

- workflow;
- hand-wash basins: types, numbers and location;
- fixtures/fittings/flooring;
- wastewater and sewage/body fluid disposal;
- ventilation;
- heating and lighting;
- water systems;
- suction/medical gases;
- storage systems;
- ward kitchens/pantry.

9.24 The business case process should highlight the variables that drive the facility's requirements with regard to prevention and control of infection. This is not always an easy task in the initial stages of a project. Table 4 gives a range of initial ideas.

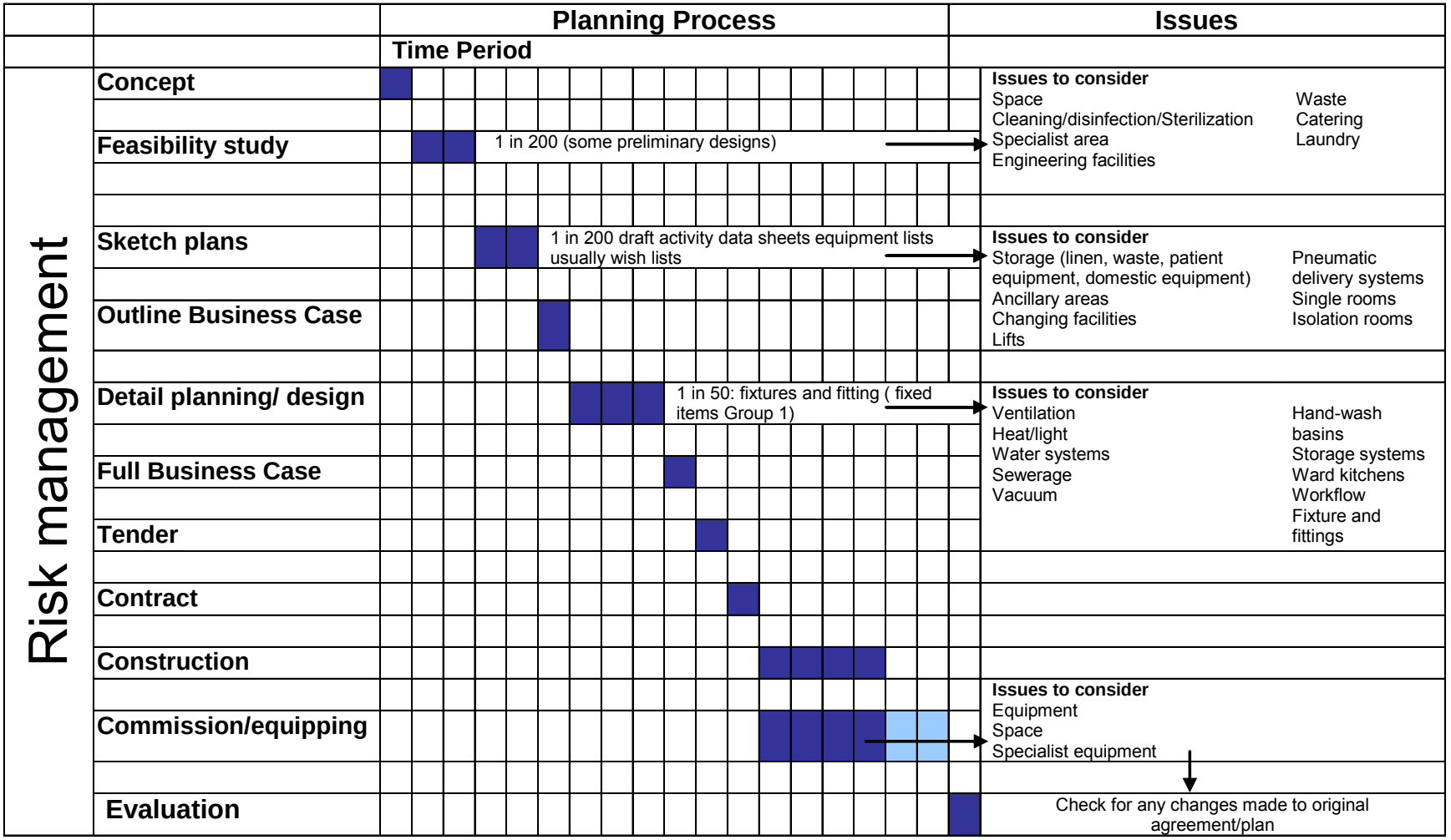

Table 2: Project Development Chart

Typical Stages of Infection Control Input

1. **Concept/feasibility study:** Infection Control Team should review operational policies and procedures, e.g. 1/200 plans.

   Adding beds to ward area may mean extra sluice or side rooms.

   Adding extra theatres will need a review of decontamination services for instruments.

   Additional specialised areas will need extra prevention and control of infection input.

2. **Sketch plans:** at this stage, the Infection Control Team needs to give a broad view of prevention and control of infection issues e.g. rooms missing, wards without ancillary areas such as disposal rooms or dirty utility.

3. **Detail planning/design:** (1/50 designs – early period)

   There is a need to finalise locations of rooms for correct workflows/prevention and control of infection practice, i.e. wards, theatres.

4. **Detail planning/design:** (1/50 designs – later period)

   Need to discuss finer details within rooms: location and type of fixtures and fittings, e.g. hand-wash basins/types of basins; airflows in theatres, flooring.

5. **Construction:** the Infection Control Team will need input here, particularly if the new build is attached to an existing healthcare building, to prevent risks to patients.

6. **Equipment:** decisions on equipment should be made as an ongoing process, but it is at this stage that it will be seen that previous equipment 'wish-lists' may not fit the rooms/departments or are now outdated. It is important that Infection Control Teams have input during this period (especially if it is a PFI/PPP build).

7. **Commission/equipping:** Infection Control Teams must have input during this stage if costly and dangerous mistakes are to be avoided.

8. **Evaluation:** this is an important stage in which lessons learnt can be highlighted for future projects, both within NHS Boards and throughout NHSScotland. Post-project evaluation is mandatory and results should be available to other Boards.

Table 3: The Key Stages of the Planning Process and examples of Infection Control input

Accommodation areas/internal environment/general services	Examples: Key issues and areas to be considered
Accommodation areas	
Bed areas: • Single-bed rooms	En-suite facilities.
• 4-bedded bays versus 6-bedded bays	• Doors on bays • En-suite facilities
Dirty utility/clean utility	Standardisation of rooms/ choice of equipment e.g. bed pan vs macerator. Space.
Workflow/layout	Standard ward area versus specialised area.
Bed Planning	Elective. Emergency.
Linen services and facilities	Internal laundry versus commercial laundry.
Catering/kitchen areas	Furnishing, fixtures and fittings plus workflow crucial for HACCP. Commercial systems e.g. cook-chill versus in-house systems.
ITU/HDU	Single rooms versus 4/6 bed bays.
Handwash basins	1 to 2 versus 1 to 4 versus 1 to 6 dependent on room types. Facilities to ensure compliance with hand hygiene guidance: sinks, taps, soap, gloves, aprons. Easily accessible for staff use.
Staff change areas/storage of uniforms	Type of uniform provided will dictate, i.e. 'greens' versus classic.
Decontamination facilities. CDU/LDU	Operational policy dictated by choice of decontamination strategy
Equipment	Bed/mattresses. Purchase versus hire. Endoscopes/instruments. Cleaning/disinfection requirement. Patient specific. Enough equipment available.
Priority areas	
• Critical care • UCV Theatres • Hydrotherapy • Mortuaries • SCBUs and maternity • Renal units • Oncology • Neurology • Paediatrics • Decontamination units • Pharmacy aseptic dispensary	Every specialist area will have different requirements and infection control issues so cannot be planned as standard departments.
Internal Environment	
Ventilation	Single rooms, bays, theatres, pacing rooms, treatment rooms, internal sanitary areas. Negative and positive pressure isolation rooms.
Heating/ventilation	Dust-free options, i.e. hidden heat panels versus radiators.
Lighting	Quantity. The use of sealed units.
Furnishings, fittings and artwork	Walls/floors/ceilings – hygiene versus aesthetics.
Water	Deadlegs. Water turnover. Appropriate temperature for hot and cold systems. Water coolers/fountains.
General services	
Disposal of waste	In-house versus commercial. Storage.
Communications	IT systems (timely information on pathology, etc, operational policies, infection control policies, procedures and training).
Emergency plans	Water storage if water cut off/heating/medical gases and vacuum/suction/emergency generator, ventilation, etc.

Table 4: Infection control issues to consider in the Capital Planning Process. (Note: this is not an exhaustive list)

(Shaded boxes include examples of issues related to prevention and control of infection which might need to be considered.)
1. Set the strategic context:
• where are we now? • where do we want to be? • is it affordable?
• in-patient/day cases; • single room issues;
2. Define objectives and benefit criteria:
• facilities for patients with antibiotic resistant infections; • cost benefits of preventing healthcare associated infection.
3. Generate options.
4. Measure the benefits.
5. Identify/quantify costs.
6. Assess sensitivity to risk.
7. Identify the preferred option.
8. Present the outline business case.
9. Develop the preferred option: full business case.

Table 5: Typical steps in the business case process.

The HAI implications associated with using private finance

Dealing with HAI in PFI/PPP Projects

9.25 The Scottish Executive Health Department encourages the consideration of the strengths of the private sector and the use of privately raised capital. There are essentially two broad criteria against which all schemes are assessed: 'value for money' and 'assumption of risk'. NHS Boards are expected to explore the private finance alternative whenever a capital investment scheme is being considered. The goals of PFI/PPP are to:

- achieve objectives and deliver services more effectively;
- use public money more efficiently;
- respond positively to private sector ideas;
- increase competition.

Key factors in PFI/PPP

9.26 The contract between the NHS and the private sector supplier is critical and it is important that the service representatives/key stakeholders, and particularly in this instance, the Infection Control Team are clear about the options available and the evidence to back up any decisions they advise on. The Infection Control Team will need to make sure that certain criteria are embedded into the contract in such a way that important decisions on design or build do not go ahead without being 'signed off' by them. They should ensure that they have:

- access to all relevant and up-to-date plans and information on operational policies;
- access to any meetings deemed relevant to them or timely minutes from those meetings that they cannot attend;
- access to sites and departments as building work progresses, e.g. environmental rounds with checklists based on project objectives;
- regular communication between both internal Project Manager and the PFI/PPP team;
- involvement in decision making for any category of equipment the PFI/PPP team will purchase;
- involvement in any contracts for support services such as catering, cleaning, linen, decontamination unit, etc., that the PFI/PPP team may be providing;
- access to certain high risk areas for any microbiological testing deemed necessary, e.g. theatres, isolation/segregation rooms, pharmacy and decontamination unit, clean rooms;
- responsibility for HAI and actions to be taken, such as testing and remedial works, and that these terms are clearly specified in the contract.

Design stage

9.27 It is at the design stage that Infection Control Teams will need to follow up any input they have had in the initial brief. Sketch plans should be available to them to explain how the brief fulfils their requirements at the 1/200 and 1/50 plan stages of the project. Suggestions for improvement in operability are encouraged at this stage. (For an approximate time-scale, see Table 2.)

9.28 Consideration should also be given to the impact on existing local facilities, e.g. ventilation, water supplies, etc.

Design and structure issues

9.29 The Infection Control Team will need to consider:

- if the facility is designed to support prevention and control of infection practice;

- design, number and type of isolation rooms (i.e. source or protective environments);
- heating, ventilation, and air-conditioning systems including filtration;
- mechanical systems involving water supply and plumbing;
- number, type and placement of hand-hygiene fixtures, clinical sinks, dispensers for soap, alcohol hand-rub, paper towels, and lotion;
- sharps disposal unit placement;
- accommodation for Personal Protective Equipment;
- surfaces: ceiling tiles, walls, counters, floor covering and furnishings;
- utility rooms: soiled, clean, holding, workrooms;
- storage of movable and modular equipment;
- clinical waste;
- linen (clean)/laundry (used);
- storage of used medical devices prior to transfer to CDU and storage for sterile medical devices.

Adapted from Bartley (2000).

9.30 Equipment schedules for Groups 2 and 3 based on room data sheets/layouts are prepared at this stage. (Further information can be found in Appendix 1.) Items available for transfer should also be identified which will allow schedules for new equipment to be prepared and costed and considered for compatibility with existing equipment. This is an important area for input by the Infection Control Team if costly mistakes are not to be made. (Further information can be found in Appendix 1.)

9.31 The purchase of equipment for Groups 2 to 4 will not normally take place until the operational commissioning period. However, it is important during the construction and equipment supply stage that there is involvement by the Infection Control Team in discussion of Group 2 equipment. Some Group 2 equipment may require to be fitted by the main Contractor and all may have significant design implications. This will ensure that this equipment is compatible with prevention and control of infection needs and also that proper inspection and testing can be agreed. (Further information can be found in Appendix 1.)

9.32 Technical commissioning of the building, services and equipment should include any areas that require inspection and testing to demonstrate compliance with prevention and control of infection standards, i.e. theatres, hydrotherapy pools, isolation/segregation rooms and clean rooms in pharmacy and Central Decontamination Units (CDUs). There is a legal requirement for compliance in CDUs and pharmacies.

9.33 Commissioning of the building services is frequently curtailed to meet deadlines or put in the hands of inadequately qualified or experienced personnel. This is invariably to the detriment of user satisfaction, operational efficiency, HAI risk and running costs and should be avoided at all costs.

Tender/contract

9.34 The Infection Control Team should help review the tenders/contracts to assess the competence in relation to the technical nature of the build.

Monitoring the project

Construction (new build)

9.35 If the project is a new-build, monitoring will not normally be required by the Infection Control Team until the healthcare premises are at a stage when site visits can be arranged. Although Infection Control input is needed throughout the development of the healthcare facility, at this point it is important for the Infection Control Team to visit the site as soon as possible to familiarise themselves with the layout of the various departments. This will help them to detect any unidentified problems or ones caused by design changes.

Construction (new-build attached to existing site or refurbishment)

9.36 Infection Control Specialists agree that involvement of Infection Control Teams in refurbishment projects is important not only for ensuring that 'designed-in' prevention and control of infection is achieved, but also for assessing the potential risks to patients in existing buildings from dust, dirt and pathogens.

9.37 Measures that may limit the spread of dust, dirt and pathogens during construction include the following:

- undertake work in winter as the risk is lower for *Aspergillus* spp. and other fungal infections;
- clean and vacuum areas under construction and the surrounding areas frequently;
- place adhesive floor strips outside the door to the construction area to trap dust, these should be replaced regularly to remain effective;
- seal windows, doors and roof-space to control dust;
- wet-mop the area just outside the door to the construction area daily or more often if necessary;
- use a high-efficiency particulate air (HEPA) filtered vacuum to clean areas daily or more often if necessary e.g where there is a greater risk of infection spread or a greater need for control of infection;
- transport debris in containers with tightly fitting lids, or cover debris with a wet sheet;
- remove debris as it is created; do not let it accumulate. Use dust extraction equipment where feasible;

- remove debris through a window when construction occurs above the first floor;
- do not haul debris through patient-care areas;
- remove debris after normal work hours through an exit restricted to the construction personnel;
- designate an entrance, a lift and a hallway that the construction workers must use and which are not used by patients, visitors or healthcare workers;
- shampoo carpets when the construction project is completed;
- commission hotel services with regard to cleaning during construction projects.

(Adapted from Carter and Barr, 1997.)

9.38 There is a need to ensure that Infection Control Teams document advice given on building developments and that this advice is followed and recorded. Similarly, Carter and Barr (1997) advise that a daily checklist is maintained during the progress of the construction project (see Table 6 below).

Barriers	
Construction signs posted for the area	Yes/No
Doors properly closed and sealed	Yes/No
Floor area clean, no dust tracked	Yes/No
Air handling	
All windows closed behind barrier	Yes/No
Negative air at barrier entrance	Yes/No
Negative air machine running	Yes/No
Project area	
Debris removed in covered container daily	Yes/No
Trash in appropriate container	Yes/No
Routine cleaning done on job site	Yes/No
Traffic control	
Restricted to construction workers and necessary staff only	Yes/No
All doors and exits free of debris	Yes/No
Dress code	
Appropriate for the area (e.g., Theatres, CDU)	Yes/No
Required to enter	Yes/No
Required to leave	Yes/No

Table 6: Daily construction survey (Carter and Barr, 1997)

Surveillance and monitoring during renovation or construction work

9.39 Routine bacteriological sampling of floors, walls, surfaces and air is rarely indicated (Ayliffe et al, 2000), but there have been several documented outbreaks due to construction work. In 1995 there was widespread contamination of potable water with *Legionella pneumophila* during a period of major construction resulting in two fatal cases of healthcare associated *legionellosis* (Mermel et al., 1995). Multiple outbreaks of healthcare associated *aspergillosis* have also been described, including one specifically attributed to hospital renovation (Flynn et al., 1993). Mermel et al. (1995) suggest that heightened surveillance and preventive measures may be warranted during periods of excavation on hospital grounds or when potable water supplies are otherwise shut down and later depressurised.

9.40 NHS Estates (Wearmouth, 1999) advises:

"*Where vulnerable patients may be placed at risk, it is important that an appropriate risk assessment be carried out with the microbiologist/infection control officer [doctor] at an early stage in advance of any demolition works or disturbance/alterations to the building fabric/ventilation systems.*"

9.41 Since the airborne spores of *Aspergillus* spp. can travel significant distances, this will apply generally to all works in the immediate vicinity or within the boundary of the healthcare site. It is strongly advised that any recommendations by the Microbiologist/Infection Control Doctor should be incorporated into the building or engineering works so as to minimise risk.

9.42 Surveillance and monitoring during renovation or construction work may prove difficult; environmental assessment to detect *Aspergillus* spp. and to confirm epidemiological investigations may not be within the remit of all Infection Control Teams. However, implementation of adequate prevention and control of infection measures during construction are, and have been proven to be, an effective means of protecting highly susceptible or high risk patients from environmental contaminants (Thio *et al*., 2000).

Commissioning/equipping the healthcare facility

9.43 Upon completion of construction, the facility must be brought into use; the complexity of the task involved generally means that a Commissioning Manager and Commissioning Team will be needed. Senior managers, specialist teams and users should be fully involved in the process. The commissioning entails:

- drafting operational procedures;
- establishing baseline and future staffing profiles;
- establishing baseline and future revenue budgets;
- establishing final equipment requirements;
- identifying policy issues for referral to the Commissioning Team or the construction project team;

- identifying staff training needs;
- establishing the occupation programme for each user function, for incorporating into the overall masterplan.

9.44 Members of Infection Control Teams with an understanding of the commissioning process should ensure that they are included in any working groups in which infection prevention and control will have an impact, or in which requirements to modify services may have repercussions on other aspects of the prevention of infection.

9.45 The Infection Control Team may also need to be involved in processes for:

- transfer of facilities;
- phased or staged occupation;
- decorating;
- strategy for equipping;
- selection of equipment;
- storage and subsequent cleaning/disinfection of any furniture or equipment;
- commissioning hotel services for cleaning;
- site visits;
- artwork;
- furnishing and fittings;
- interior finishes and fixtures;
- post-handover period;
- decommissioning of redundant facilities;
- period of handover to operational management.

Post-project evaluation

9.46 The purpose of the post-project evaluation is to improve project appraisal, design, management and implementation. Although post-project evaluation is mandatory, it is a learning process and should not be seen as a means of allocating blame. There are three stages:

1. Project appraisal.
2. Monitoring and evaluation of project.
3. Review of project operations. It is at the third stage when it is useful for the Infection Control Team to be included in the evaluation teams that are reviewing project objectives. The outcomes (activity and its consequences) of the project will not be amenable to evaluation until the facility has been in use for some time.

Successful post project evaluation is aided by independence from the Procurement Team.

9.47 It is important that the project is evaluated in terms of its original objectives, not in light of any new legislation or development. Performance indicators may be used if these can be measured retrospectively. Control of infection related to measurable objectives may include:

- bed turnover;
- re-admission rates;
- incidence of day surgery;
- activity data;
- infection rates;
- patient satisfaction surveys, etc;
- process measures – air sampling, audit.

9.48 Reference should be made to HAI-SCRIBE and its question sets relating to the design and planning stage of any development.

Logistics

9.49 In addition to the issues raised in paragraph 9.10 'Space planning', the design of the healthcare facility must realistically consider the logistics of a functioning facility. It is essential that systems are in place which will inhibit the spread of infection and that resources and personnel are managed so they do not contribute to the risk of infection.

Examples of logistical issues to consider include:

- the delivery and distribution of materials and people via connecting corridors and lifts;
- the collection, transportation and storage pending removal or disposal of waste materials;
- clinical workflows.

9.50 These issues require careful planning and design which recognise the potential for infection spread through the mismanagement of such issues.

Sizing of space

9.51 At the time of writing this document, NHSScotland bed spacing requirements are under review. Bed spacing should be consistent with current guidance provided by NHSScotland Property and Environment Forum; Scottish Health Planning Note (SHPN) 04: 'In-patient accommodation: options for choice'.

9.52 There should be sufficient single rooms to prevent the spread of infection both to and from patients as a result of being 'housed' in open ward areas. Boards should audit use of single rooms to promote best use.

9.53 Initial planning and design in new builds needs to include numbers of beds and the appropriate space required between beds in accordance with the type of clinical intervention to be undertaken in the immediate patient environment.

9.54 Multiple beds in a single area should be kept to the minimum number possible, as this will assist in the prevention of cross-infection. Single rooms would appear to be the optimum solution, but other considerations such as cost and staffing levels may create pressure to reduce the proportion of single rooms.

9.55 Design, accessibility and space in patient areas all contribute to ease of cleaning and maintenance.

9.56 Spacing must take into account access to equipment around the bed and access for staff to hand-hygiene facilities. Sufficient space for equipment (e.g. hoists) is a health and safety issue for staff and patients.

9.57 Healthcare facilities must provide enough sanitary facilities and showers/bathrooms to ensure easy access, convenience and independence where possible.

9.58 Toilet facilities should be no more than 12m from the bed area or dayroom.

9.59 The work area around a patient needs to take account of the equipment which is nowadays routinely used in a healthcare facility and the patient space therefore needs to be sufficient to allow easy cleaning of that space and the equipment in it. Greater patient space may also reduce the risks of contact and airborne infection spread although the scientific evidence for this is limited. The design and planning needs to take account of current patient space guidance and the need to accommodate larger patients and patients requiring particular treatments/therapies and associated equipment.

9.60 Mode of transmission of infection should be taken into account when bed space and size of facility are being discussed. This includes direct transmission, indirect transmission via fomites (e.g. door handles, clothing, instruments, kidney dishes etc) and airborne transmission.

9.61 The principle should be to maintain sufficient space for activities to take place and to avoid transmission of organisms either by air or by contact with blood or body fluid or equipment. The exact space needed will vary according to numbers and activity of staff, type of patient, and environmental factors such as ventilation and humidity.

Particular issues for consideration include:

- patient groups;
- transmission of micro-organisms:
  - avoiding cross-infection;
  - the environment and its role in cross infection;
  - shared equipment;

- movement of patients.

- management of issues:
  - clinical pressures;
  - best use of single rooms;
  - avoiding unnecessary movement of patients between areas.

Bed density

9.62 With an increase in the prevalence of antibiotic–resistant bacteria and immuno-compromised in-patients, there is an increasing need for en-suite single rooms and negative or positive pressure isolation rooms.

9.63 Provision of isolation/single rooms used to segregate patients will help prevent the spread of micro-organisms, especially those transferred by the airborne route or those easily disseminated into the immediate patient environment.

9.64 The provision of adequate space around the bed can significantly improve the quality of the patient's experience and aid the clinical and healing process. Clinicians and carers need adequate space around the bed, arranged in a functionally suitable way, to undertake their work efficiently and safely, making the most effective use of resources. Facilities should also serve the psychological needs of patients and their families providing a place of safety and privacy.

Access for maintenance

9.65 Surfaces should be easy to clean and therefore should be free of internal corners, cracks, crevices etc. which would make cleaning more difficult.

Ducting of services helps to achieve easy cleaning of surfaces but it is important to have sufficient, suitably sited access points for maintenance of the ducted services. The planning and design stage of the project must identify the access points for ducted services and those must be accessible with minimal or no disruption to the building surfaces or to patients.

9.66 Cleaning and maintenance of the ducts themselves must also be easily achieved with minimal infection risk.

9.67 There should be no ducted services where easy access is not available. Access for maintenance must not inhibit the safe efficient normal operation of the ward or department.

Departmental issues

9.68 There are some departments in a healthcare facility where infection risk is higher. These should be situated so as not to further increase the risk of infection.

9.69 For example, inappropriate transferring of cleaning equipment to different areas may be combated by use of colour coded/clearly labelled zoned areas where movement of domestic staff and equipment is controlled by swipe cards. Departments with susceptible patients should be located and serviced to minimise risk of contamination from departments where patients are an infection risk.

Storage

9.70 Adequate storage should be provided for patients' possessions, sterile supplies, non-sterile supplies or for domestic services equipment and patient care equipment. This can help limit the spread of infection of frequently handled items, minimising contamination. Separate storage areas may be needed depending on the kind of item being stored.

9.71 Inadequate provision of storage facilities can mean that inappropriate sites e.g. corridors and clinical areas, are used for storage of equipment. This can lead to unnecessary contamination both of equipment and, subsequently, from equipment.

9.72 Storage of Personal Protective Equipment (PPE) and ready access to clean PPE is important to encourage its use. There should be appropriate clinical waste bins for disposal of PPE once worn.

Patients

9.73 Lockers and wardrobes are intended for the storage of patients' personal possessions and clothing. They should be made of an impervious material that is easy to clean with no crevices or corners where dust or debris could accumulate, resulting in a reservoir for infectious agents. They should also be sufficiently robust to withstand the prolonged use of recommended decontamination agents. The lockers should be provided with castors to allow easy access for daily cleaning and castors should also be cleaned. Deep cleaning of lockers is required on a routine basis to ensure all surfaces including the underside of the locker are free from spillages. Further guidance can be found in the NHSScotland National Cleaning Specification produced by the HAI Task Force.

Domestic Services Room

9.74 Domestic cleaning equipment and supplies must be stored in separate purpose built areas. There must be a dedicated domestic services room and store for the provision of such must be adhered to (further assistance can be found in SHPN 40: 'Common Activity Spaces'). There should be sufficient space in these areas to allow cleaning equipment to be thoroughly cleaned after use.

The areas are required to have:

- good ventilation;
- adequate space for domestic staff to clean and decontaminate small pieces of equipment and furniture e.g. domestic and clinical waste bins;

- adequately sized rooms to accommodate all activities taking place in the area;
- non-slip safety flooring fitted with coving between the floor and the wall to prevent accumulation of dust and dirt in corners and crevices;
- a large sink with fitted worktops and splashback and a lockable cupboard;
- a separate hand-wash basin fitted with a mixer tap but without a sink plug and fitted with dispensers for soap, alcohol gel, hand towels and handcream;
- foot operated waste bins;
- wall protection around the area where the domestic cleaning equipment is stored;
- adequate provision for the storage of supplies;
- a door stay and door lock.

Linen cupboard

9.75 Each ward should have an area for the storage of clean linen, which in new builds should be purpose designed. The areas used for the storage of clean linen should ensure that linen is not exposed to contaminants.

The areas are required to have:

- good ventilation;
- adequate lighting;
- impervious flooring that is easy to clean and fitted with coving between the floor and the wall to avoid accumulation of dust and dirt in corners and crevices;
- slatted shelving to ensure free flow of air.

9.76 If linen trolleys are used to store linen within the ward area, they should be managed so that:

- they are kept tidy and closed to ensure that linen is not exposed to dust;
- linen bags are not left open or lying on the floor with the potential for exposure to dust, which may potentially carry micro-organisms;
- appropriate procedures are in place to allow cleaning of linen trolleys.

Soiled Linen Storage

9.77 The following types of linen should be segregated at source before sending to the laundry:

- used linen;
- heat labile linen;

- known or suspected infected linen, which should be placed in a water soluble bag before placing it in the linen bag.

9.78 The layout of laundry areas must be designed to ensure that high standards of cleaning can be maintained. Finishes to walls, floors, work surfaces and equipment must be capable of withstanding regular cleaning and the impact of mechanical cleaning equipment. The area should be large enough to allow access for decontamination trolleys.

Equipment Store

9.79 All healthcare premises require a storage area for large pieces of equipment such as beds, mattresses, hoists, wheelchairs and trolleys, which are currently not in use. Ideally this should be an equipment library with centralised storage, cleaning facilities and trained staff.

9.80 This storage area will not only protect the equipment from contamination and dust which may potentially carry micro-organisms, but also allow free access to floors and shelves for cleaning.

9.81 The layout of these areas must be designed to ensure that equipment is stored safely and securely to comply with manual handling requirements. The area should be fitted with good lighting and finishes to walls, floors, work surfaces and doors to protect against foreseeable mechanical damage; equipment must be capable of withstanding regular cleaning.

Waste Disposal

9.82 There are stringent legislative controls and clear working guidelines for the management of healthcare waste. Guidance on which can be found in SHTN 3: 'Management and disposal of clinical waste'. Good design can minimise problems with segregation, storage and disposal. Identification of categories and the means of segregation of clinical and special waste form the key elements of a waste disposal strategy. In addition, compliance with the National Waste Strategy (SEPA) is essential to reduce the volume of waste going to landfill. Consequently the recycling of Domestic Waste should be an integral part of the Healthcare Facilities Waste Management Strategy.

9.83 Space at ward level is needed for suitable waste containers for all types of waste generated, including recyclates.

9.84 Healthcare waste should be securely stored away from unauthorised personnel. Therefore any new developments, or upgrading, must include a secure disposal store at the entrance of each ward or department, or, alternatively, provide a store to service a floor or area to facilitate safe segregation of all types of waste.

Waste Disposal Room

9.85 The waste disposal room is the temporary storage point for all items of supplies and equipment which have to be removed for cleaning, reprocessing or

disposal, for example linen, central decontamination unit items, all types of waste and sharps.

9.86 The waste disposal room should be of an adequate size for all activities taking place within the area. Other requirements include:

- good ventilation;
- non-slip safety flooring fitted with coving between the floor and the wall to prevent accumulation of dust and dirt in corners and crevices. The floor must be capable of withstanding regular cleaning and the impact of mechanical floor cleaning;
- a large sink;
- a separate hand-wash basin fitted with a mixer tap but with no sink plug and fitted with dispensers for soap, alcohol gel, hand towels and handcream;
- wall protection on all walls and doors;
- wall finishes which should be impermeable and easily decontaminated;
- double door fitted with protective covering to allow easy access for secure and appropriate waste containers and an access control lock.

Cleaning facilities

9.87 Cleaning schedules must be prepared and in place and these schedules should take account of infection risk. Where building works are being carried out, the cleaning schedule may need to be reassessed. The cleaning schedule should be strictly adhered to and a nominated person should sign off satisfactory completion of the cleaning schedule. The cleaning schedule will identify cleaning which should be carried out after use, daily, weekly, etc.

Cleaning equipment

9.88 This will include:

- a range of equipment which must be in good working order and properly maintained including floor scrubbing machines, polishing machines, vacuum cleaning machines, etc;
- sinks for cleaning equipment which should be exclusively for that purpose and should be large enough to adequately clean the pieces of equipment;
- the provision of large sinks in areas where contaminated wastewater or blood or body fluids are disposed of.

Cleaning agents

9.89 The appropriate cleaning agents must be used. When choosing appropriate cleaning agents, various factors should be considered, for example:

- detergents loosen dirt and grease but do not kill bacteria;
- disinfectants kill bacteria;

- hot water and steam kill bacteria.

Laundry facility

9.90 Laundry facilities, whether ward based or centralised should provide;

- suitable space for laundry machinery;
- suitable storage for used linen and for separation of used and laundered linen;
- storage space which is designed to prevent odours from migrating from storage areas to adjacent areas;
- storage space designed to accommodate trolleys etc used in the transportation of linen;
- appropriate facilities to allow the segregation of used linen, heat labile linen and infected linen, in appropriate containers which are clearly identifiable;
- suitable facilities to allow compliance with hand hygiene practices;
- a laundry policy to ensure infection risks are minimised.

Changing facilities

Patient changing facilities

9.91 The increase in day case patients has increased the number of changing facilities required.

9.92 In areas such as out patients, imaging, day surgery, endoscopy and minor injuries units, it will be necessary to provide changing/storage facilities if clothing has to be removed and kept safe.

9.93 Flooring in these areas should be non–slip, easily cleaned and appropriately wear resistant. All surfaces must be able to withstand regular cleaning with both detergent and disinfectant products. All cubicle/screens must be able to withstand washing procedures at disinfectant temperature i.e. 3 minutes at 71°C or 10 minutes at 65°C.

9.94 All soft furnishings must be covered in an easily cleaned impervious material within all clinical and associated areas. Soft furnishings which are damaged should be removed for repair or disposal. The use of tape for repair is inappropriate. The fire resistance of furnishings and all fabrics must comply with SHTM 87: ‘Textiles and Furniture’. Cleaning processes should be developed to ensure that fire resistance is not compromised.

9.95 Hand-wash basins, sanitary facilities and showers should be provided in these areas.

Staff changing facilities

9.96 Changing facilities should be provided for staff to encourage them to change out of their uniform in the workplace. This is particularly important if the staff member is working in a clinical area or CDU. Facilities should be provided which allow staff to store their personal possessions safely. Locker sharing can reduce storage requirements.

9.97 Sanitary facilities and showers should be provided for male and female staff in these areas.

9.98 The distance from the working area may affect how often staff use the facilities. However, in the interest of the personal security and safety of staff, staff changing areas should be sited in the main area of the healthcare facility if not very close to (or within) the ward. Changing areas and showers should also be provided for staff who have become contaminated.

9.99 Staff should change from their outdoor clothing into their uniforms in the changing facilities provided.

9.100 By providing staff changing facilities with adequate areas for storage of clothing e.g. lockers, staff will be able to change from their staff uniforms into their outdoor clothing on site. This practice should encourage staff to travel home in their own clothes, not their uniform.

9.101 Staff must have easy access to a hand-wash basin and showering facilities in the event of a spillage, accident or contamination.

9.102 The Watt Group Report (2002) stated that specific guidelines and facilities (washing, showering and cleaning/changing uniforms) should be available in every hospital for the decontamination of staff who become grossly contaminated by blood or body fluids.

Maintenance Staff

9.103 Separate clothing should be provided for maintenance staff to change into when moving between clinical and non-clinical areas. Consideration should also be given to providing changing facilities for maintenance staff, service engineers etc who may have to change into scrub suits and dedicated footwear for work carried out in clean areas.

Uniform changing

9.104 Best practice suggests an area should be provided in staff changing where staff can order clean uniforms. In this area, staff should also be able to collect their laundered uniforms and dispose of soiled uniforms for onward processing at the laundry.

Bed space area

Patient mobility

9.105 Patient mobility is considered vital for aiding recovery and maintaining physical health and hygiene. It is well understood that this helps reduce length of stay and physical complications in the recovery period.

9.106 The provision of sufficient space is essential for nurses and therapists to work, to accommodate wheelchairs and walking aids, and to assist the mobility of patients. Guidance on which can be found in SHPN 04: 'In-patient Accommodation: Options for choice'.

Clinical treatment

9.107 Many of the activities that previously took place in a treatment room now take place at a patient's bedside and therefore additional space is required for equipment and for clinical procedures to take place. It should be noted that treatment rooms may provide a cleaner environment in which less activity takes place during procedures.

Moving and handling

9.108 Moving and handling of patients is a major cause of back injury and other musculo-skeletal disorders amongst staff. To avoid such injury, patients should be moved using equipment designed specifically for the purpose. Sufficient space is therefore required to manoeuvre this equipment around the bed. Manual handling equipment can contribute to the transmission of micro-organisms if not adequately cleaned and stored.

Family support and visiting

9.109 Visits from family and friends are important for the well-being of patients. There should be sufficient space around the bed to allow for seating without disturbing patients in other bed spaces or the flow of nursing care. Adequate toilet facilities should also be in place to limit the risk of infection from visitors using the patient's en-suite facilities. Insufficient seating round the bed space area can lead to prevention and control of infection issues.

The Chief Medical Officer has introduced five tips for the public visiting patients in hospital to help in reducing cross infection. These are:

- think about keeping patients safe before you visit someone in hospital. If you, or someone you live, with has a cold or diarrhoea, or if you feel unwell, try to stay away until you are better;
- wash and dry your hands before visiting a hospital ward, particulary after going to the toilet. If there is alcohol hand gel provided at the ward door or at the bedside, use it;
- ask ward staff for advice before you bring in food or drink for someone you are visiting in hospital;

- if you visit someone in hospital, don't sit on their bed, and keep the number of visitors to a minimum at any one time. Never touch dressings, drips, or other equipment around the bed;
- if you think NHS premises are not as clean as they should be, let the Sister/Charge Nurse know. If you think a healthcare worker has forgotten to wash their hands, remind them about this.

Accessibility for Staff

9.110 Poor access around the bed is stressful for staff who have to work, often under pressure, within limited space, entailing more potential for accidents, mistakes and delays. Moving and setting up equipment takes valuable time and this is hindered by limited space. Gaining access to bedhead controls and monitoring equipment also requires sufficient space.

9.111 In multi-bed areas there should be sufficient space around each bed for staff to carry out procedures without disturbing patients in adjacent beds and to provide a degree of auditory privacy. There is now a great deal more activity taking place at, or close to, the bedside which falls into three categories:

- clinical treatment and care;
- personal care;
- support duties including cleaning.

Cleaning

9.112 There needs to be space to allow the easy movement of beds and equipment to facilitate cleaning. Access for cleaning must be considered a key design factor for planners and architects designing new buildings or refurbishments.

Storage

9.113 Adequate space to store equipment away from the bed space is necessary, as inappropriately stored equipment can interfere with cleaning and create a reservoir for micro-organisms.

Fixtures and fittings

9.114 Fixtures and fittings should be easy to clean. Their design needs to take account of cleanability e.g. the surface material, access to all surfaces, etc. Complex dismantling to enable cleaning to be achieved is a disincentive to effective cleaning. Involvement of Domestic Managers in selection of fixtures and fittings is advised.

9.115 Fixtures and fittings should be movable as far as possible to ease cleaning.

Walls

9.116 Smooth, hard, impervious surfaces are recommended in clinical areas as they are easier to clean and bacteria cannot readily adhere to them (Bartley, 2000;

Ayliffe et al, 1999). Design should ensure that surfaces are easily accessed, will not be physically affected by detergents and disinfectants and will dry quickly.

Ceilings

9.117 Smooth, hard, impervious surfaces are recommended in theatres and isolation rooms. Caution should be used when considering the use of ceilings to produce visually appealing areas as they can be difficult or time-consuming to access for cleaning, for example hidden lighting or box-work.

9.118 False ceilings may be associated with accumulation of dust or fungi and can harbour pests. It is therefore essential that buildings are checked on completion to ensure that no unwanted materials from the building works remain and that there is no access for pests (Ayliffe et al, 1999). Ceilings with removable tiles or perforated ceilings can allow dust to fall onto the area below during maintenance work. This type of ceiling should therefore be avoided in isolation rooms, operating theatres and treatment rooms (Ayliffe et al, 1999).

9.119 Pipes and cables running through walls above false ceilings should be sealed so far as is practicable.

Doors

9.120 All bays and single rooms used to segregate patients require doors if they are to be used for cohort nursing or isolation nursing. They should have smooth handles which can be easily cleaned, will not be physically affected by detergents and disinfectants and will dry quickly.

Windows

9.121 Windows, although not directly a prevention and control of infection issue, allow patients in isolation/segregation to feel less shut off from the world and have been shown to add to the therapeutic process where there is pleasant view.

9.122 Glass partitions, instead of solid walls, enable patients to see what is happening in the ward but there will also be a need to allow for patient privacy at times. Double-glazed windows with integral blinds are practical and solve a range of cleaning problems.

9.123 Windows in operating theatres, treatment rooms and isolation/segregation rooms should be fixed and sealed.

9.124 Avoid ledges as in cottage-style windows because this will allow for the accumulation of dust; ledges also require a significant cleaning commitment.

Radiators

9.125 Radiators have been implicated in outbreaks of infection with meticillin resistant *staphylococcus aureus* and are often difficult to clean because they are enclosed in bay windows or in protective covers to prevent burns. They should be smooth, accessible and cleanable.

9.126 Pipework should be contained in a smooth surfaced box that is easy to clean; pipework sited along a wall can become a dust trap and can be impossible to clean.

9.127 Pipes and cables running through walls above false ceilings should be sealed as far as is practicable.

9.128 Radiators should be smooth, accessible and easy to clean. Pipework should be boxed or enclosed with surfaces which are easy to clean.

Work surfaces

9.129 Surfaces should be designed for easy cleaning.

9.130 Surfaces near plumbing fixtures should be smooth, non-porous and water-resistant.

9.131 They should be free of fissures, open joints and crevices that will retain or permit the passage of dirt particles.

9.132 All joints must be sealed (Bartley, 2000).

9.133 Horizontal surfaces can become contaminated therefore regular cleaning is required.

9.134 All surfaces must be able to withstand regular cleaning with both detergent and disinfectant products.

9.135 Surfaces should be designed for easy cleaning, free of fissures, open joints and crevices. Surfaces should withstand regular cleaning with detergents and disinfectants. (Further guidance can be found in the NHSScotland National Cleaning Services Specification produced by the HAI Task Force.)

9.136 Internal corners should be coved. Horizontal surfaces not intended for storage e.g. tops of lockers, should be sloped.

Recommendations

9.137

1. The quality of finishes in all areas should be of a high standard. Guidance on the selection of finishes is provided in several SHTMs, SHPNs and SHBNs.
2. Soft furnishings must be covered in an impervious material within all clinical and associated areas.
3. Flooring should be easily cleaned and appropriately wear-resistant.
4. The use of carpets is not advised within any clinical or associated area. Attractive vinyl flooring materials are available which can provide aesthetic appeal.
5. All joints and crevices should be sealed.

6. Curtains must be able to withstand washing processes at disinfection temperatures.
7. Window blinds should be used with caution; the need for regular cleaning in clinical areas must be considered.
8. All surfaces should be designed for easy cleaning.
9. Smooth, hard, impervious surfaces should be used for walls.
10. All surfaces, fittings, fixtures and furnishings should be designed for easy cleaning and durability.

Equipment

9.138 The selection of equipment which can be easily decontaminated both internally and externally is critical. The use of soft 'difficult to decontaminate' fabrics should be avoided where possible. The design of equipment should also be considered, as intricate design details are often difficult to clean properly.

9.139 Equipment that is in direct contact with patients has been implicated in infection outbreaks (Irwin et al, 1980). Equipment that is within the immediate patient environment has been shown to be a potential source of cross-infection. Fixtures and fittings, if difficult to access or clean on a regular basis, fall into this category and must be included as a potential reservoir of infection when risk assessment is undertaken. Design should ensure that surfaces are easily accessed, will not be physically affected by detergents and disinfectants and will dry quickly.

Cleanability

9.140 Decisions about finishes, design, fixtures and fittings at the planning and procurement stages must take account of their cleanability, i.e. recognition of the importance of finishes etc being cleaned and kept clean. Finishes etc, which are difficult to clean are less likely to be properly cleaned and kept clean.

9.141 The quality of finishes etc in all areas should be of a high standard so that there is ease of cleaning and the fabric of the building stays intact and impervious over its life cycle.

9.142 Particular points to consider include the use of:

- hard flooring in clinical areas;
- flooring which can be easily cleaned and is appropriately wear-resistant;
- coving between the floor and the wall to make cleaning easier;
- limited joints which should be welded or sealed;
- floor finishes, such as vinyl, which are impervious and can be easily cleaned;
- flooring which must be securely anchored. Lifting of the floor can create reservoirs of infection;

- surfaces such as wood, tiles and unsealed joints which should be avoided because they are more difficult to clean;
- flooring of a material which is unaffected by detergents and disinfectants;
- flooring in areas subject to traffic which, when wet, should have high slip resistance;
- carpets, these should not be used in clinical areas.

9.143 The use of dividers or screens that can be manoeuvred on wheels can be of benefit in ITU areas. The use of these dividers requires consideration at the planning stages as extra space is required both for their use between beds and for storage. It is also important that they are easily cleanable.

Electrical supply

9.144 Guidance on the supply of electricity can be found in SHTM 2007: 'Electrical services: supply and distribution'. If the ventilation system is used to control airflows to minimise cross infection, this system should be on a dedicated power supply which is clearly marked and designed to avoid accidental isolation. Where practical, power supplies should be classed as essential.

Electrical power services and sockets

9.145 Sufficient 13-amp switched and shuttered socket outlets should be provided in corridors and in individual rooms to enable domestic cleaning appliances with flexible leads (9 metres long) to operate over the whole department.

9.146 Where possible, socket outlets should be flush-mounted or in trunking systems to prevent the build up of dust.

Ventilation

9.147 In specialised applications such as isolation rooms or decontamination facilities, it is important to be able to monitor the effectiveness of the ventilation systems by means of visual indication such as pressure gauges. Where visual indication is provided, it is essential that the procedures for checking and recording the reading, if necessary, are clearly laid down and staff are adequately trained in the operation of the system and action to be taken in the event of system failure.

9.148 Isolation rooms which have a ventilation system capable of providing either positive or negative pressure within the room are not generally recommended. This is because investigations of failures of such systems have identified lack of staff awareness of the purpose and functioning of the system as key factors.

9.149 Guidance on the use of ventilation systems is given in SHTM 2025: 'Ventilation in Healthcare Premises' and SHPN 13: 'Sterile services department'.

9.150 Consideration should be given to room layouts and the relationships between rooms and should be such that they avoid cross infection. Similarly, so as to avoid cross infection, Domestic Services Room (DSR) and service rooms

should be located away from clinical or patient areas and extract outlets should be directed away from air intake vents.

Hot and cold water supplies

9.151 Guidance on hot and cold water supplies can be found in SHTM 2040: 'The control of legionellae in healthcare premises: a code of practice' and SHTM 2027: 'Hot and cold water supplies: storage and mains services'. Guidance on water filtration can be found in SHTN 2: 'Domestic hot and cold water systems for Scottish Healthcare premises'. Safe and effective hot and cold water supplies are paramount in healthcare premises to maintain a safe and comfortable environment for patients and staff, and for treatment at all levels of clinical and surgical care. Water must be supplied at an appropriate temperature and pressure, for example:

- water being supplied to hand-wash basins, baths etc should not cause scalding of the user;
- water being supplied to the DSR and or Pantry should be at a higher temperature however these need to be clearly marked as providing "VERY HOT WATER";
- systems should be designed to ensure continued circulation of water where practical;
- systems should be insulated to avoid heat transfers from hot supplies to cold;
- dead legs in pipework should be avoided;
- consideration should be given to the space and plumbing required for chemical treatment of water systems e.g.
  - compatibility of chlorine dioxide treatment;
  - the necessity for reverse osmosis plant in renal dialysis or sterile supplies units;
- careful consideration should be given to the frequency of use of fixtures especially where infrequent use may result in legionella control problems e.g. showers, sinks, long pipe runs.

9.152 Contamination of the water supply has been recorded as a cause of disease and death in both the public health arena and the hospital setting. It is important, therefore, that drinking water in healthcare settings is safe, readily available to patients and is palatable to encourage drinking. The new EU Drinking Water Directive, which is transposed into UK law by the Water Supply (Water Quality) (Scotland) Regulations 2001, contains new provisions to ensure that the drinking water supply within buildings to which the public has access remains wholesome and is not adversely affected by the domestic plumbing system.

9.153 Access to chilled water, which is plumbed directly off the mains, may be important when patients are feeling unwell, pyrexial or the ambient temperature

is high. Patients who are ill become dehydrated and may need to increase their fluid intake.

9.154 A plentiful supply of water for other uses such as personal hygiene, hand hygiene and cleaning of the environment and equipment is also needed. Storage of this water requires careful consideration and can present problems if not dealt with appropriately.

9.155 Systems employed in the storage and conveyance of water for human consumption, and or use, should be designed and installed in order that the growth of harmful organisms, and hence the risk to people, is minimised.

9.156 Systems must incorporate measuring devices to monitor salient parameters accurately and allow trend logging to demonstrate the efficiency and sufficiency of the control measures employed. The number, type and location of the measuring devices should provide data that is representative of the whole system. Whilst it is desirable to increase the availability and access to drinking water and hand hygiene appliances, the provision of such must not encourage the incidence of water within sections of systems which may have a tendency to stagnate. Low flow and no flow of water within systems particularly where temperature variation may occur as a result, must be minimised as far as reasonably practicable to ensure the conditions that will encourage the growth of harmful organisms are avoided as far as possible.

Storage of water and policies for maintenance

9.157 Many organisms, such as species of nontuberculous *Mycobacteria*, *Pseudomonas* and *Legionella*, have been isolated from hospital water systems. Guidance on the control of *Legionella* in water systems can be found in the Health & Safety Executive's approved Guidance Note L8: 'Legionnaire's disease: the control of *Legionella* bacteria in water systems' and SHTM 2040: 'The control of legionellae in healthcare premises - a code of practice'. Problems associated with *Legionella* have been documented in healthcare premises however these problems have been minimised by:

- cleaning water storage tanks;
- maintaining a consistently high temperature in hot water supplies or introducing a form of online disinfection such as chlorine dioxide or ionisation if lower temperature hot water is used to avoid the need for thermostatic mixing valves (see Health & Safety Executive L8, Scottish Health Guidance Note 'Safer' Hot Water and Surface temperatures and SHTM 2040: 'The control of legionellae in healthcare premises - a code of practice');
- regular maintenance of plant;
- removing plumbing dead-legs;
- keeping cold water systems cold;
- minimising water storage.

9.158 In large hospitals, storage tanks are often necessary to ensure adequate supplies of water. Findings of *Aeromonas hydrophila* in seasonal trends by Picard and Goullet (1987) suggests that monitoring the water supply, especially during the summer months, is valuable. They also discuss the importance of keeping storage tanks clean and designing storage facilities to minimise excessive cold water temperatures, which should then reduce the tendency for multiplication of not only *A. hydrophila* but also *Legionella spp*.

9.159 Good practice requires that hot and cold water pipework are separated (i.e. not in the same ducting) to a sufficient margin to avoid heat transfer to the cold water supply. Hot and cold water pipes should not be installed in the same space e.g. voids or ducts where a sufficient margin of separation cannot be provided between pipes to prevent heat transfer. It has also been suggested that there is a need for testing, following a survey of bacteriological quality of water from hospitals by Hunter and Burge (1988).

9.160 Guidance on hot and cold water systems can be found in SHTM 2027: 'Hot and cold water supply, storage and mains services'.

Provision of single room facilities

9.161 With an increase in the incidence of antibiotic-resistant bacteria and immuno-compromised in-patients, there is an increasing need for en-suite single rooms and negative or positive pressure isolation rooms. Single rooms with en-suite facilities allow for easier management of infection than wards. The current trend is for new facilities to have more single rooms than previously with some parts of the UK planning on a basis of at least 50% single rooms. Provision of isolation/single rooms will help prevent the spread of organisms, especially those transferred by the airborne route or those easily disseminated into the immediate patient environment. En-suite single rooms also provide greater privacy and are preferred by many patients.

9.162 Many patients with an infection require physical isolation. However, often patients cannot be isolated because of a shortage of single rooms and isolation rooms. The key to effective isolation on acute general wards is the provision of single rooms with en-suite sanitary facilities. Single rooms reduce the risk of cross-infection for both non-airborne and airborne diseases and help to lower the incidence of HAI. Most patients on acute general wards can be isolated/segregated in single rooms with en-suite facilities. All single rooms in new-build hospitals should have en-suite facilities so that they can, among other reasons, be used to isolate/segregate patients.

9.163 Historically, isolation/segregation in general wards has been provided in single rooms, sometimes without en-suite facilities. Rooms without en-suite facilities often cannot be used to isolate patients effectively.

9.164 Ventilated isolation suites with en-suite facilities can also be provided. They may have a ventilation system that provides a positive pressure in the room to protect the patient from infection, or a negative pressure to prevent a patient from infecting others, or the ventilation may be switchable from positive to negative. These rooms rely on staff being able to assess the type of ventilation

required when a patient arrives on the ward and, for switchable systems, knowing how and when to select the correct ventilation mode. Patients can be put at risk if the ventilation mode is not set correctly and as such the provision of isolation rooms which are switchable from positive to negative air pressure is no longer recommended because of the risk to people inside and outside the room in the event of the setting being incorrect.

9.165 There are four main reasons for caring for patients in single rooms:

- patient susceptibility to infection from other sources;
- patient presents an infection risk to others;
- non-medical, for example patient preference;
- clinical but not infection-related.

9.166 In terms of infection control, only patients in the first two categories require isolation. Patients in the latter two categories can be cared for in standard single en-suite rooms used to segregate patients. In order to simplify the use of isolation facilities, two room designs for isolating patients in acute general settings are discussed:

- single room with en-suite facilities;
- enhanced single room with en-suite facilities and ventilated anteroom (isolation suite).

Single room with en-suite facilities

9.167 A single room with en-suite sanitary facilities having extract ventilation is a simple, cost-effective way to provide isolation/segregation and will meet the needs of most patients on general wards. The room does not require any specialist knowledge or action by the nursing staff to operate it. When not being used for isolation the room can be used for general nursing.

Enhanced single room with en-suite facilities and ventilated lobby (isolation suite)

9.168 An enhanced single room with a positive pressure ventilated entry lobby and en-suite facilities with extract ventilation provides both source and protective isolation. The positive pressure lobby ensures that air from the corridor does not enter the isolation room, and that air from the room does not escape into the corridor. This simple design enables the suite to be used for either source or protective isolation without the need for switchable ventilation or special training for staff. It also provides safe isolation/segregation for patients whose condition is unknown.

Advantages

9.169 Both rooms are suitable for caring for patients not in isolation but who require a single room for other reasons. In addition, both room designs are simple in

concept, safe in operation, and do not require the nursing staff to have any specialist ventilation knowledge.

9.170 On occasions, it may be necessary to prioritise the use of the available isolation and single rooms used to segregate patients. In such situations, consideration must be given to cohort nursing of patients within small 2/4 bed bays.

9.171 The focus of single/isolation rooms discussed in this part of the document include:

- the role of isolation/single rooms in preventing cross-infection;
- cohort nursing;
- quantity and design;
- negative/positive isolation rooms;
- hand-hygiene facilities;
- sanitary facilities;
- storage of personal protective equipment;
- size and layout;
- visibility/location;
- furnishings and fixtures;
- finishes;
- floors;
- walls;
- ceilings;
- doors;
- windows;
- engineering requirements.

The role of isolation in preventing cross-infection

9.172 The primary aim of prevention and control of infection is to prevent the spread of infection between patients, visitors and staff by the control or containment of potentially pathogenic organisms. Many of these organisms can be controlled by basic prevention and control of infection practices such as hand-hygiene and environmental hygiene, but isolating/segregating the source patient can only effectively contain certain organisms.

9.173 'Negative pressure' isolation rooms are essential for infections transmitted by the airborne route: it has been reported that isolation of infected patients prevents cross-infection in outbreaks of tuberculosis (Louther et al, 1997). For other infections, a patient can be accommodated in a single room which can segregate the patient.

Cohort nursing

9.174 When an index case of infection is followed by several secondary cases, it may be necessary to cohort nurse a group of patients in a bay if insufficient single rooms are available. This can be more easily achieved where wards are divided into small bays (two or four beds per bay) which can be isolated/segregated further by closure of doors at the entrance/exit and which also have en-suite facilities. When prevention and control of infection guidelines are adhered to, research has demonstrated that cohort nursing can successfully control and contain infection in hospital (Cartmill et al, 1994; Zafar et al, 1998; Green et al, 1998; Karanfil et al, 1992; CDC, 1995, 1997).

9.175 There is currently no definitive guidance on size, ventilation or the equipping of isolation rooms. NHSScotland SHPNs for relevant departments such as wards, theatres and other specialised areas and SHTM 2025: 'Ventilation in healthcare premises', give advice on natural ventilation, general extract ventilation and ventilation for specialised areas.

9.176 Experience has shown that many hospitals find the present allocation of isolation/single rooms inadequate to deal with the increasing numbers of infected and immuno-compromised patients (Langley et al, 1994; Wiggam and Hayward, 2000). Hospitals with 10% of their bed contingent as single rooms often find that this number is inadequate to cope with every infectious patient. Where this is the case, risk assessment needs to be used to inform decisions regarding which patients to nurse in single rooms.

Hand-hygiene facilities

9.177 Hand-hygiene and the use of Personal Protective Equipment (PPE) are key to preventing the spread of infection. Sufficient hand-wash basins must be supplied in a room used to isolate patients (and attached ante-room) and single room. This is in addition to the basin provided for patient wash facilities. Elbow taps for clinical hand-wash basins are preferred and the touch-free control of water flow will further aid the control of infection, although maintenance implications need to be considered.

Sanitary facilities

9.178 Personal hygiene contributes to the prevention of cross-infection and is improved if patients have their own bath or shower, WC and hand-wash basin. Single rooms should therefore be provided with en-suite sanitary facilities. An en-suite single room should also be able to accommodate a hoist for lifting patients.

Size and layout

9.179 Additional facilities may be required for the care and treatment of patients in isolation rooms/single rooms, especially if the isolation is likely to last for some time. The facilities required may include the storage of:

- supplies retained in the room;

- personal clothing and possessions;
- essential domestic cleaning equipment held in en-suite sanitary facilities.

9.180 Where possible, the opportunity should be taken to size the room so that the bed can be placed parallel to the external wall, thereby allowing the patient to enjoy a view of the outside. An intercommunication system, while not essential, is desirable as this allows the patient verbal contact without compromising their isolation.

Visibility/location

9.181 If patients are to stay in an isolation/single room or bay, it is important that they are able to see staff from their beds. Staff should also be able to see the patient in case of an emergency. This reduces the psychological problems of isolation/segregation. Providing outside views using windows with low sills can also reduce the sense of containment.

Furnishing and fixtures

9.182 In isolation/single rooms/small bays where infectious patients are nursed, it is important that there is enough space to easily clean furnishings and fixtures.

Finishes

9.183 Ledges, recesses and tight angles where dust particles can be trapped should be avoided to allow ease of cleaning. It should be ensured that detergents and disinfectants will not physically affect surfaces and that they will dry quickly.

Floors

9.184 Carpets are not advisable in isolation/single rooms as carpets may prolong the survival of certain micro-organisms.

Walls

9.185 Wall finishes should be impermeable and easily wiped over if necessary.

Ceilings

9.186 These should have homogeneous plastered surface with flush-mounted recessed lights, ventilation grilles and other ceiling fixtures, where possible. Removable ceiling tiles in a grid layout are not advised for isolation rooms.

Doors

9.187 The corridor door to the room should be one and a half leaf and contain a large vision panel. A means of obscuring the vision panel should be included within the door.

9.188 Doors should have smooth handles which can be easily cleaned, will not be physically affected by detergents and disinfectants, and will dry quickly.

Windows

9.189 These will need to be lockable when the specialised ventilation is turned on. Curtains to provide privacy should be controlled within the room.

Engineering requirements for isolation rooms

9.190 Provision of mechanical ventilation systems is important in controlling the required direction of air movement between isolation rooms and the adjacent corridor.

9.191 For negative pressure isolation rooms, there should be a readily visible monitor independent of the air supply/extract system. This is best achieved by monitoring the pressure differential between the patient room and corridor or lobby. This differential should preferably be monitored continuously, i.e. a pressure sensor linked to an alarm at the nurses' station should the pressure drop below a pre-set limit. The alarm should have a built-in delay of a few seconds so that it does not activate every time the door is opened. For negative pressure isolation rooms, there should be an interlock system such that supply ventilation is cut off if the extract ventilation fails. There should be a clear indication to users that the ventilation has failed.

9.192 For isolation rooms with both negative and positive pressure ventilation, the mechanism for switching from one to the other should be lockable. As mentioned previously, it should be noted that this option of having isolation rooms with switchable ventilation is not generally recommended as infections have been transmitted through patients being cared for in a positive pressure room when they should have been in a negative pressure room. Staff should be properly trained on how to use the mechanism. With regard to the en-suite sanitary facility, the extract ventilation should be designed to work in conjunction with the main ventilation system.

9.193 General space/heating requirements can be met by the same method as for 'standard' single rooms. Care should be taken in selection of the heat emitter, as it needs to be easily cleaned and should not have inaccessible corners.

9.194 To reduce dust contamination and ease cleaning, luminaires should be recessed, dust-excluding and fully accessible from below.

9.195 Planned maintenance and monitoring programmes must be established for ventilated rooms to ensure the design criteria is maintained and met at all times. Although it is impossible to give specific maintenance frequencies, each unit must be included in a planned preventative maintenance schedule that includes pressure/air flow monitoring equipment.

Hand-hygiene facilities

Clinical Sinks

9.196 Hand-hygiene is the single most important factor in the prevention of healthcare associated infection (Ayliffe et al, 2000).

9.197 It is known that compliance with hand-hygiene guidelines have led to a significant reduction in the carriage of potential pathogens on the hands and can result in reduction of patient morbidity and mortality from hospital acquired infection (Pittet et al, 2000).

9.198 The absence of conveniently placed sinks often leads to non-compliance with hand hygiene guidelines. Good departmental design, with sufficient, appropriately placed hand-wash basins can increase compliance.

9.199 Thus, the importance of facilities to encourage hand hygiene should be high on the list of priorities when designing and planning new healthcare premises or refurbishment of existing premises is being undertaken.

9.200 This part of the document discusses:

- design;
- sink provision;
- water/taps;
- hand-hygiene dispensers;
- hand drying.

Design

9.201 Sinks in clinical areas must be suitable for that purpose (not of a domestic design). Hotel-style sinks are not appropriate.

9.202 The dimensions of a clinical sink must be large enough to contain splashes and therefore enable the correct hand-hygiene technique to be performed (Bartley, 2000).

9.203 The sides of the sink should be curved to prevent splashing.

9.204 Hand-wash sinks should be sealed to the wall or placed sufficiently far from the wall to allow effective cleaning of all surfaces.

9.205 Waterproofed sink splash-backs should be included to prevent wall damage and allow ease of cleaning (Ayliffe et al, 1999).

9.206 Clinical sinks should not have a plug or a recess capable of taking a plug. A plug is an unnecessary source of infection (especially *Pseudomonas* spp.) and can discourage staff from washing their hands under running water, particularly if mixer taps are not available.

9.207 Overflows are difficult to clean and become contaminated very quickly, serving as reservoirs of bacteria. They should therefore be avoided (SHPN 04: 'In-patient accommodation – options for choice').

Sink provision

9.208 Hand hygiene facilities must be readily available in all clinical areas. There must be sufficient sinks to encourage and assist staff to readily conform to hand hygiene protocols (Boyce et al, 2000; Feather et al, 2000; Carter and Barr, 1997; Dancer, 1999; Department of Health, 2000; Harris et al, 2000; Larson and Killien, 1982; Pittet, 2000). Inconveniently located hand hygiene facilities are one of the main reasons that healthcare staff do not comply with hand hygiene protocols (Larson and Killien, 1982; Pittet, 2000).

9.209 There is a need to review the numbers and placement of sinks, as well as their dimensions (Kesavan et al, 1998; Bartley, 2000). Guidelines for the appropriate numbers of sinks in clinical areas have been identified (SHPN 04: 'In-patient accommodation - options for choice'). This guidance suggests a minimum of one sink per single room or small ward area and one sink per six beds in a large multi-occupied room. However, to encourage good practice and give reasonable access, it is recommended that there should be:

- ideally, in **intensive care and high dependency units (critical care areas)**, one hand-wash basin at the front of each bed space;
- one sink between four patients in **acute, elderly and long-term care** settings; and
- one sink between six patients in **low-dependency** settings, for example mental health units and learning disability units.

9.210 In **primary care** and **out-patient** settings where clinical procedures or examination of patients/clients is undertaken, then a sink must be close to the procedure, ideally in the same room or in a cubicle section of the room.

Water/taps

9.211 Health and safety regulations (The Workplace [Health, Safety and Welfare] Regulations, 1992) require that both hot and cold running water should be available in areas where employees are expected to wash their hands.

9.212 Hands should always be washed under running water; mixer taps allow this to be practised in safety in healthcare settings where water temperatures are high to combat *Legionella* spp.

9.213 Taps should be elbow, knee or sensor-operated (SHPN 04: 'In-patient accommodation - options for choice') for hand hygiene.

9.214 Taps should be easy to turn on and off without contaminating the hands. Infrared taps are an alternative but these are expensive and can pose problems with cleaning and flushing (Bushell, 2000).

9.215 Taps discharging into a shallow sink or directly into a drain hole can cause splashing which disperses contaminated aerosols. Thus, the tap outlet flow should not point directly into the sink outlet (Ayliffe et al, 2000).

9.216 Avoid swan-neck tap outlets, as they do not empty after use. Strainers and anti-splash fittings at outlets should not be used as they easily become contaminated with bacteria.

Hand hygiene dispensers

9.217 Skin disinfectants and soaps must be wall-mounted near the sink so that the user can operate the dispenser properly without risking contamination. Soap dispensers should not be refillable but be of a disposable, single cartridge design.

Alcohol based hand rubs

9.218 Alcohol-based handrubs have an important role, especially when access to hand-wash basins is difficult (Pittet, 2000). Unlike soap dispensers, these do not necessarily have to be placed by sinks. Alcohol based handrubs are a key aid in the prevention and control of infection. It is recognised that these materials are highly flammable and an appropriate fire risk assessment should be carried out with consideration given to the storage of these products. Ingestion of the product by certain patient groups has also been reported. The National Patient Safety Agency in England (2004) has stated that personal dispensers should be used where there is an increased likelihood of patient ingestion. Risk assessment should be carried out on the use of alcohol based handrubs, the location and size of dispensers and the storage and disposal of new stock, giving consideration to the likelihood of ingestion especially in high risk ward areas and clinical units.

Hand drying

9.219 Hand drying is of equal importance in maintaining hand hygiene as wet surfaces can transfer micro-organisms more effectively.

9.220 Paper hand-towels dry hands rapidly and dispensers can be used by several people at once. They are considered to be the lowest risk of cross-infection and are the preferred option in clinical practice areas (Bushell, 2000). The dispensers should be conveniently placed by hand-wash sinks.

9.221 The use of paper towels in rolls should be discouraged. They are difficult to tear off without contaminating the remaining roll (Gould, 1994; Hoffman and Wilson, 1994).

9.222 To discourage the use of reusable towels, towel rails should not be installed next to clinical hand-wash basins. Fabric towels are recognised as a source of cross contamination and are not recommended in clinical practice (Blackmore, 1987).

9.223 Hot-air dryers should not be used in clinical areas as warm air currents dry hands slowly and can be used by only one individual at a time. This results in queues and the temptation to dry hands on clothing (Bushell, 2000).

9.224 Foot-pedal-operated bins with a waste bag should be provided by each clinical hand-wash basin (Gould, 1997).

9.225 A minimum of one hand-wash sink in each single room is required. En-suite single rooms should have a hand-wash basin in the en-suite facility in addition to a clinical hand-wash basin in the patient's room.

9.226 Isolation rooms/single rooms used to segregate patients should have a hand-wash sink in the ante-room, isolation room and en-suite facilities.

9.227 Ideally, in intensive care and high dependency units (critical care areas), consideration should be given to providing one hand-wash basin for each bed space.

Catering/food hygiene

9.228 There are many important requirements to be considered when planning a new catering facility, whether this is a new build or an upgrade of an existing building. In the planning and design of such a facility it is essential that professional input is obtained from a number of sources, particularly the Local Environmental Health Office, NHS Infection Control, Health & Safety.

9.229 It is important that the following areas are considered:

- the size of the facility must first of all be established and this is generally based on the estimated daily production requirements (size should be 'fit for purpose' and not restricted by the space available);
- style of food production and service to be used e.g. cook/serve, cook/chill, bulk or plated service. The patient type and layout of the hospital site can heavily influence this decision and will assist in the choice of equipment.

9.230 To enable ease of maintenance, the general fabric of the internal building should be given careful consideration with suitably finished surfaces for floors and walls. Consideration should be given to the following:

- general ventilation is a key factor to be considered including environmental temperatures of workspace;
- the design should be based on a logical flow pattern for production and service e.g. goods inward > checking and storage > preparation > production > service/distribution > returns > etc;
- safe holding and handling of food requires careful consideration when designing refrigeration/chilling/freezing requirements;
- satisfactory facilities must be made available for catering staff changing in accordance with guidance (e.g. HBN 10: 'Catering department'. Comments on use in Scotland can be found in SHHD/DGM 86/43), with specific planned arrangements for hand hygiene both prior to entering and whilst in the catering/food handling area;
- to aid compliance with the relevant Food Safety Legislation, a competent Hazard Analysis and Critical Control Point (HACCP) system must be

developed. This should be developed in conjunction with the Local Environmental Health Department;

- attention should be given to planning for adequate segregated storage capacity e.g. chilled foods, raw, cooked, dry goods, dairy foods, disposable goods, cleaning materials, waste material awaiting uplift, etc;
- in the area of preparation facilities, attention must also be given to segregated temperature controlled areas particularly for chilled food handling.

9.231 Patients can be particularly vulnerable to the effects of food-borne infection. This is usually traced to a bacterial source and problems can arise from contamination from food handlers, utensils and work surfaces as well as incorrect or inadequate food hygiene precautions. It is important that management control systems, for example HACCP (Hazard Analysis and Critical Control Point): see the Department of Health's (1993) 'Assured safe catering – a management system for hazard analysis', good practices and the conditions in which the food is stored, prepared, processed, distributed and served all enable high standards of hygiene to be achieved and readily maintained.

9.232 To facilitate appropriate standards of personal hygiene for staff, there should be hand-wash basins in each preparation area and in the cooking and serving areas. Non-touch taps should be specified, and liquid soap and paper towels should be provided. Basins should be sited where they cannot splash onto food preparation equipment.

9.233 Once a decision has been taken on the style of cooking and service to be adopted, consideration should then be given to equipment choice. It is essential that equipment is chosen which will facilitate ease of cleaning, with mobility being a feature wherever possible.

9.234 Equipment selection should be carried out with as much research as possible into the technology available. Key features to take account of when planning equipment selection include:

- carefully specify requirements;
- use National Contracts available;
- carry out detailed tendering process with realistic time-scales;
- budget for preventative maintenance contracts for all production and service equipment, with particular emphasis on the ability of the equipment to maintain acceptable food temperatures during transit. Plan to include spare capacity in the stock of trolleys in order to allow for breakdown and removal from service for maintenance and cleaning.

Ward kitchens, pantries and therapeutic kitchens

9.235 Equipment purchased must conform to the standards in the Food Safety Act 1990 (Scotland). This includes the need for a separate hand-wash basin and

finishes used for the floors, walls, etc. The size and design will vary according to the overall decision for food preparation in the premises. If a cook-chill system or regeneration of frozen food is to take place, the kitchen will need to be larger to house the regeneration oven and will need additional ventilation.

9.236 Catering facilities at ward level require careful consideration. During the course of the day, a wide range of catering procedures will take place in the ward kitchen/pantry areas. These procedures are normally carried out by either nursing or domestic services staff with the majority of the tasks carried out relating to the preparation of 'between meal' snacks and beverages and the washing up of crockery, cutlery and glassware. The ability to be able to maintain a clean environment is of paramount importance and the ward kitchen should be designed to facilitate this.

9.237 Space required will vary according to the number of beds which the facility will serve and the style of food service will also dictate the space required. e.g. bulk food service or plated meals. A bulk food service may require crockery from all meals to be washed at ward level whilst the plated service will normally see crockery from the three main meals returned to the main hospital kitchen for wash-up, with only between meal snacks and beverage crockery washed at ward level. The ward kitchen should be designed to allow sufficient space to allow a number of staff to work in the area at the same time and to accommodate the required level of storage and equipment.

9.238 The ward equipment to be selected should be of industrial standard to ensure that it is capable of dealing with the heavy demands made on it. Domestic type appliances should be avoided, particularly refrigerators, ice-making machines, dish-wash machines and hot water boilers. Advice from the Infection Control Team should be sought prior to the purchase of equipment.

The following points should be complied with:

Refrigerators: The size of the unit selected should be capable of holding the routine daily supplies. This will be influenced by whether or not a 'pergal' milk dispenser is used in the kitchen or if the refrigerator is required to hold quantities of carton milk. An industrial unit will be more capable of handling the larger quantities of chilled food with a more effective recovery time for chilling of the unit given the frequent opening of the door and loss of temperature. The unit selected should be capable of maintaining a chill temperature of below 4 degrees centigrade.

Dish-wash machine: As with the refrigerator, this should be of industrial standard with the ability to achieve a rinse temperature of 82^0C. The machine should also be capable of operating with an automatic dosing system of wash and rinse products. Storage facilities should also be provided for safe keeping of the wash and rinse products.

Ice-making machine: The type selected should be capable of automatic dispensing of ice and without a storage reservoir, which requires the users to scoop ice from a stock which may have been made too far in advance. Ideally

they should be plumbed from the mains water supply to ensure biofilms are minimised.

Hot water boilers: A thermostatically controlled water boiler should be provided for the preparation of beverages in preference to the use of kettles, particularly in kitchens that supply a service to a ward area.

Microwave: If sited in the ward area, should not be used to cook or reheat food intended for consumption by patients.

9.239 Sufficient storage facilities should be provided to accommodate the range of food and non-food supplies held at ward kitchen level. This is normally held in base storage units and wall mounted cupboards with adequate provision of standard height work-surfaces. Attention must be given to establishing sufficient numbers of electrical sockets to accommodate electrical equipment.

9.240 The general environment should contain adequate levels of ventilation to handle the heat and steam generated by the main kitchen equipment. The floor surface should be easy to clean and preferably of a high slip-resistance. Walls and other surface should be impervious for ease of cleaning.

Occupational Therapy kitchens

9.241 In some hospitals, dedicated kitchen areas are required for use by Occupational Therapy staff for the rehabilitation of patients. The most important factor to consider for these areas is that they should simulate as closely as possible the kitchen conditions found in a standard household environment. However, the need for ease of cleaning, repair and maintenance is a priority.

9.242 The space required will vary from single to multi-use and this requires to be established by consultation with Occupational Therapy staff. Adequate provision should be made for ease of access, taking into account space for patients in wheelchairs and with walking aids. The layout of work-surfaces etc should be decided in consultation with the Occupational Therapist.

9.243 In terms of equipment, the kitchen should be fitted with the normal range of kitchen appliances and these should be of normal domestic size and not industrial specification. These include both electric and gas cookers with oven, microwave oven and fridge. Occupational Therapy staff should be consulted to determine the need for any other items of fixed equipment. Provision should also be made for sufficient numbers of electrical sockets (at worktop level) to accommodate the use of additional kitchen appliances such as toasters, mixers/blenders, kettles, etc.

9.244 The general environment should be to a standard that will facilitate ease of cleaning with no provision for curtains or carpets. The floor surface should be of vinyl with an impervious wall finish and appropriate ventilation in the cooking area. The facility should also be well fitted with a range of domestic type kitchen cupboards, worktops and wall mounted storage units. The level required should be determined by consultation with Occupational Therapy staff.

10. Construction/Refurbishment Stage

Introduction

10.1 During the construction or refurbishment of facilities, a range of circumstances prevail which present significant problems and opportunities in terms of prevention and control of infection. It is also at this stage where lifetime prevention and control of infection problems can either be built in or out depending on the profile and resources given to prevention and control of infection issues. This Section considers the main issues and highlights actions to minimise infection risks during and after the construction phase.

Construction and waste

10.2 Each year in Scotland approximately 6.28 million tonnes of waste are produced by the construction industry (SEPA 2000) and for projects attached to existing healthcare facilities this can cause considerable risk to susceptible patients due to increased risk of fungal spores being released into the air. It is important that this dust and debris is controlled and disposed of safely. Major earthworks are also a recognised factor in legionella infections.

10.3 Barrier systems should be erected and fit-for-purpose closed waste containers supplied.

10.4 Waste produced by the construction industry relating to projects at healthcare facilities, can give rise to infection problems, especially for susceptible patients, and careful planning is required if the potential for infection risk is to be designed out.

10.5 The clinical implications which arise when the system for managing construction waste goes wrong, or is simply not in place, include increased risks to immuno-compromised patients from incorrect transporting and disposal of the waste.

Methods of control

10.6 Construction work in a healthcare facility inevitably generates dirt and dust and with it certain micro-organisms which have the potential to harm immuno-compromised patients. This is especially true of *Aspergillus fumigatus*, a ubiquitous fungus which is spore producing and which is transmitted by inhalation or contact. Dust and debris control is essential along with the need for increased and regular cleaning during and after completion of the building project.

10.7 Designated entry and exit areas should be identified for use and, where appropriate, dedicated lifts should also be identified for use.

10.8 Input from Infection Control Specialists is essential in the planning of the building project as well as during, and on completion of, the construction work. HAI-SCRIBE should be applied as appropriate.

Issues to be considered include:

- refurbishment/new build project;
- workflow;
- infection risk/patient movement;
- specialised areas like theatres, critical care, laundry, treatment areas.

10.9 The prevention and control of infection measures to be considered will apply equally to new build and refurbishment projects.

10.10 Correct workflow systems must be maintained throughout the building project. Input from Infection Control Specialists is essential at each stage of the project, requiring close collaboration between Infection Control Specialists and the Design Team. This is especially important in the planning of specialised units like theatres and critical care facilities.

10.11 Most healthcare departments have clean-to-dirty workflow systems. Workflow is a fundamental of good prevention and control of infection practice and this needs to be reflected when the built environment is being considered. There is often an issue of space being at a premium and there is therefore the temptation to try to fit everything in. It is important to resist this temptation as problems caused by this may last the lifetime of the facility. The healthcare facility should be large enough to adequately accommodate activities taking place within it.

10.12 HAI-SCRIBE highlights the range of construction activities commonly undertaken in healthcare facilities and assesses the degree of risk in relation to population groups.

10.13 In order to ensure the risk of infection is minimised during construction works, consideration must be given to:

- the patient population group being treated;
- the type of construction work being carried out;
- the risk associated with these two factors.

Risk Management methodology

10.14 Kennedy (1996) developed a methodology which assesses the risk of infection from construction works and has highlighted the range of precautions needed to eliminate or manage this risk. Although this system was developed for use in the United States it can be applied to the redevelopment and refurbishment of healthcare facilities within NHSScotland.

Risk to patients of infection from construction work in healthcare premises by clinical areas		
Group 1	**Lowest risk**	1. Office areas. 2. Unoccupied wards. 3. Public areas.
Group 2	**Medium risk**	1. All other patient care areas (unless included in Group 3 or Group 4). 2. Outpatient clinics (unless included in Group 3 or Group 4). 3. Admission or discharge units.
Group 3	**High risk**	1. A & E (Accident and Emergency). 2. Medical wards. 3. Surgical wards (including Day Surgery) and Surgical outpatients. 4. Obstetric wards and neonatal nurseries. 5. Paediatrics. 6. Acute and long stay care of the elderly. 7. Patient investigation areas, including: • Cardiac catheterisation; • Invasive radiology; • Nuclear medicine; • Endoscopy. Also (indirect risk) 8. Pharmacy preparation areas. 9. Microbiology laboratories (risk of pseudo-outbreaks and unnecessary treatment).
Group 4	**Highest Risk**	1. Any area caring for immunocompromised patients*, including: • transplant units and outpatient clinics for patients who have received bone marrow or solid organ transplants; • oncology units and outpatient clinics for patients with cancer; • burns units. 2. All Intensive Care Units. 3. All operating theatres. Also (indirect risk) 4. CDUs (Central Decontamination Units).

***Immunocompromised patients** are those patients whose immune mechanisms are deficient because of immunologic disorders (e.g. human immunodeficiency virus [HIV] infection or congenital immune deficiency syndrome), chronic diseases (e.g. diabetes, cancer, emphysema, or cardiac failure), or immunosuppressive therapy (e.g. radiation, cytoxic chemotherapy, anti-rejection medication, or steroids). Immunocompromised patients who are identified as high-risk patients have the greatest risk of infection caused by airborne or waterborne micro-organisms. Patients in this subset include persons who are severely neutropenic for prolonged periods of time (i.e. an absolute neutrophil count [ANC] of ≤ 500 cells/mL), allogeneic HSCT patients, and those who have received the most intensive chemotherapy (e.g. childhood acute myelogneous leukaemia patients). (CCDR 2001.)

Immunosuppresive conditions identified as risk factors for construction-related nosocomial fungal infections include graft-versus-host disease requiring treatment; prolonged neutropenia or granulocytopenia because of cytoxic chemotherapy; prolonged use of antibiotics; and steroid therapy. Other risk factors for the development of aspergillosis include dialysis and mechanical ventilation, smoking and patient age, the very young and very old being at greater risk Grauhan and colleagues reported that the risk of a fungal infection increases in patients who exhibit three or more risk factors ($p<0.001$). (CCDR 2001.)

Table 7: Highlights the different population groups being treated in the healthcare facility and the degree of risk associated with them.

Type 1	**Inspection and non-invasive activities.** Includes, but is not limited to, removal of ceiling tiles for visual inspection, painting which does not include sanding, wall covering, electrical trim work, minor plumbing and activities which do not generate dust or require cutting of walls or access to ceilings other than for visual inspection.
Type 2	**Small scale, short duration activities which create minimal dust.** Includes, but is not limited to, installation of telephone and computer cabling, access to chase spaces, cutting of walls or ceiling where dust migration can be controlled.
Type 3	**Any work which generates a moderate to high level of dust or requires demolition or removal of any fixed building components or assemblies.** Includes but is not limited to, sanding of walls for painting or wall covering, removal of floor coverings, ceiling tiles and casework, new wall construction, minor duct work or electrical work above ceilings, major cabling activities, and any activity which cannot be completed within a single work shift.
Type 4	**Major demolition and construction projects** Includes, but is not limited to, activities which require consecutive work shifts, requires heavy demolition or removal of a complete cabling system, and new construction.

Table 8: Indicates the types of construction work being carried out within the healthcare facility

	Construction Project Type			
Patient Risk Group	***TYPE 1***	***TYPE 2***	***TYPE 3***	***TYPE 4***
Low Risk	**Class I**	**Class II**	**Class II**	**Class III/IV**
Medium Risk	**Class I**	**Class II**	**Class III**	**Class IV**
High Risk	**Class I**	**Class II**	**Class III/IV**	**Class IV**
Highest Risk	**Class II**	**Class III/IV**	**Class III/IV**	**Class IV**

Table 9: Estimates the overall risk of infection arising and will indicate the class of precaution that should be implemented.

Protection of sensitive areas

10.15 Having highlighted the overall degree of infection risk, appropriate control measures can be implemented to manage or eliminate the risk of transmission. Table 10 highlights the appropriate prevention and control of infection precautions.

	During construction of a project	*Upon completion of a Project*
Class I	1. Execute work by methods to minimise raising dust from construction operations. 2. Immediately replace a ceiling tile displaced for visual inspection.	Clean areas.
Class II	1. Provide active means to prevent airborne dust from dispersing into atmosphere. 2. Water mist work surfaces to control dust while cutting. 3. Seal unused doors with duct tape. 4. Block off and seal air vents. 5. Place dust mat at entrance and exit of work area. 6. Remove or isolate HVAC system in areas where work is being performed.	1. Wipe work surfaces with disinfectant. 2. Contain construction waste before transport in tightly covered containers. 3. Wet mop and/or vacuum with HEPA filtered vacuum before leaving work area. 4. Remove isolation of HVAC system in areas where work is being performed.
Class III	1. Remove or Isolate HVAC system in area where work is being done to prevent contamination of duct system. 2. Complete all critical barriers ie plasterboard, plywood, plastic, to seal area from non work area or implement control cube method (cart with plastic covering and sealed connection to work site with HEPA vacuum for vacuuming prior to exit) before construction begins. 3. Maintain negative air pressure within work site utilizing HEPA equipped air filtration units. 4. Contain construction waste before transport in tightly covered containers. 5. Cover transport receptacles or carts. Tape covering unless solid lid.	1. Do not remove barriers from work area until completed project is inspected by the Board's Safety Department and Infection Control Department and thoroughly cleaned by the Board's Environmental Services Department. 2. Remove barrier materials carefully to minimise spreading of dirt and debris associated with construction. 3. Vacuum work area with HEPA filtered vacuums. 4. Wet mop area with disinfectant. 5. Remove isolation of HVAC system in areas where work is being performed.
Class IV	1. Isolate HVAC system in area where work is being done to prevent contamination of duct system. 2. Complete all critical barriers ie plasterboard, plywood, plastic to seal area from non work area or implement control cube method (cart with plastic covering and sealed connection to work site with HEPA vacuum for vacuuming prior to exit) before construction begins. 3. Maintain negative air pressure within work site utilizing HEPA equipped air filtration units. 4. Seal holes, pipes, conduits, and punctures appropriately. 5. Construct anteroom and require all personnel to pass through this room so they can be vacuumed using a HEPA vacuum cleaner before leaving work site or they can wear cloth or paper coveralls that are removed each time they leave the work site. 6. All personnel entering work site are required to wear shoe covers. Shoe covers must be changed each time the worker exits the work area. 7. Do not remove barriers from work area until completed project is inspected.	1. Remove barrier material carefully to minimise spreading of dirt and debris associated with construction. 2. Contain construction waste before transport in tightly covered containers. 3. Cover transport receptacles or carts. Tape covering unless solid lid. 4. Vacuum work area with HEPA filtered vacuums. 5. Wet mop area with detergent to remove physical soiling before disinfecting area. 6. Remove isolation of HVAC system in areas where work is being performed.

Table 10: Describes the required Infection Control Precautions depending on class of risk (Adapted from Kennedy, 1997)

Ventilation of work site/pressurisation

10.16 Physical barriers erected to allow work activity should be robust and take account of the work activities and potential for damage that can breach this barrier. The work area, where practical, should be at a negative pressure with respect to the clean working areas. Avoid extract outlets discharging into the same areas as clean air intakes. Regular planned inspection of the site, visual airflow or pressure indicators and alarms should be considered.

Procurement

10.17 Infection Control Specialist input is essential at the procurement stage of any construction/refurbishment project. This input is initially required when consideration is being given to the selection of Architects and Designers. There is a case for stipulating that Architects and Designers for healthcare projects are suitably qualified in terms of their knowledge and understanding of prevention and control of infection.

10.18 The specification of building materials, especially surface finishes, healthcare facility equipment, etc should take account of input from the Infection Control Specialist.

Commissioning of systems and equipment

10.19 The work plan should allow for a phased approach to commissioning of systems. Once an area has been commissioned, it needs to be cleaned and sealed off. Equipment can then be cleaned and laid out providing access is strictly controlled prior to final handover.

Validation and verification of equipment

10.20 The Health and Safety files need to be complete and hold all necessary manuals and commissioning certificates. Any reusable medical device requires decontamination information and all necessary instructions. These should be obtained prior to purchase to ensure that the available decontamination facilities are able to deal with the device.

Planning for expansion

10.21 At the planning stage, the Planning and Design Team must ensure input from the Infection Control Specialist. This input would cover the proposed facility expansion and the measures to be put in place during the course of the construction project.

10.22 The prevention and control of infection input at the planning and design stage will mirror that for new build situations and reference should be made to Sections 8 and 9.

10.24 Reference should also be made to the appropriate question sets of HAI-SCRIBE.

Decant facilities

10.25 Major refurbishment or expansion projects would ideally benefit from the availability of a decant facility where patients could be transferred during the course of the construction work. Such a decant facility would also be very useful during the course of an infection outbreak to allow additional isolation/segregation capacity or in the case of an infection outbreak in the community additional patient capacity.

10.26 Given scarce resources and the need to apply health economics, the provision of decant facilities may be regarded as a desirable luxury. However, when consideration is given to the situations in healthcare facilities where a decant facility would be of real value in minimising the risk of infection spread, it may be appropriate to make some decant capacity available.

Environmental sampling/inspection

Physical monitoring

10.27 Physical monitoring of the healthcare environment including temperature, humidity, air change rates, leak rates, direction of air and water flow, particle counts and filter efficiency testing methods can help ensure that environmental conditions in the healthcare facility are such that they do not contribute to the spread of infection.

10.28 No single test can be relied upon to provide the whole picture and trends rather than individual readings are most useful. Areas such as theatres, positive and negative pressure rooms, sterile preparation areas in pharmaceutical facilities, sterile services etc. will have specific guidance for testing regimens. These are used mainly to determine that the area is fit for the desired purpose. In the event of any problem, these records are useful to determine investigation pathways.

10.29 Conditions likely to promote microbial contamination include high moisture levels in air, particularly when associated with high air temperature. Stagnant air, possibly through poor ventilation, can contribute to fungal contamination whilst excessive air turbulence can increase airborne particulate levels and contribute to the dispersal of micro-organisms.

10.30 The maintenance of the environment is important to ensure that areas are intact, functioning properly and in a state such that they can be cleaned properly.

10.31 Water testing in a variety of situations (e.g. endoscope washer-disinfectors and steam for autoclaves) may require chemical and endotoxin testing as well as tests for conductivity and hardness.

10.32 Visual inspection must be part of physical monitoring to ensure for instance that filters are fitted correctly, that surfaces are smooth, impervious, free of cracks and joins, and without the accumulation of dust which may harbour fungi and bacteria.

Microbial monitoring

10.33 In terms of quality assurance, microbial sampling of the air, water and surfaces of the healthcare facility has an important role to play in helping combat the spread of infection within the built healthcare environment. NHS Healthcare Bodies should have a formal protocol for the monitoring of the built healthcare environment with regard to the control of infection. When sampling of the area is carried out, the laboratory should have appropriate accreditation for carrying out the sampling. Some sampling may have to be performed in response to an investigation of an outbreak of infection. Results obtained should be interpreted using scientifically established baseline values for comparison e.g. Health and Safety Executive guidelines. On completion of analysis, actions to be implemented should be based on the results obtained.

10.34 The microbial monitoring protocols should be developed by the Infection Control Team, with input from other disciplines and bodies as appropriate. Areas where the built environment is suspected of contributing to the spread of infection or where construction or refurbishment work is proposed, should be referred to the Infection Control Team for consideration of monitoring and advice as appropriate.

10.35 Helpful advice is available from the United States in the CDC publication 'Guidelines for Environmental Infection Control in Health-Care facilities'. This document states that biological monitoring of the healthcare facility should occur in the following four situations (CDC 2003):

- to support the investigation of disease or infection where environmental reservoirs or fomites have been implicated epidemiologically in the transmission of the disease or infection;
- for research purposes to provide information on the spread of infection within the built healthcare environment;
- to monitor a potentially hazardous situation;
- for quality assurance purposes as part of a quality control programme or to evaluate a change in prevention and control of infection.

10.36 Microbiological and other methods of sampling have an important role to play in training and education of healthcare staff.

Methods of microbial sampling

10.37 There are several types of microbial sampling methods. Conventional culture methods of microbial diagnosis are generally restricted by the amount of time it takes for qualification or quantification to occur. Culture techniques take a minimum of 18 hours to carry out and in some instances can take as long as 6 weeks.

10.38 There are a variety of methods and media available but many are poorly assessed and validated. In many circumstances there are no standards or set protocols for testing. Contact plates, swabs, enrichment versus selective media

and sensitivity of the method needs to be assessed in order to allow interpretation. It is important to know why the sampling is being carried out and the procedures to be implemented if abnormal results are found. Environmental sampling can place a heavy burden on clinical laboratories which may not be set up, funded or accredited for non-clinical sampling.

10.39 Non-culture techniques do not require pathogen multiplication and can be a more rapid method of detection. These methods are being utilised with increasing frequency, including techniques such as:

- antigen detection techniques e.g. Elisa;
- toxin detection techniques e.g. endotoxin assay;
- ATP(Adenosine Tri-phosphate) detection techniques e.g. bioluminescence, used in the food industry as a rapid hygiene test for surfaces;
- residue protein detection tests (ninhydrin tests);
- soil tests;
- cleaning efficacy tests;
- molecular techniques.

External specialist advice in the use of these and other rapid techniques is likely to be necessary.

10.40 Special consideration should be given to specialised areas such as control of Legionella. There is often specific guidance on such areas such as:

- Scottish Health Technical Memorandum (SHTM) 2040: 'The control of Legionellae in healthcare premises - a code of practice';
- Health and Safety Executive (HSE) guidance note L8 'Legionnaires Disease: The control of legionella bacteria in water systems. Approved code of practice and guidance'.

11. Operation/on-going maintenance

Importance of maintenance

11.1 Good design and equipment selection will ensure future maintenance is easy and cost effective. A planned maintenance system should be set up to start at the same time as handover or occupancy. A record of Planned Preventative Maintenance needs to be kept. Regular reviews of the building fabric should be undertaken as accidental damage to smooth surfaces makes effective decontamination difficult to achieve. The use of soft, difficult to decontaminate fabrics must be, as far as possible, avoided.

Access for maintenance

11.2 Where practical, maintainable elements should be located in separate plant rooms with easy access to plant and final connection through walls into clinical areas. Plant and services should be located behind panels that should be easily accessed with quick release fixings. Care should be taken when running services on the surface to avoid ledges where dust can collect. Equipment should be serviced *in-situ* where this helps to avoid cross infection. If equipment has to be removed from the area, consideration should be given to decontamination before and after servicing has been carried out.

Catering/food hygiene

11.3 All healthcare establishments must comply with requirements in the Food Safety Act 1990 (Scotland) and food hygiene regulations made under this Act. Reference should also be made to the Cook Chill Guidelines (DoH, 1989) and any other relevant legislation.

Ancillary areas

11.4 It is important that ancillary areas are of an appropriate standard and do not put the user at risk of cross-infection.

11.5 The evidence used is based on guidance from NHS Estates, England. Prevention and control of infection issues will depend on:

- the use of the ancillary area;
- who will have access; and
- the type of activity to be carried out there.

11.6 Ancillary areas include:

- dirty utility/sluice;
- clean utility/sterile products;
- treatment room;

- disposal room;
- day room/patient waiting area;
- play area;
- nappy-changing area;
- visitors toilets.

Dirty utility room

11.7 A dirty utility room should include facilities for:

- the cleaning of dressing trolleys and other items of equipment;
- testing urine;
- disposal of liquid waste; and
- temporarily holding items requiring reprocessing or disposal.

11.8 Space and facilities for holding and reprocessing of bed-pans, urinals and vomit bowls are required where in-patients are looked after (further guidance can be found in SHTM 2030: 'Washer Disinfectors'). Central Decontamination Units (CDUs) returns can also be held here, along with storage of sani-chairs, commodes and linen bag carriers.

11.9 Hand-hygiene facilities are necessary plus the provision of a 'slop-hopper' for disposal of body-fluid waste (SHPN 04: 'In-patient accommodation - options for choice') and a separate deep sink for decontaminating nursing equipment.

Clean utility room

11.10 A clean utility room is required where drugs and lotions may be stored and prepared. A working supply of clean and sterile supplies may be held and dressing trolleys prepared. Clinical hand-hygiene facilities are required.

11.11 In primary care facilities, the room should be located adjacent to the treatment area. It is important that planners think about the type of storage facilities provided; there must be sufficient storage area for sterile supplies equipment and other clean supplies to keep supplies off the floor. They must be able to be cleaned easily and quickly while protecting clean stores and equipment from dust and contamination.

11.12 Sterile and clean supplies should be stored away from any source of water splashing. Suitable storage will ensure packaging is not damaged while accessing supplies.

Treatment room

11.13 A treatment room may be required for in-patient examination or investigations on the ward. It will certainly be needed in primary care settings and will require different design features according to its planned use. For example, in areas

where immunisation, redressing or surgical intervention and investigations take place the following points should be considered:

- adequate numbers of hand-wash basins should be provided;
- space should be available to allow for the storage of equipment and sterile supplies;
- carpets should be avoided.

Disposal room

11.14 The disposal room is the temporary storage point for all items of supplies and equipment which have to be removed for cleaning, reprocessing or disposal, e.g. linen, reusable medical devices.

Day room/patient waiting area

11.15 There is often conflict between the aesthetics of these areas and the prevention of contamination of the environment or furnishings. This is especially the case in waiting areas such as in Accident and Emergency departments, primary care and minor injury units (SHPN 04: 'In-patient accommodation - options for choice').

11.16 It is important that where blood and body-fluid spillages may occur, the environment should be able to be cleaned so that micro-organisms do not survive and should be able to withstand the use of high concentrations of aggressive disinfectants.

11.17 Flooring should be cleanable and be able to withstand the use of detergents and disinfectants. Carpets are not recommended where spillage is anticipated.

Play area

11.18 There are prevention and control of infection implications for toy cleaning (i.e. how they should be effectively cleaned) and storage (i.e. the provision of adequate toy storage facilities) plus issues for cleaning equipment and multiple use areas such as soft play areas and play mats.

11.19 Porous or fabric toys should be avoided, as they cannot easily be decontaminated on site.

Nappy-changing area

11.20 Provision of a nappy-changing area is a necessary addition to any healthcare premises.

11.21 Facilities for disposal of soiled nappies and for hand-hygiene are required along with a regular cleaning programme for equipment used.

11.22 The area for nappy-changing should have a surface which can be easily cleaned.

Visitors' toilets

11.23 These are heavily used and should provide sufficient space and be of a high grade of finish to maintain a good standard of hygiene.

11.24 There should be provision of disposal facilities for sanitary waste in both women's and mixed-sex toilets.

11.25 The number of toilets and hand-wash basins provided must be sufficient for the anticipated population.

Recommendations

11.26 Ancillary areas provided as part of a ward, department, primary care facility or community home must be easily accessible, fit for the purpose and safe, both from a health and safety perspective and a prevention and control of infection perspective.

11.27 The prevention and control of infection issues in an ancillary area must be included along with other design features and will depend on what the ancillary area is to be used for, who will have access, and what type of activity will be carried out there.

11.28 Ancillary areas must be easily cleaned, have facilities for hand-hygiene, disposal of fluid and clinical waste, if appropriate, and sufficient storage for supplies and equipment.

11.29 Clean and dirty areas must be kept separate and the workflow pattern and management of each area must be clearly defined.

Cleaning frequency/quality

11.30 The ability to effectively maintain a clean environment is essential in the planning and design stage of any new facility. This applies to the general fabric of the building, along with the equipment selected.

11.31 Cleaning of all fixtures, fittings and equipment should be managed by way of planned cleaning schedules, based on routine cleaning frequencies. This will not only ensure a clean environment but will also extend the working life of the facility.

11.32 In addition to the cleaning frequency schedules, attention must be given to ensuring that appropriate staff training is carried out.

11.33 In order to maintain a facility in good condition, the design must allow for protection to walls which can regularly be subject to repeated damage from trolley traffic. Plans should also be made at an early stage to have the area included on the routine maintenance programme in order to maintain a high standard and minimise deterioration of the fabric. (Further guidance can be found in the NHSScotland National Cleaning Specification produced by the HAI Task Force.)

Ventilation

11.34 Ventilation should dilute airborne contamination by removing contaminated air from the room or immediate patient vicinity and replacing it with clean air from the outside or from low-risk areas within the healthcare building.

11.35 The ventilation must be sufficient to maintain a comfortable environment for staff and prevent the premises and equipment from overheating. Artificial ventilation systems must be constructed to permit access for cleaning and maintenance. Conditions which give rise to condensation should be avoided as condensation will encourage the growth of mould.

11.36 Care should be taken when servicing ventilation systems as air-flows and pressure changes can allow contamination of clinical areas. Dust or contamination in the ductwork or within the plant rooms can find their way into the system. Fire dampers should be of the self-resetting type to avoid accidental disruption of airflow. Filters need to be changed at regular intervals and care needs to be taken to avoid contamination of the system due to overloaded filters collapsing. Regular checks of the ductwork and diffusers should form part of the maintenance plan. Microbiological monitoring and commissioning of specialised ventilation should be in accordance with guidance in SHTM 2025: 'Ventilation in healthcare premises'. Ventilation systems should be designed to allow removal of filters without contaminating filtered air space.

Ventilation in the clinical setting

11.37 Research has suggested that in specialised areas, ventilation can reduce the incidence of healthcare associated infection such as wound infections and communicable diseases (Ayliffe et al, 2000; Sanchez and Hernandez, 1999; Fox, 1997; O'Connell and Humphreys, 2000; Holton and Ridgway, 1993; Humphreys, 1993).

11.38 Effective ventilation in healthcare premises involves the dilution of the airborne contamination by removing contaminated air from the room or immediate patient vicinity and replacing it with clean air from the outside or from low risk areas within the healthcare building. The use of specialised ventilation systems mainly relates to high risk units such as operating theatres, special care baby units, burns units, high dependency and intensive care units and areas such as isolation rooms (negative pressure ventilation for infectious patients and positive pressure ventilation for immuno-compromised patients).

11.39 NHSScotland Property and Environment Forum's SHPNs and SHTMs along with Codes of Practice for design of buildings give advice on 'natural' ventilation, general extract ventilation and ventilation for specialised areas such as operating theatres, hydrotherapy suites, isolation rooms and are referenced under the respective specialised areas.

11.40 Wound infection has traditionally been a major cause of morbidity resulting from surgical procedures. Improvements such as ultra-clean theatre ventilation have contributed to reduced morbidity and mortality in specialised areas such as orthopaedics (Lidwell et al, 1982).

11.41 Airborne infections have been associated within treatment areas where patients are immuno-compromised, for example haematology wards, bone marrow transplant units (Alberti et al, 2001; Sherertz et al, 1987).

Cost implications

11.42 In some clinical areas, the decision to install sophisticated ventilation systems which need routine or constant monitoring must be balanced against the risks and costs of such controls. The evidence on which to base the risk analysis is usually either absent or controversial. Where air movement is induced by mechanical ventilation, the flow of air must be from clean-to-dirty areas (where these can be defined). Hoffman et al (1999) state that "*investment in mechanical air systems is large and as with many other areas of infection control, it is difficult to measure their true effectiveness when such a measure would be the absence of sporadic events implicating a failure of the system*".

Control and containment of infection

11.43 Ventilation of healthcare premises is considered in SHTM 2025: 'Ventilation in healthcare premises' which includes discussion of airflow and filtration:

- Humphreys (1993) states that whenever airborne infection is possible in theatres, the airflow must go from clean to contaminated areas, and not the opposite way;
- Isolation rooms can be equipped with appropriate ventilation, i.e. negative or positive air pressure (but preferably not both);
- information on planned maintenance of ventilation systems should be available (see NHSScotland Property and Environment Forum's SHTM 2025: 'Vol. 4 – Operational management');
- ultra-clean ventilation systems in operating theatres can reduce airborne contamination and subsequent wound infections more effectively in specialised areas such as orthopaedics;
- Wagenvoort et al (1993) demonstrated the problems associated with intermittent interruption of electricity to ventilation systems which shuts the system down briefly.

Clean air and ventilation systems

11.44 Controlling airborne infection in relation to prevention of cross-infection in healthcare buildings remains a controversial subject. Hoffman et al (1999) divided the acute ward environment into:

- the 'true environment', which comprises those organisms normally found in any non-hospital environment, for example fungal spores; and
- the 'special hospital environment' which consists mainly of organisms arising from patients, staff and visitors, for example tuberculosis.

11.45 The relative incidence of airborne infection in hospitals has been estimated to be about 10% (Schaal, 1991). However, this does not take into account such

factors as local respiratory pathogens, susceptibility of patients, climatic conditions, construction work, ventilation equipment and organisational policies in individual hospitals or wards.

11.46 The Control of Substances Hazardous to Health Regulations (COSHH) (1999) state that:

"Exposure to a biological agent shall be adequately controlled by designing work processes and engineering control measures so as to prevent or minimise the release of biological agents into the workplace."

11.47 The COSHH Regulations require work processes to be safe by design. However, in some cases such as multi-drug-resistant tuberculosis (MDRTB), both ventilation and Personal Protective Equipment (PPE) will be required.

11.48 Shutters, access doors or air direction slats, if fitted, should be easily accessible for cleaning or removal.

Heating

11.49 A heating element is likely to be an integral part of the ventilation system and should be easily controlled and maintained. Natural convection currents caused by heat loss needs to be considered when calculating airflows and direction of airflow.

Heating/temperature control

11.50 Special consideration should be given to the type of heating, cooling and general ventilation systems provided in patient care and clinical areas. The heating and ventilation strategy should be appropriate for the setting.

Heat emitters (radiators)

11.51 NHSScotland Property and Environment Forum's Scottish Health Guidance Note: ''Safe" hot water and surface temperatures' provides guidance on how to prevent patients burning themselves on heat emitters.

11.52 The SHGN recommends options to ensure safety as follows:

- guards/covers should be fitted;
- low surface temperature heat emitters should be used;
- temperature controls should fail to a safe position.

11.53 Of these options, covered heat emitters have raised the most prevention and control of infection concern. Heat emitter covers allow dust to build up beneath and inside the heat emitter grille. This dust has been found to contain MRSA (meticillin resistant *staphylococcus aureus)* and other potentially pathogenic organisms, and when heat emitters are switched on during the winter months, dust and bacteria are dispersed by heat convection to the ward area.

11.54 Where heat emitter covers are used, regular planned maintenance and cleaning should be undertaken to prevent the problems described.

11.55 When installing heat emitters, it is recommended that there be adequate space underneath the heat emitter to allow cleaning machinery to be used. These areas may suffer from a lack of planned maintenance and cleaning and, as such, can become heavily contaminated with dust and potentially pathogenic organisms.

Pipework siting and access

11.56 'Hidden' heating may provide a solution to the problems of cleaning as long as access is possible for regular planned maintenance and cleaning. Pipework running along a wall can easily trap dust. Pipework mounted on walls should be encased to facilitate easy cleaning.

Heating and ventilation grilles and diffusers

11.57 General heating/ventilation grilles and diffusers need to be accessed easily for inclusion in cleaning programmes by domestic staff. When infection outbreaks occur, it is essential that these fixtures and fittings are included in the remedial cleaning process. Therefore, the ability for them to be easily removed and cleaned away from the patient area is essential in limiting cross contamination. Cotterill et al (1996) and Kumari et al (1998) describe outbreaks associated with general ventilation grilles in an intensive care unit and an orthopaedic ward.

Supply and extract ductwork

11.58 Supply and extract ductwork should be installed in such a way that it can be accessed at pre-defined regular intervals and cleaned along their full length including all components.

Ceiling or wall mounted air-conditioning units

11.59 These can be extremely difficult to clean due to the fact their interstices can get very dusty. Any decision to install them should be taken with great caution and the need to close the ward/department to enable satisfactory cleaning to be undertaken also needs to be considered. Their use in high-risk areas should be undertaken with caution.

Water systems

Wash facilities

11.60 Due to the difficulty of cleaning of baths after each patient, showers are generally more acceptable to both patients and infection control personnel. However, showers have been implicated in outbreaks of infection due to *Legionella* spp. (Tobin et al, 1980). Such problems, however, can be minimised by proper planned maintenance.

11.61 WCs, bathrooms and showers should be designed and installed to aid cleanliness and prevent cross-contamination. Toilet facilities must have facilities for hand-hygiene and SHPN 4: 'In-patient accommodation - options for choice' recommends that they should be no more than 12 metres from the bed area or dayroom.

11.62 Claesson and Claesson (1995) documented an outbreak of endometritis in a maternity unit caused by spread of *S. pyogenes* (sometimes referred to as Group A *streptococci)* from a showerhead and their conclusion was that showers, when used to clean the perineum following childbirth, pose a definite risk for post-partum endometritis. Again, proper planned maintenance should minimise this risk.

Protection of immuno-compromised patients

11.63 For areas with patients who have lowered immune responses, water fittings (washers, etc) should not support microbiological growth. Guidance can be sought from the Water Regulations Advisory Scheme (WRAS) (2001) 'Water Fittings and Materials Directory' and from BS 6920-1:2000 'Suitability of non-metallic products for use in contact with water intended for human consumption with regard to their effect on the quality of the water'.

11.64 Patients who have a lowered immune response are at risk from certain organisms found in water supplies in hospital, and as such, will need to be protected from this problem both in drinking water and wash-water facilities. Steinert et al (1998) and Miyamoto et al (2000) discuss the effects of plumbing systems on *Legionella* spp. in hospital hot-water systems and methods of disinfecting.

11.65 Graman et al (1997) demonstrated how an outbreak of healthcare associated legionellosis was traced to a contaminated ice machine. Manangan et al (1998) produced guidance on the sanitary care and maintenance of ice-storage chests and ice-making machines in response to the problems and requests for guidance from infection control professionals. Guidelines were also produced by Burnett et al (1994).

11.66 In another incident with an ice-making machine, an MDA Hazard Notice (Hazard (93) 42), was circulated following a report that leukaemia patients receiving chemotherapy treatment had developed septicaemia as a result of infection with *Stenotrophomonas maltophilia*. The source of this infection was traced to the storage cabinet of the ice-making machine in the ward. The Notice gave guidance for immediate action to ensure that ice is made directly from water that is of drinking quality.

11.67 Ice for the immuno-compromised should be made by putting drinking water into single-use icemakers, then into a conventional freezer.

11.68 Bosshammer et al (1995) carried out comparative hygienic surveillance of contamination with *Pseudomonas* spp. in a cystic fibrosis ward over a four year period and demonstrated how segregation of colonised and non-colonised

patients was undermined through transfer of strains from a highly contaminated environment, that is, taps, sinks and wash basins.

11.69 Sniadack et al (1993) demonstrated how a pseudo-outbreak of *Mycobacterium xenopi* was attributable to exposure of clinical specimens to tap-water. This included rinsing of bronchoscopes with tap-water after disinfection; irrigation with tap-water during colonoscopy; gargling with tap-water before sputum specimen collection and collecting urine in recently rinsed bed-pans.

11.70 Showers have been implicated in outbreaks of legionellosis in a transplant unit (Tobin et al, 1980) and on an alcoholism rehabilitation ward (Burns et al, 1991).

11.71 Water has been implicated in outbreaks not only from drinking water sources but also when it has been used for processing specimens in equipment such as dialysis machines.

Wastewater

Wastewater and sanitation

11.72 Domestic sewage contains a large number of intestinal organisms and is therefore hazardous. It must therefore be disposed of via a safe system internally to the external wastewater sewerage systems for treatment.

11.73 This waste will include water and body fluids from sanitaryware such as toilets and bidets plus drainage systems from mortuary tables and waste disposal systems and washer-disinfectors.

11.74 Wastewater is generated from a huge number of tasks carried out in healthcare buildings, which range from domestic cleaning, hand-hygiene, specialised laundries, surgical operations and areas such as renal dialysis units. Most of the wastewater contains micro-organisms from blood and body fluids and therefore has the potential for cross-infection if not disposed of safely.

Sanitary facilities

11.75 These not only include WCs and bidets but also equipment to assist patients who are unable to use a WC such as commodes and bed-pans, plus the equipment to disinfect this equipment such as bed-pan washer-disinfectors and macerators. The importance of cleaning in and around sanitary areas has also been shown in investigations of outbreaks caused by *Clostridium difficile* (Zafar et al, 1998; Cartmill et al, 1994. (Further guidance on cleaning can be found in NHSScotland National Cleaning Specification produced by the HAI Task Force.)

11.76 Healthcare facilities have recently seen increasing numbers of patients with *C. difficile*, vancomycin-resistant enterococcus (VRE) and diarrhoea and vomiting due to small round structured virus (SRSV). The degree of environmental contamination appears to be a determining factor in healthcare associated infection with sanitary facilities acting as ‘hot spots’ for transmission.

Internal drainage system

11.77 An internal drainage system must use the minimum amount of pipework, retain water and be airtight at joints and connectors. It must be sufficiently ventilated to retain the integrity of water seals.

11.78 The design should comply with the relevant British Standards and Codes of Practice, including BS EN 12056 and the current Building Regulations. Recommendations for spatial and access requirements for public health engineering services are contained in CIBSE (Chartered Institution of Building Services Engineers) Guide G, 1999 and SHTM 2023:'Access and accommodation for engineering services'.

11.79 Provision for inspection, rodding and maintenance should be located to minimise disruption or possible contamination and manholes should not be sited within the building.

Waste disposal sinks

11.80 Sufficient and suitably located waste disposal sinks, for example slop-hoppers, should be provided to prevent contamination of hand-wash basins by disposal of wastewater.

Bed-pan washer-disinfectors/macerators

11.81 Where reusable bed-pans are used, ward areas require adequate and suitable bed-pan washer disinfectors that comply with SHTM 2030: 'Washer-disinfectors'. Wards housing certain specialised areas, for example urology wards, will need more than one bed-pan washer-disinfector. It should be noted that new BS and EN guidance will be issued on bed-pan washer-disinfectors.

11.82 Individual assessment of need should be made, as a uniform policy may lead to some areas being under-resourced. This also applies to the provision of macerators where disposable systems are used. Where macerators are used, there should be facilities to wash-disinfect bed-pan holders.

11.83 Rutala and Weber (1999) detail the role of disinfection and sterilization and discuss sanitary equipment in what they term 'non-critical item decontamination'. With the emergence of Vancomycin Resistant Enterococcus (VRE) as a healthcare associated pathogen during the past five years, urine containers and bed-pans have been implicated in outbreaks (Bonten et al, 1996).

11.84 Control or containment of these outbreaks depends on many factors, but not least the safe disposal of wastewater and sanitation and cleanliness of the equipment/environment.

11.85 Where fitted, bed-pan washer-disinfectors should be installed according to the Water Supply (Water Fittings) Regulations 1999 to prevent backflow and contamination.

Lighting

11.86 Lighting should be planned so that lamps can be easily cleaned with no edges or ridges where dust can gather. Lighting including emergency lighting should be maintained in good working order and maintenance records kept. Care needs to be taken when removing the diffusers as this is likely to disturb dust and may lead to contamination of the clinical area. Regular cleaning of these fittings in clinical areas should form a part of the Maintenance Plan.

11.87 Lighting levels should be maintained according to the recommendations for specific areas such as wards (day and night), theatres, corridors, examination rooms, ancillary or utility rooms and specific areas such as critical care units so that observation of patients is achieved without glare (SHTM 2007: 'Electrical services, supply and distribution'). Additional task lighting needs to be provided in certain areas.

11.88 Location and design of luminaires should afford easy changing of lamps and frequent cleaning. They should be designed so that there are no ledges, ridges, etc. where dust can gather easily, build up and then be dispersed if the light is knocked or moved.

11.89 Light quality is as important as quantity and may help avoid mistakes such as invasive injuries during operative procedures or examinations.

11.90 Efficient lighting in all areas of wards or departments enables domestic staff to undertake cleaning more effectively.

Transportation

Movement/transfer of an infectious patient

11.91 Additional precautions should be observed and maintained when transferring a patient with an infection throughout the healthcare facility and during ambulance transport. It is important to limit movement and transportation of the patient only to that required for essential purposes.

11.92 If a patient is to be transferred it is essential to inform the receiving area of required precautions prior to patient transportation. Traffic in isolation/segregation areas should also be minimised.

Environmental control

11.93 Control of the physical environment includes monitoring parameters such as temperature, humidity and air change rates. Where practical, the environmental controls should be linked to a building management system capable of continual monitoring. Where this is not practical then regular testing of the system, appropriate to the application, will be required with appropriate records being kept.

Electrical supply and distribution

11.94 Guidance on supply and distribution can be found in SHTM 2007: 'Electrical services, supply and distribution'. Guidance on installation and testing is laid down in the current I.E.E. Regulations and should be followed with appropriate records being kept. Responsibility for ensuring commissioning and testing is carried out correctly lies with the building owner/occupier.

Bedhead services/patient entertainment

11.95 Bedside patient entertainment and communications systems may be provided by private companies.

11.96 The beside entertainment units are located in the wards at each bed. Cleaning of these units must comply with prevention and control of infection requirements and be approved by Infection Control personnel.

11.97 To this end, bedside entertainment units should be specifically designed with the healthcare facility environment in mind. All surfaces should be smooth, allowing effective cleaning with no areas that allow dirt to be trapped.

11.98 The system should allow each bedside entertainment unit cleaned to be logged, so that a detailed account of frequency and adherence to the cleaning specification is maintained.

11.99 A cleaning specification must be in place to ensure compliance with the Prevention and Control of Infection Procedures for cleaning areas and equipment in isolation rooms or bed areas where patients have a known infection. (Further guidance can be found in the NHSScotland National Cleaning Specification produced by the HAI Task Force.)

Medical gases: access and accommodation for services

11.100 Vacuum and suction equipment is a potential cross-infection risk. The delivery system is similar to that of gases, i.e. piped or via mobile equipment. The vacuum pipe system must be able to be isolated in case of incidents where pipework becomes contaminated with blood/body fluid. Contamination of piped vacuum systems can cause problems for Estates personnel. Access to the pipework may involve removal of the wall and ceiling fabric. The use of vacuum controlled units with overflow protection devices is essential to avoid contaminating the system with aspirated body fluid.

11.101 Guidance on the routine maintenance of Medical Gas equipment is laid down in SHTM 2022: 'Medical Gas Pipeline Systems'. SHTM 2022 gives guidance regarding piped medical gases and vacuum systems, and includes recommendations on:

- emergency procedures;
- power failure;
- access for cleaning contaminated vacuum systems;

- training and communication;
- maintenance and infection risk.

11.102 In some instances, surface mounted containment of pipework is unavoidable. If this is the case, regular cleaning of high-level ledges should be undertaken. Should any carry-over of body fluids occur within the piped vacuum system, advice should be sought from infection control. Again record keeping is critical for these services. Before carrying out any maintenance work on vacuum systems and/or changing bacterial filters, the Infection Control Team should be informed so that advice can be given on any appropriate precautions to be observed.

Lifts

11.103 Routine maintenance of lifts is covered by SHTM 2024: 'Lifts'. Regular cleaning of the car should be undertaken, however, care should be taken during this procedure to isolate the automatic call function. Record keeping is critical for this service.

Laundry facilities

11.104 There should be separate storage areas for both clean linen and the storage of linen awaiting collection or laundering (see SHPN 04: 'In-patient accommodation - options for choice').

11.105 Due to the working environment for staff, professional advice needs to be taken from a number of authorities namely, Infection Control, Estates, Health and Safety, Fire Safety and Occupational Health.

11.106 Laundry requires to be thermally disinfected during the laundering process. Laundry from hospitals and healthcare facilities may be contaminated with blood or body fluids and may have been used on infected patients.

11.107 Segregation of linen is of the utmost importance to prevent cross contamination when it comes to dealing with laundry. Clean and dirty areas must be well controlled.

11.108 Linen requires segregation into four categories:

1. Used linen.
2. Soiled linen.
3. Infected linen, which should be placed in a water-soluble liner or bag before being placed into a laundry bag.
4. Heat labile linen.

11.109 Procedures must be in place to ensure all staff are trained in segregation within the ward/department and the laundry to ensure that there are safe work practices for handling of laundry.

11.110 When designing a healthcare laundry there should be clear workflow patterns in order that there is no cross over from clean to dirty areas. Dirty linen should come in and be able to be stored, short term, and then taken to be washed with the process continuing to the end of production, where a clean storage area will be available. It must be easy to identify which area of the laundry staff work in e.g. colour-coded uniforms.

Equipment

11.111 The correct choice of laundry equipment is important in order that thermal disinfection takes place during the laundering process i.e. that the correct temperatures are reached, and machinery must be maintained and calibrated regularly.

Cleaning

11.112 Space must be available around machinery, and safe access available to laundry and domestic staff, to allow the correct standards of cleaning to be maintained.

11.113 The laundry environment encourages dust and debris to develop and must be cleaned on a regular basis.

Ventilation

11.114 The ventilation strategy for a laundry facility should take into account the heat and dust generated in parts of the facility. Mechanical cooling should only be provided where other means of limiting temperature rise have been assessed and rejected on the basis of a full life-cycle cost analysis basis. The ventilation strategy must minimise the level of airborne contamination and dust and minimise the risk of cross infection.

Staff facilities

11.115 Hand hygiene facilities must be available throughout the laundry so that staff have access to this at all times during their working day. Adequate staff changing facilities with shower rooms should also be available in the event of spillage or contamination.

Waste handling

11.116 Waste is a major issue within the healthcare environment and there are many legislative controls and guidelines for the management of waste, to protect patients, visitors, staff and contractors working within this environment. (Further guidance can be found in SHTN 3: ‘Management and disposal of clinical waste’.)

11.117 Good design of waste management processes can minimise problems with waste segregation, storage and disposal.

11.118 This part of the document discusses the problems of waste management and the guidance which must be adhered to if patients, staff and contractors are to be protected. The reality is that the disposal of waste is often poorly managed and inadequately catered for in wards, departments and community healthcare establishments and this can lead to escalating costs and heightened risks to healthcare staff.

11.119 Following a study of hospital waste management on 13 hospital sites, the Audit Commission (1997) stated that on average an acute hospital of 500 beds produces over 10 tonnes of waste per week. Some of the waste, such as paper, food scraps, flowers and bottles, is disposed of into the household waste stream and costs between £20 and £70 per tonne. The rest consists of clinical waste and special waste and costs considerably more to dispose of, typically between £300 and £500 per tonne.

11.120 Areas discussed include:

- identification/segregation;
- disposal/clinical bins;
- hospital waste;
- community waste;
- construction waste;
- final disposal;
- clinical implications.

Identification/segregation

11.121 Identification of categories and the means of segregation of clinical and special waste form the key elements of a waste disposal strategy. Waste is a risk not only to healthcare staff but also to their colleagues, patients, visitors and contractors. Increasing costs, litigation and damage to the environment are also areas for concern.

11.122 The means of segregation will depend on the ratio of clinical waste to non-clinical waste. Space at the ward/unit level is needed for suitable waste containers, whether the area served produces large or small amounts of clinical waste and household waste. Bins must be supplied in the appropriate areas according to amounts produced.

11.123 Current strategies for clinical waste management are outlined in SHTN 3: 'Management and disposal of clinical waste' along with the present legislative and regulatory framework and guidance. It should be noted that at the time of writing, waste legislation is changing rapidly.

Disposal/clinical bins

11.124 Clinical waste bin lids sustain the heaviest bacterial contamination and need to be capable of being suitably cleaned and disinfected, therefore, the use of bins with sack holders to allow for adequate cleaning is recommended.

11.125 Bins should be foot-operated only, and the foot pedal should be sturdy and durable.

Hospital waste

11.126 Storage in large 'Eurobins' in hospital streets (corridors) has been used for clinical waste. However, Eurobins are unsightly and should be removed where possible. Therefore, any new developments should allow for secure disposal storage cupboards sited at the entrance to the ward or department, preferably with access from both ward and hospital street. Waste can then be stored in this area instead of cluttering up dirty utility rooms, which are often inadequate for this purpose, while awaiting collection by the portering staff.

11.127 These rooms can be combined with those for soiled linen and household waste, but must be clearly subdivided so that the three types of waste are separated from each other. This will assist rapid collection and should minimise the risks of items for reprocessing being accidentally taken for disposal by incineration.

11.128 The subdivided areas must be able to be cleaned in the event of spillage and must be able to contain any spillage that does occur. The hold area should be large enough to hold a wheelie-bin or similar depending on the waste management strategy chosen, which in turn would reduce handling and the subsequent risks to porters. A designated, secure collection bay is also necessary to hold bins until waste is either incinerated/compacted/treated on-site or transported off-site for incineration.

11.129 Staff handling of waste sacks after removal from waste bins must be avoided and any decanting of waste into larger bins must be automated where possible to minimise manual handling risks.

Community waste

11.130 In healthcare facilities such as nursing/residential homes and primary care settings, all waste must be contained in bags inside a lockable container.

11.131 The system and frequency of collection of waste for the particular area needs to be taken into account when planning facilities for temporary holding bays, etc. If located externally, the holding bay or bin must be washable, secure and rodent-proof.

11.132 There must be a strict routine for removing waste to ensure it does not remain uncollected for extended periods. Further guidance is given in SHTN 3: 'Management and disposal of clinical waste'.

Construction waste

11.133 Each year in the UK, 70 million tonnes of waste are produced by the construction industry and for projects attached to existing healthcare facilities this can cause considerable risk to highly susceptible patients. It is important that this dust and debris are controlled and disposed of safely.

11.134 Barrier systems must be erected and closed waste containers supplied as necessary to avoid contamination of occupied areas.

11.135 Traffic control through designated entry and exit areas and dedicated lifts should be identified, if possible.

11.136 The management and minimisation of construction waste must be designed into the project.

Final disposal

11.137 Space at the ward/unit level is needed for provision of suitable secure waste containers, whether the area served produces large or small amounts of clinical waste. The storage facilities provided will vary with the type of healthcare facility and method of final disposal.

11.138 Final disposal is mainly achieved by the use of commercial, high temperature incinerators capable of meeting the increasingly tight emission limits set out by UK regulations.

11.139 Under the Environmental Protection Act 1990, certain types of clinical waste such as pharmaceuticals and chemicals must be incinerated at high temperature. However, much of what is usually designated as 'clinical waste' does not necessarily have to be burned but must be rendered safe.

11.140 Current strategies for clinical waste management are outlined in SHTN 3: 'Management and disposal of clinical waste' with the present legislative and regulatory framework and guidance. The Audit Scotland Baseline report (2001) entitled 'Waste Management in Scottish Hospitals' and the subsequent follow up report (2005) also contains an overview of waste management strategies.

11.141 In the past, in many cases, waste management has not been given the priority it requires and is still, in some cases, poorly handled and catered for within healthcare premises, both in the acute and the primary care setting. Thought must be given to adequate storage facilities for waste in a new build and when upgrading is taking place.

11.142 There are various categories of waste i.e. household waste going into the landfill waste stream, and such waste going for recycling or indeed confidential waste for destruction and clinical waste which must be rendered safe by heat treatment and where body parts and special waste are for disposal then this must be by incineration. (National contracts are in place meeting legislative compliance.) Thought must also be given to recycling particularly paper waste, which makes up a high percentage of our waste.

11.143 There must be appropriate space at ward level for suitable waste containers and multiple handling of waste should be avoided where possible. Dispose of waste as near to point of use as possible.

11.144 The correct number of bins should be in place for the amount and types of waste being produced and these bins should be foot operated and suitable to be cleaned and disinfected. Classification/guidance on types of waste and appropriate storage can be found in SHTN 3: 'Management and disposal of clinical waste'.

11.145 Storage areas for waste should be at the entrance to a ward or department with easy access for portering staff to pick up, not in dirty utility rooms, which in existing establishments do not provide enough space. Ideally these areas should be able to store wheelie bins, sharps boxes, magpie boxes for glass and aerosols, dirty linen in order that all waste is in one place, easily identifiable and easily collected by portering staff.

11.146 The storage area should be easily cleaned and spillages easily dealt with. For example, sheet vinyl on the floors and particularly covering the walls should be encouraged to avoid damage and contamination.

11.147 When waste leaves the storage area it should be taken to its final destination where it can be held in a designated storage bay before it is incinerated, compacted, treated on site or taken off site for incineration or heat treatment.

11.148 Within primary care and community settings, waste must be kept in a lockable container, bin store etc and the appropriate frequency of collection agreed at the time of planning the premises in order that the store is large enough to cope with the amount of waste generated.

11.149 As before, the area is required to be easily maintained and kept clean.

Access to decontamination facility

11.150 Access to the decontamination facility should be such that it does not contribute to the spread of infection. As such, there should be appropriate decontamination facilities provided centrally for decontamination of reusable medical devices and the system in operation should comply with the current guidance on decontamination facilities and procedures. Not all items reprocessed centrally will be sterilized, for some forms disinfection will be the end point.

Decontamination equipment

11.151 Decontamination is the combination of processes which include cleaning, disinfection and sterilisation used to render a reusable medical device safe for reuse on patients and for handling by staff. This part of the document discusses the importance of decontamination of reusable medical devices and the evidence which can be used as a useful checklist for planning areas in the built environment.

11.152 For maintenance and validation, follow the guidelines laid down by the Infection Control Manager and the relevant SHTMs; 2030, 2031 and 2010. Record keeping forms a critical part of the management of decontamination for these types of equipment.

11.153 The effective decontamination of medical devices is essential in reducing the risks to patients from healthcare associated infection and minimising the potential iatrogenic transmission of Transmissible Spongiform Encephalopathies (TSEs), that is, Creutzfeldt–Jakob Disease (CJD), variant Creutzfeldt–Jakob Disease (vCJD), Gerstmann–Sträussler–Scheinker Disease (GSS) etc.

11.154 At each stage in the decontamination process, consideration should be given to location, facilities, equipment, management and policies/procedures.

11.155 Areas discussed in this part of the document include:

- decontamination and healthcare associated infection;
- transmission of TSEs including vCJD;
- decontamination assessment tools;
- decontamination facilities and accommodation.

Decontamination and healthcare associated infection

11.156 It has been demonstrated that 10% of in-patients acquire a hospital acquired infection (now referred to as healthcare associated infection) at any one time (Plowman et al 1999), the most common being urinary tract infection, surgical wound and lower respiratory tract infection.

11.157 There are common risk factors which cause infection, but it is not known how many infections could be prevented by improving decontamination procedures; however, it is known that failure in decontamination processes can result in a range of infections.

11.158 Saksena et al (1999) reported that transfer of infectious material had been demonstrated in inadequately decontaminated instruments. Scottish Healthcare Supplies Hazard Notice (SC) 95/02, referred to water contaminated with *Pseudomonas aeruginosa* being used to flush the lumens of a microsurgical hand-piece, which subsequently suffered ineffective sterilization before use. Three patients who had undergone surgery at the same time were found to be infected.

11.159 The possibility that TSEs might be spread from person to person in healthcare situations may arise for a number of reasons:

- classical CJD has been transmitted from person to person by medical procedures;
- abnormal prion protein has been demonstrated in the lymphatic tissue (including tonsils) of patients with established vCJD;

- abnormal prion protein has been demonstrated in the appendix of a patient who subsequently developed vCJD;
- abnormal prion protein may not be inactivated by normal sterilization procedures.

11.160 Research which gave rise to these concerns includes the identification of the abnormal form of prion protein reported in the appendix removed from a patient some months before he went on to develop clinical signs of vCJD (Hilton et al, 1998). This was the first time that the presence of abnormal prion protein had been detected in peripheral tissues before the onset of clinical disease. Furthermore, in another study (Hill et al, 1999), lymphoreticular tissues (tonsils, spleen and lymph nodes) from patients with neuropathologically confirmed vCJD were found to be positive for the abnormal protein associated with prion diseases.

11.161 The Spongiform Encephalopathy Advisory Committee (SEAC), which advises the Government on BSE/CJD issues, has advised that rigorous implementation of washing, decontamination and general hygiene procedures are key measures in reducing the risk of vCJD transmission via surgery. A risk assessment model developed by the Department of Health (DH) at SEAC's request and updated in June 2005 confirms this: 'Assessing the risk of vCJD transmission via surgery: an interim review', available on the DH website at http://www.dh.gov.uk/assetRoot/04/11/35/42/04113542.pdf.

Decontamination facilities and accommodation

11.162 If decontamination is to be undertaken in a safe and effective manner which reduces risk and contributes to a reduction in healthcare associated infection, then it must be carried out in a suitable environment, with validated automated processes, managed and operated by trained staff.

11.163 Centralised reprocessing of surgical instruments is the preferred option and local reprocessing should be the exception rather than the norm. Accommodation provided for decontamination should be designed and operated in a manner that does not contribute to the overall bio-burden of the instruments being processed. SHPN 13: 'Sterile Services Department' provides advice and guidance on provision of central sterile supply accommodation. Where local provision is required then it must be carried out to the same standard as central reprocessing. Further information on Local Decontamination Units can be found on the Health Protection Scotland (HPS) website http://www.show.scot.nhs.uk/scieh/infectious/hai/decontamination/haidecon.htm

11.164 When designing clinical accommodation, consideration should be given to providing adequate and appropriate storage for centrally provided sterile supplies. If sterile supplies are stored inappropriately, then sterility can be compromised and contamination can occur.

Drainage

11.165 Care needs to be taken to ensure access for dismantling and cleaning of drainage if required. The use of glass traps will allow for monitoring of critical areas as necessary. Where it is important to maintain hygiene conditions within drainage systems, or integrity of water seals, regular flushing programmes should be implemented.

Sanitation

11.166 Regular maintenance of all sanitaryware is essential. Glazed surfaces free from cracks are easier to maintain. Care should also be taken where surface mounted equipment forms ledges at high levels which need to be cleaned regularly.

Environmental sampling

Physical monitoring

11.167 Physical monitoring of the healthcare environment including temperature, humidity, air change rates, leak rates, direction of air and water flow, particle counts, filter efficient testing methods, can help ensure that environmental conditions in the healthcare facility are such that they do not contribute to the spread of infection.

11.168 No single test can be relied upon to provide the whole picture and trends rather than individual readings are most useful. Areas such as theatres, positive and negative pressure rooms, sterile preparation areas in pharmaceutical facilities, sterile services etc will have specific guidance for testing regimens. These are used mainly to determine that the area is fit for the desired purpose. In the event of any problem, these records are useful to determine investigation pathways.

11.169 Conditions likely to promote microbial contamination include high moisture levels in air, particularly when associated with high air temperature. Stagnant air, possibly through poor ventilation, can contribute to fungal contamination whilst excessive air turbulence can increase airborne particulate levels and contribute to the dispersal of micro-organisms.

11.170 The maintenance of the environment is important to ensure that areas are intact, functioning properly and in a state such that they can be cleaned properly.

11.171 Water testing in a variety of situations (e.g. endoscope washer-disinfectors and steam for autoclaves) may require chemical and endotoxin testing as well as tests for conductivity and hardness.

11.172 Visual inspection must be part of physical monitoring to ensure for instance that filters are fitted correctly, that surfaces are smooth, impervious free of cracks and joins, and there is no accumulation of dust which may harbour fungi and bacteria.

Microbial monitoring

11.173 In terms of quality assurance, microbial sampling of the air, water and surfaces of the healthcare facility has an important role to play in helping combat the spread of infection within the built healthcare environment. NHS Healthcare Bodies should have a formal protocol for the monitoring of the built healthcare environment with regard to the control of infection. Some sampling may have to be performed in response to an investigation of an outbreak of infection. Results obtained should be interpreted using scientifically established baseline values for comparison e.g. Health and Safety Executive guidelines. On completion of analysis, actions to be implemented should be based on the results obtained.

11.174 The microbial monitoring protocols should be developed by the Infection Control Team, with input from other disciplines and bodies as appropriate. Areas where the built environment is suspected of contributing to the spread of infection, or where construction or refurbishment work is proposed should be referred to the Infection Control Team for consideration of monitoring and advice as appropriate.

11.175 Helpful advice is available from the United States in the CDC publication 'Guidelines for Environmental Infection Control in Health-Care facilities'. This document states that biological monitoring of the healthcare facility should occur in the following four situations (CDC; 2003):

- to support the investigation of disease or infection where environmental reservoirs or fomites have been implicated epidemiologically in the transmission of the disease or infection;
- for research purposes to provide information on the spread of infection within the built healthcare environment;
- to monitor a potentially hazardous situation;
- for quality assurance purposes as part of a quality control programme or to evaluate a change in prevention and control of infection.

11.176 Microbiological and other methods of sampling have an important role to play in training and education of healthcare staff.

Methods of microbial sampling

11.177 There are several types of microbial sampling methods. Conventional culture methods of microbial diagnosis are generally restricted by the amount of time it takes for qualification or quantification to occur. Culture techniques take a minimum of 18 hours to carry out and in some instances can take as long as 6 weeks.

11.178 There are a variety of methods and media available but many are poorly assessed and validated. In many circumstances there are no standards or set protocols for testing. Contact plates, swabs, enrichment versus selective media and sensitivity of the method needs to be assessed in order to allow

interpretation. It is important to know why the sampling is being carried out and what will need to happen if abnormal results are found. Environmental sampling can place a heavy burden on clinical laboratories which may not be set up, funded or accredited for non-clinical sampling.

11.179 Non-culture techniques do not require pathogen multiplication and can be a more rapid method of detection. These methods are being utilised with increasing frequency, including techniques such as:

- antigen detection techniques e.g. Elisa;
- toxin detection techniques e.g. endotoxin assay;
- ATP(Adenosine Tri-phosphate) detection techniques e.g. bioluminescence, used in the food industry as a rapid hygiene test for surfaces;
- residue protein detection tests (ninhydrin tests);
- soil tests;
- cleaning efficacy tests;
- molecular techniques.

11.180 Special consideration should be given to specialised areas such as control of Legionella. There is often specific guidance on such areas as the:

- Scottish Health Technical Memorandum (SHTM) 2040: 'The control of Legionellae in healthcare premises - a code of practice';
- Health and Safety Executive (HSE) guidance note L8 'Legionnaires Disease: The control of legionella bacteria in water systems. Approved code of practice and guidance'.

Decant facilities

11.181 Ideally, decant facilities should be readily available where, for example, construction/refurbishment works are being carried out. Where practical, consideration should be given to vacating areas and screening of clinical areas. If decant facilities are not available then additional cleaning and regular inspection will need to be put in place along with the use of ventilation or pressure differentials to control the work area and avoid cross contamination.

Replacement of internal surfaces

11.182 Regular inspections of surfaces are important to ensure that smooth, easy to clean surfaces are maintained. Damaged surfaces can harbour dust and contamination and soft difficult to clean finishes should be avoided.

Redecoration

11.183 Where practical, whole areas should be decorated at the same time. If not practical, consider smaller areas of work that are screened off from the rest of

the area. Finishes which are difficult to clean should be replaced with suitable alternatives, smooth, easy to clean surfaces.

12. Demolition

12.1 Work of this type will require a building warrant and a Decommissioning Team should be established. The Decommissioning Team needs to include a Planning Supervisor and consideration should be given to the likely spread of dust/dirt which the works will cause. Issues such as limitation of airborne fungal contamination need to be considered.

Decontamination of buildings and equipment

12.2 Buildings should be thoroughly cleaned after all furniture etc has been removed. There are some airborne decontamination methods which should be considered to minimise the risk prior to demolition. Equipment should be decontaminated prior to reuse elsewhere or final disposal.

Effect upon adjacent healthcare premises

12.3 There are health and safety issues which the Decommissioning Team will have to consider with the advice of the Planning Supervisor. Additional cleaning may be required due to the additional dust likely to be caused. Ventilation filters in areas likely to be subject to a high airborne dust load should be checked and changed if necessary, prior to demolition works starting. An overloaded filter can collapse and cause contamination. Filters should also be checked and changed if necessary once work is complete.

Planning for demolition works

12.4 Prevailing wind direction and the distance of the demolition works from occupied areas are key considerations when planning demolition works.

12.5 The demolition Project Plan should contain details of measures to be taken to minimise contamination of other areas. The person responsible for each control measure should also be named.

12.6 On completion of the work, the success or otherwise of the control outcomes should be formally assessed and the lessons learned disseminated widely, including outwith the organisation, for the benefit of colleagues involved in similar projects.

13. Decontamination prior to disposal of site

Decontamination of building and site

13.1 Any site to be disposed of will need to be clean and free of infection risk. It may be necessary to use a decontamination system such as fumigation. If such a procedure is carried out, records of site decontamination need to be kept and made available on request. Advice on disposal policies should be gained from Estates staff. Ash and clinker may also have been buried on the site and there may have been fuel leaks etc. These need to be identified to prospective purchasers.

Decontamination of land

13.2 There have been instances of hospital sites with dangerous materials such as clinical waste and asbestos disposed of within the hospital site. Decontamination of the site intending to be disposed of is the responsibility of the healthcare body. Contaminated land may need to be disposed of as special waste and can be extremely expensive as the soil removed must also be classified as special waste.

13.3 Current legislation constrains producers of waste to manage and dispose of it by means consistent with the hazard posed by the waste, through facilities approved for treatment of the particular category of waste e.g.

- ash and clinker may have been buried on site;
- fuel stored may give rise to fuel leaks;
- old sewers if not properly closed off can back flow into remaining premises and cause contamination with effluent.

13.4 Burying or long-term storage of waste on a healthcare site is likely to constitute an offence. Issues need to be identified to prospective purchasers.

14. Appendices

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Appendix 1: Equipment groups

Equipment supplied for new building schemes can be one of four categories:

Group 1

Group 1 items are specified at the design stage and are supplied and fixed under the terms of a building/engineering contract and funded within the works cost. These are generally large items of plant/equipment which are permanently wired/installed, i.e.

1. Specialised equipment items best suited to central purchasing arrangements.
2. Excluded from this Group will be items subject to late selection due to considerations of for example, radio diagnostic equipment. Taps and basins also fall into Group 1 equipment.

Group 2

Items which have implications in respect of space/construction services and are installed under the terms of building engineering contracts, but are purchased by the Client under a separate equipment budget e.g.:

- paper towel dispensers;
- soap/scrub dispensers;
- shelving;
- washer/disinfectors;
- washing machines.

Group 3

Items which have implications in respect of space and/or construction/engineering services and are purchased and delivered/installed directly by the Client e.g.:

- small refrigerators;
- furniture;
- ventilators;
- monitors;
- trolleys.

Group 4

Items which may have storage implications but otherwise have no impact on space or engineering services e.g. medical devices.

Appendix 2: Glossary

Airborne Infection: A mechanism or transmission of an infectious agent by particles, dust or droplet nuclei suspended in the air (Last, 1995).

Aspergillosis: A fungal infection caused by *Aspergillus spp*., commonly found in soil, decaying vegetable matter, damp cellars, building materials and ventilation systems. The most common mode of transmission is by the airborne route, for example dispersal of contaminated aerosol. In fact, airborne *aspergillosis* is a risk to patients with highly compromised immunity.

Contact transmission has been reported, for example a recent cluster of cases in Manchester suggested a contaminated stockinette was the source of infection. The density of *Aspergillus* spp. spores in hospital air is increased considerably during construction, and there is evidence that healthcare associated aspergillosis is caused by contamination of ward air from outside. Hospital ventilation systems can draw in contaminated outside air because of either malfunction or inadequate mechanical ventilation and air filtration (Manuel and Kibbler, 1998; Cornet et al, 1999; Mahieu et al, 2000; Richardson et al, 2000; Thio et al, 2000).

Cleaning: The process of physically removing contamination including soil, dust, large numbers of micro-organisms and the organic matter that protects them.

Cohort Nursing: Placing patients infected with the same micro-organism (but with no other infection) in a discrete clinical area where they are cared for by staff who are restricted to these patients.

Communicable disease: An illness due to a specific infectious agent or its toxic products that arises through transmission of that agent or its products from an infected person, animal, or reservoir to a susceptible host, either directly or indirectly through an intermediate plant or animal host, vector or the inanimate environment.

Contact: Association with an infected person or animal or a contaminated environment such that there is an opportunity to acquire the infection.

Contamination: The presence of an infectious agent on a body surface; also on or in clothes, bedding, toys, surgical instruments or dressings, or other inanimate articles or substances including water and food. Contamination does not imply a carrier state.

Cross-infection: An infection either due to a microbe that came from another patient, member of staff or visitor in a healthcare establishment or due to a microbe that originated in the inanimate environment of the patient.

Decontamination: The combination of processes which include cleaning, disinfection and sterilization used to render a reusable medical device safe for reuse on patients and for handling by staff.

Dead-legs: In a water supply and distribution system, pipes that are capped off or rarely used, or regions of pipework which are not scavenged by flow.

Disinfection: The reduction of the number of micro-organisms to a safe or relatively safe, level but not usually the destruction of pores.

Fomites: Articles that convey infection to others because they have been contaminated by pathogenic organisms. Examples include hospital equipment, instruments, kidney dishes, hospital bed tables.

Fungi: Unicellular, multicellular or syncytial spore-forming organisms that feed on organic matter; includes yeasts and moulds (Baril, 2000). The most common fungal infections are caused by *Candida* spp. (see, for example, O'Connell and Humphreys, 2000).

Healthcare associated infections: Infections that a patient acquires during a visit to, or that is related to a stay in a healthcare facility.

Heat labile: That which is likely to be damaged or destroyed by the normal heat disinfection process.

Iatrogenic infection: Infection that arises as an unwanted consequence of a medical intervention.

Immunocompromised patient: A patient whose immune response is deficient because of an impaired immune system.

Indirect contact: A mode of transmission of infection involving fomites or vectors. Vectors may be mechanical or biological.

Non-touch (taps): Includes foot or knee-operated, or infrared sensor taps.

Pathogen: A bacterium, virus, or other micro-organism that can cause disease.

Prion: An infectious protein to which several so-called slow virus diseases (for example Creutzfeldt-Jakob Disease, scrapie and bovine spongiform encephalopathy) are attributed. The word was coined in 1982 by S. Prusiner, from *pro*teinaceous *in*fectious particles, reversing the order of the vowels.

Reservoir (of infection): Any person, animal, plant, soil or substance, or a combination of these, in which an infections agent normally lives and multiplies, on which it depends primarily for survival, and where it reproduces itself in such a manner that it can be transmitted to a susceptible host: the natural habitat of the infectious agent (Last, 1995; Dancer, 1999).

Single room / En-suite single room / Isolation room/Bay: For the purposes of this document, the following terminology is used:

1) **Single room:** This is a room with space for one patient and usually contains as a minimum: a bed; locker/wardrobe and clinical hand-wash basin, plus a small cupboard with worktop.

2) **En-suite single room:** As above but with any combination of en-suite facility i.e. shower, shower and toilet, bath and toilet or just toilet etc.

3) **Isolation room:** As in 1 and 2 but with either negative pressure ventilation for infectious patients (source isolation) or positive pressure for immunocompromised patients (protective isolation). May or may not have a lobby or en-suite facility.

4) **Bay:** Any room that contains more than one bed (i.e. two-bedded bay; three-bedded bay; four-bedded bay; six-bedded bay, etc) which may or may not have en-suite facilities.

Spore: Some species of bacteria, particularly those of the genera Bacillus and Clostridium, which are significant cause of infection in humans, develop highly resistant structures called spores when they are exposed to adverse conditions, such as a lack of nutrients or water. Spores are resistant to disinfectants and to high or low temperatures. They may remain viable for many years but when the environment conditions improve the spores germinate and the bacterial cell inside starts to multiply again.

Sterilisation: The process of removing or destruction of micro-organisms including spores.

Thermostatic mixing valves: Valves that mix the hot and cold water of the system to provide water at a predetermined temperature.

Transmissible Spongiform Encephalopathy (TSE): Name for a group of fatal degenerative brain diseases that causes sponge-like abnormalities in brain cells. TSE diseases are associated with accumulation of abnormal prion protein in the brain.

Transmission: Any mechanism by which an infectious agent is spread from a source or reservoir to a person. Modes of transmission of infection include direct transmission involving direct transfer of micro-organisms to the skin or mucous membranes by direct contact; indirect transmission involves an intermediate stage between the source of infection and the individual, for example infected food, water or vector-borne transmission by insects; airborne transmission involving inhaling aerosols containing micro-organisms, for example legionnaires' disease of tuberculosis (Last, 1995; Donaldson and Donaldson, 2000).

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SCOTTISH CAPITAL INVESTMENT MANUAL

BUSINESS CASE GUIDE

DRAFT

TABLE OF CONTENTS

SCIM BUSINESS CASE GUIDE

SECTION 1

INTRODUCTION & SUMMARY

1 INTRODUCTION & SUMMARY

PURPOSE

1.1 The Scottish Capital Investment Manual (SCIM) has been revised to update the practices and processes associated with the development and approval of capital projects within NHSScotland (NHSS). These changes not only result from changes in the structure and organisation of NHSS but from the development of improved approaches and techniques which support the development of capital schemes across NHSS.

1.2 In developing the revised SCIM recognition has been made of the guidance that currently exists on a Scottish, UK and international basis with a view to drawing together best practice that can be applied within an NHSScotland context. To that end the SCIM does not set out to rewrite such guidance but to act as a conduit which brings together appropriate guidance in a form that supports identified stages in the development of capital schemes.

APPLICATION

1.3 The guidance included within the SCIM applies to all NHSScotland Bodies with effect from 1 November 2004.

TRANSITIONAL ARRANGEMENTS FOR PROJECTS IN DEVELOPMENT AT NOVEMBER 2004

Projects for which an outline business case, standard business case or full business case submission has been submitted for consideration by the CIG at meetings scheduled for November and December 2004 those business case submissions will be made using the existing SCIM and supplementary guidance.

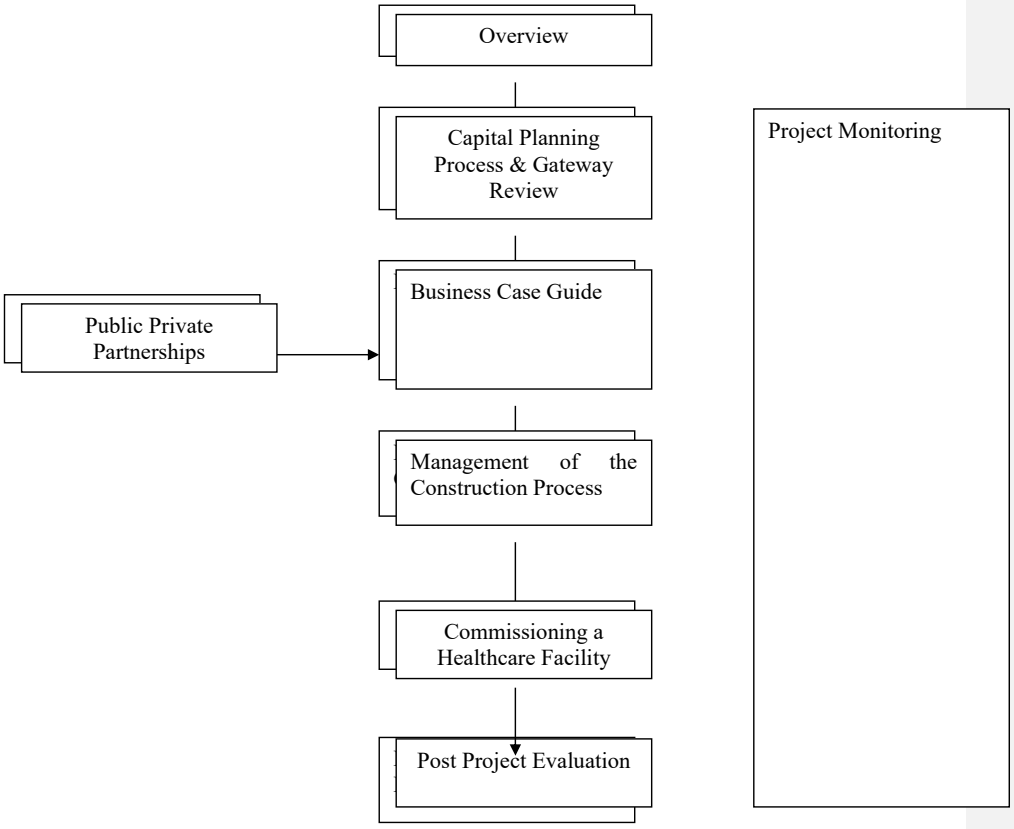
For Initial Agreements and Standard Business Cases due for submission at the November and December 2004 meetings of CIG, NHSScotland bodies must supply a completed [Risk Potential Assessment] with the Initial Agreement/ Standard Business Case.

Projects for which a case is scheduled for submission at the January 2005 CIG meeting or beyond must follow the revised SCIM guidance.

STRUCTURE

The SCIM has been structured to follow the capital investment process from inception to post project completion and evaluation. In considering the structure links have been established between other guidance within the public sector where appropriate. The basic structure of the SCIM covers:

SCOTTISH CAPITAL INVESTMENT MANUAL STRUCTURE



[NOTE: Format of above diagram to have hyper links to relevant sections

SOURCES OF ADVICE

Any enquiries on the content or application of this guidance should be addressed in the first instance to the Private Finance and Capital Unit

SCIM UPDATE AND DEVELOPMENT

The SCIM has been developed as a web based resource to facilitate the updating of current guidance and the introduction of new guidance within a recognised framework. It is intended to establish a Group involving representatives from the Department and NHSScotland to take forward areas for development and revision within the SCIM [link to Group membership and remit]

FEEDBACK

The SCIM website includes a forum [insert URL link] at which comments can be made. In addition comments on the content and application of the SCIM can be directed to the Private Finance and Capital Unit. [insert e mail address].

BIBLIOGRAPHY

LINKS

SCIM BUSINESS CASE GUIDE

SECTION 2

APPROVALS PROCESS AND CAPITAL INVESTMENT GROUP

APPROVAL PROCESSES & TIMETABLING

At the present time all Initial Agreements (IA), Standard Business cases (SBC) and Outline Business Cases (OBC) for projects other than IM&T projects with a capital value in excess of £1.5m must receive approval from the SEHD before continuing.

When the SEHD is satisfied with the quality of business cases and an agreed Property Strategy is in place, it will delegate full responsibility for these projects to NHS Boards for projects with a capital value up to £5m. NHS Bodies may determine for themselves whether or not to consider these projects for PFI but ought to be able to justify their decisions, particularly in the context of their duty to achieve value for money. The Approval limits are currently [link to separate table showing limits]

~~Joint Projects~~

The business case and approval process to be followed is determined by assessing the capital value of the scheme proposed. ~~Where schemes are being procured with other public authorities the NHSScotland contribution (in capital terms) will determine the approvals route chosen.~~

ISSUE: WHAT ABOUT SMALL SCHEMES- DEMINIMUS FOR SBC!!!!!!

~~Proposed Revenue Solutions~~

~~The process of identifying the appropriate procurement route (public capital, PPP, third party developer) will not be clear at the outset of a project. Where there is a proposal for a capital investment, regardless of the funding route, the business case process should be followed. For third party schemes that are GP led, NHSScotland bodies should require the equivalent of a SBC from GP's to justify future funding for such property developments.~~

DECISION TREE TO DETERMINE ROUTE

All procurements in the NHS, which would involve capital expenditure, should normally consider PFI. Where an NHS Board considers that a project has little chance of attracting private finance and that the interests of the NHS would not be served by testing for PFI, for example the refurbishment of an existing property, the NHS Board should fully explain this in the OBC (or SBC if applicable) on submission to the Capital Investment Group (CIG).

The role of the CIG is explained more fully in Section 2. Appendix 2 contains a suggested list of factors that should be considered when determining whether the scheme is suitable for PPP/PFI procurement. The CIG will determine whether or not the project should be exempt from the

~~8.~~

requirement to consider PFI. Each project will be considered on its own merits and will not necessarily set a precedent for later schemes.

Joint Projects & the Approvals Route

For projects involving more than one public sector partner, the decision route is determined by the NHSScotland contribution NOT the total value of a scheme. The requirements of SCIM require to be followed in respect of an infrastructure investment regardless of whether the outcome is a capital or revenue solution.

For Primary Care Third Party Developments

Until now only those third party developer schemes led by NHS Boards have followed the SCIM as regards the approval of business cases. This position has been reviewed at length and consistency is sought over the commitment of revenue resources (through the GMS framework) to support infrastructure investment led by independent contractors (principally GP's).

With the introduction of the SCIM NHS Boards will require all third oparty developer schemes to be supported by a business case identifying the proposed solution that provides best value for money. For NHS Board led schemes, the normal business case rules apply (based on the level of capital expenditure). For all other schemes, the NHS Board will require the completion of a Standard Business Case. This SBC will be considered by the NHS Board. Where the level of capital expenditure is in excess of the delegated limit, CIG approval will be required. [S TITHER TO COMMENT ON THIS SECTION]

{FOR PFI SCHEMES A SECTION IS REQUIRED ON HOW THE APPROVALS PROCESS FOR LPFS & NHS WORKS]

The Capital Investment Group

Introduction

The Scottish Executive Capital Investment Group (CIG) oversees the approval process for business cases across NHS Board areas where the value of the capital project is greater than the delegated limit. By approving the business cases submitted to it, the CIG gives health bodies the assurance of Departmental support for the strategic justification for progressing capital schemes whilst sending a clear indication to the private sector of the projects which are supported by SEHD. The CIG also acts as a forum for the development, promotion and distribution of best practice and guidance within capital planning and development whilst providing the Department with an overview of the strategic direction of the NHS.

Delegated limits

If the value of the project is greater than £1.5m for non-IM & T projects and £100k for IM&T, NHS bodies have to submit business cases to the CIG for approval before they can proceed. The CIG will increase this limit to £5m for non-IM&T and £1m for IM&T projects in the future and the revised limits for NHS Boards are attached at Annex A. The current limits for Special Health Boards will remain unchanged and are also outlined in Annex A. The CIG will advise NHS Boards when the revisions come into effect.

Within the SEHD the Chair of CIG has delegated authority to approve projects with a capital cost of up to £5m. For projects between £5m and £10m the CIG will, following the successful consideration of a business case, make a recommendation for approval to Director of Finance and Performance Manasgement has delegated authority to approve. In the case of schemes with a capital cost in excess of £10m the CIG will make a recommendation to the Head of Department.

Membership of the Capital Investment Group

The Head of the Property and Capital Planning Division, and in his absence the Head of the Private Finance and Capital Unit, chairs the meetings of the CIG. The chair is responsible for providing the secretary.

Membership of the CIG is comprised of representatives from the following SEHD areas-

- Performance Management
- Analytical Services (Economists)
- Private Finance and Capital Unit
- Primary Care Division
- Financial Performance Management and Accounting
- Information Management and Technology
- Chief Medical Officer
- Joint Futures Unit

CIG meeting dates

The CIG meets every 6 weeks to review the business cases which are submitted for approval by the Health bodies. The dates of the CIG meetings are placed on the PFCU website at http://www.show.scot.nhs.uk/pfcu

Submission dates for business cases

The required submission dates are available on the PFCU website(http://www.show.scot.nhs.uk/pfcu) These are the dates by which the Health Boards should submit their business cases (including resubmitted business cases) to the Department if they wish them to be considered at the subsequent CIG meeting. As a general rule, this date will be 4 weeks in advance of the CIG meeting and allows the documents to be circulated to, and reviewed by, the CIG members and further clarification sought from the Health Board if required before submission to the meeting.

Business cases that are not received in accordance with the timetable cannot be guaranteed consideration at the next meeting unless agreed in advance with the Chair of CIG. The Health Board should however be in contact well in advance of the meeting with either the PFCU or Finance Managers so that the business case is expected.

Early Engagement with CIG

Health Boards should note that the CIG encourages early engagement with the Department in the preparation of business cases and CIG members are generally content to review drafts/ meet with Health Boards prior to formal submission of business cases to CIG. Health Boards should liaise with their Finance Manager to facilitate this process.

Responsibilities of the PFCU

- To place the dates of the CIG meetings, and dates for the submission of business cases on the PFCU website
- To acknowledge receipt of a business case the same day it is received
- To circulate the agenda, business cases and any relevant papers in advance of the CIG meeting
- To record the minutes and decisions of the CIG meetings
- To circulate the minutes and decisions of the CIG meetings to SEHD Management and Health and Community Care Ministers
- To maintain a record of the progress of endorsed projects
- To maintain a record of the progress of conditions attached to CIG decisions
- To submit the public version of the approved business case to the Scottish Parliamentary library (SPICe) on receipt to PFCU
- To monitor receipt of Post Project Evaluation reports
- To maintain a record of issues raised, lessons learned and actions taken during the CIG process

Responsibilities of the Finance Manager

The Finance Manager has a co-ordinating role for the projects in his/her area and as well as being a member of the CIG, will liase with the NHS Board to clarify any issues that are raised prior to or at the CIG meeting. The appropriate Finance Manager has specific responsibility for the following-

- Inform the submitting body within 2 weeks of receiving the business case whether a meeting with CIG members is required, and if so, suggest possible dates for a meeting.
- Send copies of all correspondence exchanged with the health body to the CIG members and secretariat, and invite CIG members to attend review meetings with the submitting body
- Send at least an outline agenda, and whenever possible, a detailed set of questions to the Project Manager at least 2 working days in advance of this meeting.
- Endeavour to address all the questions raised in connection with the case at the review meeting, and to indicate at the end of the meeting whether any further information or evidence is required from the submitting body
- Submit review and evaluation summaries to the CIG secretary at least 5 working days in advance of a CIG meeting
- Issue standard approval letters to respective Health bodies informing them of the CIG decision and whether there are any conditions attached to the endorsement

Responsibilities of the CIG

- To declare any conflict of interest that may arise in the course of a review as soon as it is identified
- To conduct and complete all reviews in a professional and efficient manner
- To conduct and complete all reviews within the timetable established
- To ensure attendance at CIG meetings and where this is not possible, to provide a deputy with sufficient authority to approve or reject business cases
- To ensure all business cases receive a consistent degree of scrutiny in accordance with the appended pro-forma and with best practice
- To review progress and Post-Project Evaluation reports and provide an overview report on projects, incorporating and disseminating lessons learned.

Responsibilities of NHSScotland Bodies

NHSSCotland Bodies identify and develop projects, ideally working closely with the SEHD to evaluate the project and procurement options. This will include preparing where appropriate an Initial Agreement (IA), Outline Business Case (OBC), Standard Business Case (SBC) and Full Business Case (FBC) or Full Business Case Addendum (FBC(A)) for the project. NHSScotland bodies should discuss the timing of the submission of the business cases to CIG with their Finance Manager and/or the Head of the Private Finance and Capital Unit.

The NHSScotland Bodies are not able to continue the procurement process until SEHD approval is received.

Procedures by the Department on receipt of business cases

All the business cases are circulated to the members of CIG to consider not only the content of the business case but also the deliverability of the project and to examine the extent to which the project matches the SEHD priorities and the Local Health Plan and associated Property Strategy. Each CIG member will focus on their specialist specific area of the business case, for example financial or clinical aspects or whether it is suitable for PPP, and submit their comments to the Finance Manager in advance of the meeting. The CIG member can however comment on other aspects of the business case if he/she considers it appropriate. The Finance Manager will collate the comments, seeking further clarification from the NHSScotland Body if necessary, before the CIG meet to take a collective decision about the project. The CIG members, acting as a group, decide whether or not to approve the project, and if endorsed, make the approriate recommendation to the Director of Finance and Performance Management and Head of Department, or seek the appropriate clarification from the NHSScotland Body (ies) on issues to be resolved prior to a recommendation for approval.

The CIG will not approve projects on a conditional basis. The approval of a business case will be formally notified in writing to the appropriate NHSSCotland Body. The letter will be issued by the appropriate official within the Department based on the capital cost of the proposed scheme.

Health Boards should note that there should be no notification to the media until formal written approval has been received from the Department.

Post CIG meeting

After the meeting, the Finance Managers notify the submitting body of the outcome of the CIG meeting and whether there are any conditions attached to an endorsement. Within 5 working days of the meeting the CIG secretary circulates the minutes of the meeting and notifies the Departmental Ministers and Departmental Board of the decisions and any required approvals.

PUBLICATION OF PPP CONTRACTS AND CAPITAL BUSINESS CASES

This guidance incorporates and replaces earlier guidance contained in NHS MEL(1998)39, NHS MEL(1999)80 and HDL (2002)49.

On approval of the business case the submitting body must send a public version of the business case to the PFCU within 1 calendar month for placing in SPICe.

The Scottish Executive and NHSScotland Bodies in common with other public bodies, takes the view that private sector organisations contracting with them should have the right to exclude or delete text from documents if the publication of that text would put their interests at risk or allow competitors access to commercially sensitive information. There may also be circumstances where publication would prejudice the purchaser's legitimate commercial interests, in which case the harm risked by publication would have to be weighed against the public interest in disclosure. However, subject to these considerations, and subject to other legitimate reasons for withholding information as set out in the *Code of Practice on Openness in the NHS in Scotland*, the remainder of a contract should be made publicly available on request.

Arrangements for publication of documentation relating to capital projects

Irrespective of capital value, copies of contracts and the following key documents for both publicly funded projects and PPP/PFI deals should be made publicly available on request:

- the approved Standard Business Case (SBC) for projects below £5m;
- the approved Outline Business Case (OBC) for projects above £5m;
- the approved Full Business Case (FBC) for projects abobe £5m; and
- for PPP/PFI projects, the addendum to the FBC which is prepared after financial close. The addendum summarise any changes between FBC approval and financial close and include a summary of the commercial contract in plain English.

SBCs, OBCs, FBCs and contracts may be edited to remove text of a commercially sensitive nature. Any documents which contain references to suppliers must be cleared with the appropriate suppliers(s) before publication.
NHS bodies may charge for the cost of copying and, if applicable, postage when meeting requests for retention copies of documents from members of the public.

In addition to making documents publicly available, within one month of approval or financial close, a copy of the BC, OBC, FBC and addendum (if applicable) should be placed with the local authority; on view at the NHS Trust or Board for staff and patients and with the local Health Council. NHS Bodies must notify the Private Finance & Capital Unit, in writing, that these conditions have been complied with [link to template?]

For schemes in excess of £5m, the key documents (OBC, FBC and addendum (if applicable)) should in future also be displayed at the local main public library and SPICe, the Scottish Parliament library. To let the general public know that the business case is available for perusal, an advert should be placed in the local press detailing its placement in the local library and the date from which the document can be viewed. Separate adverts are required for OBCs and FBCs. The advert for the PPP/PFI FBC should state the expected date for financial close and the date when it is anticipated that the addendum will be added to the FBC in the local main library. No further advert need be placed for the FBC addendum.

For schemes in excess of £5m, a copy of the key documents must be sent to the Private Finance and Capital Unit, Scottish Executive Health Department, Basement Rear, St Andrew's House, Edinburgh, EH1 3DG which will arrange for the documents to be placed in the library of the Scottish Parliament (SPICe. Each document should clearly show a contact name, address and telephone number within the NHS Body for enquiries specific to the project. Each PPP/PFI document should also state that general enquiries on PPP/PFI should be addressed to the Head of the Private Finance & Capital Unit, SEHD.

POST OCCUPANCY AND POST PROJECT EVALUATIONS

Following approval of a Full Business Case/ Standard Business Case by CIG, Health Boards are reminded that the submission of Post Occupancy Evaluations and Post Project Evaluations is mandatory. The Private Finance and Capital Unit within the Department will be monitoring the submission of Post Occupancy Evaluations (POE) and Post Project Evaluations (PPE) in line with the timescales established in approved Full Business Cases.

All POEs and PPE must be sent to the Head of the PFCU. The Head of PFCU will write one month in advance of the anticipated submission of the POE/ PPE to seek confirmation of the expected date that the evaluations are to be received by the Department.

COMPLAINTS

Complaints about the conduct of the review should be directed to the Chair of the CIG, or in his absence, the Head of the Private Finance and Capital Unit. The Chair, or in his absence the Head of PFCU, will consider the relevant issues and notify the submitting body in writing within 5 working days of the proposed timetable and course of action for resolving the issue.

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SCIM BUSINESS CASE GUIDE

SECTION 3

GATEWAY REVIEW PROCESS

GATEWAY REVIEW PROCESS

INTRODUCTION

3.1 The SEHD is adopting the use of the Gateway Project Review Process to further support the delivery of the investment programme across the whole of the NHSScotland.

3.2 The Gateway Project Review Process was developed by the Office of Government Commerce (OGC) and introduced across Central Government as part of the Modernisation Agenda, to support the delivery of improved Public Services. The process has been operating since January 2001. It applies to construction/property projects, IT-enabled business change projects, projects that procure services and procurements utilising framework contracts. For further detailed explanation of the process please visit the OGC website at http://www.ogc.gov.uk/index.asp?id=377&

3.3 The Gateway Project Review Process helps the [DN TERMINOLOGY Senior Responsible Owner] to achieve their business aims by giving assurance that:

- People with appropriate skills and experience are deployed on the project.
- All the stakeholders covered by the project fully understand the project status and the issues involved.
- There is independent assurance that the project can progress to the next stage of development or implementation.
- There is visibility of realistic time and cost targets for projects.
- There is improvement of knowledge and skills amongst DH and NHS staff through participation in review teams.

Note: Senior Responsible Owner is a generic title. It means a senior individual who takes personal responsibility for the successful outcome of a programme or project. In construction projects this role is often referred to as Project Owner.

What is the Gateway Review Process ?

The Gateway Project Review Process looks at the readiness of a project or programme to progress to the next phase at 6 key stages in the life of the project. The 6 stages, or Gates, are:-

- Gate 0 - Strategic Assessment
- Gate 1 - Business Justification
- Gate 2 - Procurement Strategy
- Gate 3 - Investment Decision
- Gate 4 - Readiness For Service
- Gate 5 - Benefits Evaluation

The Gateway Project Review Process comprises a series of short, focussed independent peer reviews at key stages of a programme or project. The reviews are undertaken in partnership with

the project team and all stakeholders. They are designed to highlight risks and issues, which if not addressed, would threaten the successful delivery of the programme or project.

The length of each review depends upon the scope and risk of the project; and usually last between three to five days including the preparatory planning day.

The reviews are not audits and are not a replacement for the formal approval of business cases by SEHD. Gateway is being put in place to ensure that the processes underpinning the development of projects are robust and that at critical stages, an independent assessment can be undertaken to inform [Senior Responsible Officers] of the readiness of the project to proceed to the next stage of development.

The timing and short duration of the reviews, coupled with the use of existing project documentation are designed to minimise demands on the project teams and ensure no, or minimal, delay to the project.

A confidential review report is delivered to the Senior Responsible Owner, usually on the last day of the review. It is for the Senior Responsible Owner to determine what actions from the review report will be acted upon. It is also for the Senior Responsible Owner to determine whether and to whom the report will be released.

Details of the Gateway process, frequently asked questions and Gateway documentation can be found on the OGC websitehttp://www.ogc.gov.uk/index.asp?id=377&

Gateway Project Review Programme in NHSScotland

The SEHD has determined that, to further support the delivery of the investment programme, the Gateway Project Review Process will be used across the SEHD, associated arms length bodies and the NHS. Initially it will be used to review high risk and volunteer medium risk projects and programmes.

Risk Potential Assessment

The risk levels are determined by the completion of the Risk Potential Assessment , which is an excel spreadsheet that calculates the risk of a project based upon the scoring given to certain questions asked. The RPA provides essential contact details together with a profile of the main potential areas of risk associated with the programme or project. A copy of the RPA can be found on the OGC Website at http://www.ogc.gov.uk/index.asp?id=1000840

The [PFCU?] has been charged to implement and manage the Gateway Project Review Process across NHSScotland. The PFCU are there to help you with any queries you may have and can be contacted through [email link]. If you are unsure about any aspect of the process, how it relates to your project, or you just want to know some more, please get in touch.

If you would like to speak to someone, as opposed to sending an e-mail, please contact the Head of PFCU on [redacted].

What you need to do for your project(s)

Project Directors/Managers for all current and planned investment schemes above the internal delegated limit (capital value or whole life costs according to type of project) of the recipient body, are required to complete and submit a Risk Potential Assessment (RPA).

This should be completed for submission with the Initial Agreement or Standard Business Case dependant on the capital value of the scheme. An electronic copy of the completed RPA should be submitted with your business case to [Glenda Roy/ Generic E mail address]. The RPA will be assessed as part of the review of the Initial Agreement and the consideration by CIG will include the extent to which the gateway process is to be followed. Where your Initial Agreement sets out a programme of discrete projects you should complete an RPA for each of these projects.

The approval letter from SEHD will specify whether Gateway will be applied to each project/ programme.

Where a Review is required, the PFCU will work with the Project Director/Manager to establish the timing of the review, along with the composition of the independent review team. The PFCU will provide Gateway Review supporting documentation. The review should not lead to the generation of any additional documents by the project team.

Gateway need you and you need Gateway

- The Gateway Project Review Programme relies upon a panel of experienced peer reviewers from a wide range of disciplines. These include but are not limited to physical and IT project management, procurement, strategic service planning, commissioning, etc. The commitment starts at 5 days per year.

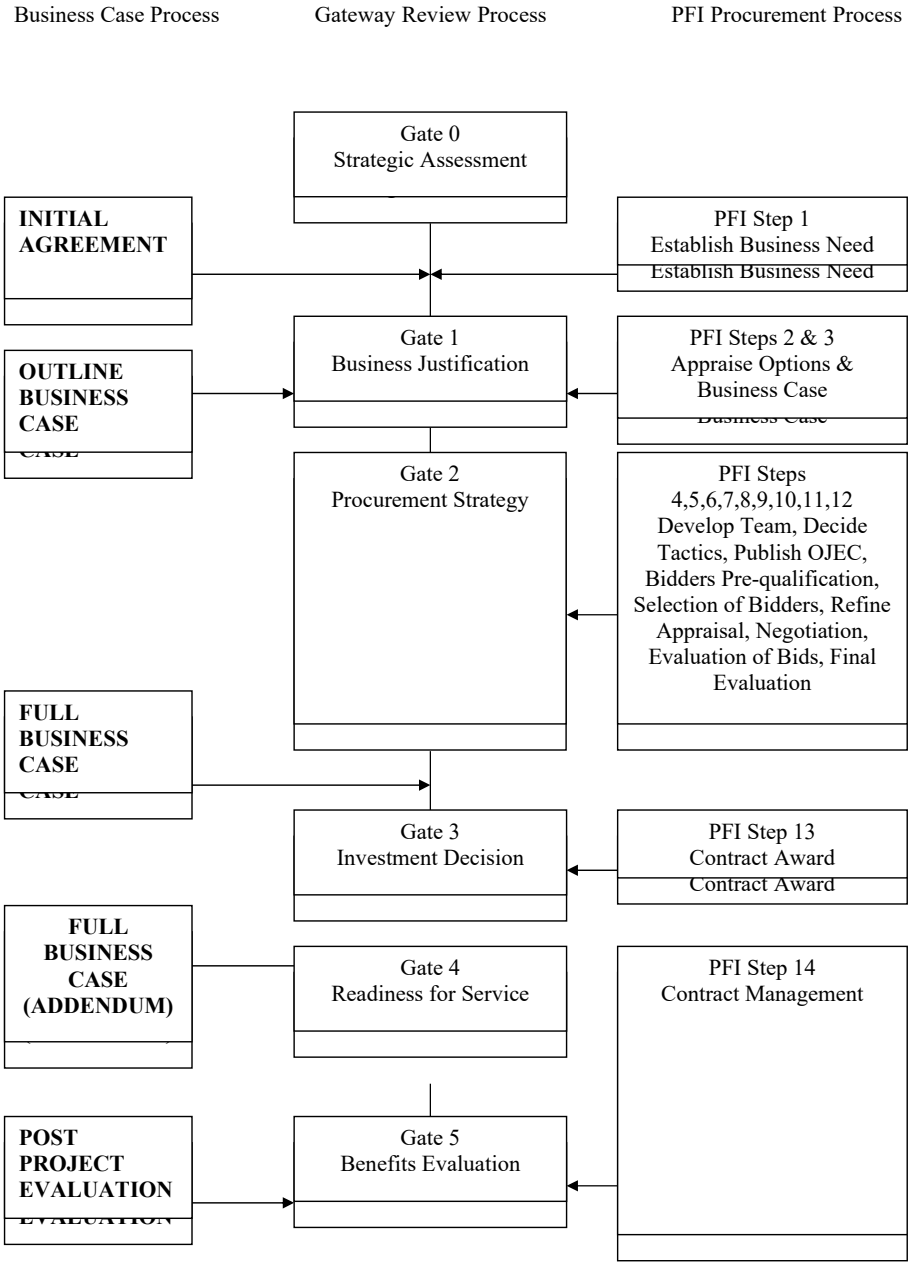
- Participation as a reviewer is a proven career development tool providing the opportunity to examine the methods of working of other project teams in a range of different settings.

- Please apply to become a Gateway Project Reviewer by submitting a nomination form obtainable from the OGC web site, or request one by return e-mail from together with a current, brief, Curriculum Vitae.

- Participation as a reviewer has the backing of the SEHD/NHSScotland Chief Executive demonstrated in [letter from T Jones re involvement & link to document].

- If you wish to volunteer, please email the Head of PFCU at [redacted]

MAPPING OF BUSINESS CASE/ GATEWAY AND PFI PROCESSES



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SCIM BUSINESS CASE GUIDE

SECTION 4

STANDARD BUSINESS CASE

STANDARD BUSINESS CASE

Introduction

The Standard Business Case (SBC) serves a number of purposes. It seeks to optimise the approvals process for mainstream projects of a capital value of up to £5m whilst at the same time providing a robust decision making tool to Boards and SEHD (initially) and to Boards alone following the granting of increased delegated limits.

The key here is a robust and defensible decision making tool that protects the interests of NHSScotland and Scottish Ministers, demonstrates the appropriateness of investment decisions together with derived benefits and the ability of organisations to deliver projects effectively.

The introduction of the revised capital allocation process and the extension of delegated limits has and will radically alter the role of CIG in relation to schemes covered by the SBC process. In the interim, the SBC is still a basis for decision by the Department for mainstream schemes between £1.5m and £5m and will continue to be the foundation for formal reporting within all Board types for the approval of capital schemes post increased delegation. With both the short and long term in mind, the SBC itself, and the evaluation of it, is based on robust principles.

Development of the SBC

A revised format template is attached at [Annex A] with the scoring sheet in Excel format in [Annex B].

LIST OF OPTIONS

In order to ensure value-for-money for the public purse, it is important that the NHS Body considers a range of possible solutions to the project objectives as part of the appraisal process. At the same time, the level of effort devoted to the appraisal should be proportionate to the scale of the project. As such, in general, the option appraisal for SBCs might be expected to be less detailed than that for larger scale projects. Nevertheless, the same principles apply as for all size of option appraisals and this guidance should be read in conjunction with both Green Book guidance and the guidance contained elsewhere in this business case guide.

In preparing the SBC, It is important that the NHS body deliberates the full range of options (including radical options) that might conceivably meet the objectives of the project. The list of options should always include a 'do minimum option', where the NHS body undertakes the minimum amount of action necessary. The purpose of including this option is to provide a benchmark or baseline option against which the vfm of higher-cost options can be assessed [footnote - The Treasury Green Book, p17-18, provides further useful guidance on establishing a range of options]. The SBC should list all options which were considered to be possible solutions capable of meeting requirements.

Consultation with stakeholders is important at this stage to inform the initial consideration of a list of options and to inform the appraisal of the relative costs and benefits of different options. The SBC should include an account of the extent and type of stakeholder involvement at the option appraisal stage.

Economic Appraisal

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A key part of the appraisal process is the economic appraisal. This allows a comparison of the value-for-money of different options based on the *quantifiable* costs and benefits of each option. Again, the level of detail contained in the appraisal should be commensurate with the scale of the project.

The economic appraisal should identify and where possible quantify the relevant costs and benefits associated with each option. The NHS Body should carry out this appraisal using the principles set out in Business Cases Stage 4-8 and in the appropriate appendices, which cover issues of valuing costs and benefits and discounting those values to a common basis. In following this guidance, it should be noted that the Standard Business Case is intended to be a short document setting out the business case for smaller projects and the level of detail in the economic appraisal should be adjusted accordingly.

The presentation of the results of the economic appraisal should take the form of a table summarising NPV scores for options and benefits scores/ranking.

In addition to presenting the results of the option appraisal, the SBC should include an account of the methodology used in the option appraisal. The SBC should also include a statement that the appraisal of a full range of options has been considered and evaluated following the guidance in SCIM, considering costs, benefits and risks.

Identifying the Preferred Option

The final choice of a preferred option rests with the managers of the NHS body. This decision is likely to be based on more than the results of the economic appraisal alone. In particular, the decision should take account of non-quantified costs and benefits associated with each option.

Non-quantified costs and benefits and other relevant factors that affect the choice of preferred option will include:

- The relative fit of each option with overall project objectives.
- Affordability issues.

The SBC should clearly set out the NHS body's preferred option. The SBC should also set out how the preferred option has been selected and should include a table stating the key assumptions underlying the option appraisal process (financial, demand, staffing, technology etc).

PREFERRED OPTION GENERAL

Once the preferred option has been identified, this option should be the subject of a more detailed analysis. The SBC should contain a brief narrative describing the preferred option.

There should also be an assessment of the funding requirement associated with the preferred option. This funding requirement would be expected to contain as a minimum:

- The capital and revenue costs of the proposed option with appropriate phasing;
- The sources and base of cost data presented;
- A statement that the project is affordable within the overall financial plan and that the Trust and Health Board in agreeing the SBC are agreeing to commit identified resources to the project. Reference should be made to specific meetings at which approval was given;

- A statement that options explored all opportunities for joint working with other agencies.

The potential for procuring the project with PPP/PFI should be fully explored. Where PFI/PPP is not to be pursued there should be a justification for this decision based on factors considered in "*HDL (2002) 87 Interim Capital Guidance Appendix B – Factors In Assessing PPP/PFI Potential".*
[does this last paragraph need to be extended?]

FUNDING REQUIREMENT

In drawing up the Standard Business Case (SBC) the health body must ensure that they have established the funding requirements for the project both in revenue and capital terms.

The initial analysis of the likely funding requirement and the affordability of the project(s) will therefore be an integral component of setting the strategic context within which the SBC will sit. The health body, taking into account the financial constraints they operate within, should clearly demonstrate that the investment can be absorbed within its current and future cost base. The likely funding requirements and associated costs of the project will therefore be included within the strategic financial planning process at the earliest stage [*link to website for the strategic planning*]. The funding requirements will also be detailed within health bodies Local Health Plan [*link to website for the LHP*] and supporting Property/IT Strategy.

The SBC will detail both the capital and the revenue costs of the project. If the project is to be revenue neutral then statements to that effect should be contained within the SBC. Budget managers and other associated stakeholders should be engaged and informed from the outset with regards to the project to allow then to input into the costing process. Engaging with such stakeholders will ensure the robustness of the financial information and allow for comprehensive modelling to take place.

In terms of the capital funding the health body will indicate whether the funding will be sourced through the traditional means of the Capital Resource Limit issued to the health body through the Health Department or through the PPP/PFI route. The health body will require therefore to ensure that the investment forms part of the overall strategic financial planning process, this will allow the investment to be adequately budgeted for.

The phasing of costs and funding requirements will prove to be an important issue, and this should be timetabled within the SBC. The timescales should detail if/when additional capital and revenue will be required. If savings are to be released to support the project, then details of such savings should be detailed along with the timing of their release.

Ultimately there is no value in investing in a scheme that cannot be demonstrated to be affordable, or for which funding is unlikely to be available.

Checkpoints:

1. Has the revenue and capital funding requirements been established?
2. Has the affordability of the project been verified by the health body, i.e. can the project costs be absorbed within the current and future cost base?
3. Has the project been specifically detailed within the separate strategic financial planning templates – therefore allowing the project to be adequately budgeted for?
4. Has the project been specifically detailed within the Local Health Plan/Property and I.T. strategy?

5. If the project is to be revenue neutral has a statement to that effect been included?
6. Have budget managers and associated stakeholders been engaged and involved from the outset?
7. Has the likely source of funding been identified?
8. If savings are to be released, have such savings been detailed along with the timing of their release?

SCIM BUSINESS CASE GUIDE

SECTION 5

INITIAL AGREEMENT

Introduction

The Initial Agreement (IA) is a brief document that makes the case for strategic change and sets out the proposal in the context of the NHS Board's strategy. The IA ensures that the project meets the objectives of the Local Health Plan and, is consistent with the Property/ IT Strategy. The context for any proposal(s) must be clearly demonstrated

When should an IA be Prepared?

An IA is mandatory for

- For NHS Board/ Special Health Boards and CSA projects (other than IM&T) with a capital cost of £5m (inclusive of VAT) or greater;
- For NHS Board & CSA IM&T projects with a project life cost over the first 4 years of the project (or the project life, if shorter) greater than £1m (inclusive of VAT);
- For Special Health Board IM&T projects with a project life cost greater than the current OJEC threshold for advertising (approximately £100k).

What does the IA do?

The IA provides a framework for decision making at a point in the process where the scope and rationale for the project is sufficiently developed without detailed and potentially abortive work having been commissioned/ undertaken.

Under this guidance there are two approaches to the preparation of an initial agreement which should be considered by those preparing them.

- Single Project IA
- Multi Project IA

The single project Initial Agreement is what would be regarded as a traditional approach used within NHSS. The second approach is new and seeks to both rationalise the capital approvals process whilst at the same time provide a clearer link between a programme of major strategic change with the individual projects that will support this programme.

The first supports a single project with the second, as a result of an agreed strategic decision, sets out a programme for change which is to be delivered through a number of business cases. In the case of a multi project IA, the NHS Board should clearly demonstrate the proposed timing of the various developments that will be brought forward and the dependencies that exist between projects.

An example of the second approach would flow from an Acute and Related services review where the overall strategy for change would first be approved by the NHS Board and then submitted for approval by the Minister for Health and Community Care. Following such an approval, the NHS Board would then submit an IA to the Capital Investment Group which would establish the projects that are to be taken forward and apporopriate timescales for their development.

Structure of the IA

The IA will be structured in accordance with the following checklist. A checklist is provided [link here to a prepared Word version of the template] which should be completed by the NHS Board and submitted to SEHD with the IA. This checklist should be signed off by the [DN Senior Responsible Officer] The section below sets out the key contents of the IA and provides guidance on each of these areas.

The key contents are:

1. Project Title
2. Strategic Context for Proposals
3. Critical Success Factors
4. Managing the Business Case
5. Identify Stakeholders
6. Consider initial options
7. Affordability/ Budget
8. Achievability
9. Consider Sourcing
10. Determine acceptable balance of cost, benefit, risk
11. Test Assumptions
12. Decision to Proceed or Not

ANNEXES

A. Risk Potential Assessment
B. Stakeholder Map
C. Dependencies
D. Completion Checklist

The title of the project

As it appears in the Board's Capital Plan and as it will appear in the reporting system.

Strategic Context

The overall strategic context of the case for change **must** be clearly demonstrated within the IA. Primarily this strategic perspective would ensure that the proposal(s) fits with national & local priorities. The IA should therefore demonstrate how the proposal/range of proposals will contribute to the achievement of strategic objectives as articulated in the Local Health Plan and supporting Property/IT Strategy. The proposal(s) must therefore link not only to the local strategic direction of the health body but must also correlate with the national agenda.

[INSERT SECTION COVERING REGIONAL PLANNING FRAMEWORK AND DEMONSTRATION OF REGIONAL CONSIDERATION]

The IA should therefore demonstrate the strategic fit of the proposal(s), including why change is needed. This will include the details on clinical need and the proposed outcomes which will result,

such as patient benefits. It will therefore be imperative that health bodies only move to draft an IA once it is clear that the projects fit within a clearly defined and agreed strategy.

The preparation of the IA provides a framework for decision making at a point in the process where the scope and rationale for the project is sufficiently developed but without detailed and potentially abortive work having been commissioned/undertaken.
Health bodies should note that the absence of a clear strategy to which the project(s) fit will result in the rejection of the proposal by CIG and delay taking the process forward to the Outline Business Case stage. The clear aim of this is to improve the decision making process locally and by SEHD.

Checkpoints:

1. Has the health body established its overall strategic objectives within which the project is to sit?
2. Has the health body detailed the as to why the project is required (strategic need for change) and how it fits with the health bodies overall strategic objectives?
3. Has the clinical need for the project been established and have the services to be affected been identified?
4. Have the outcomes from the project been detailed (i.e. benefits to patients)?
5. Has the overall scale of the project been established?
6. Has the health body identified a number of options to take the project forward?
7. Have the strategic objectives/clinical need and outcomes in which the project sits been linked to the Local Health Plan?
8. Have the strategic objectives/clinical need and outcomes in which the project sits been linked to the Property/IT strategy?
9. Is the I.A. for a discreet project (i.e. single and stand alone)?
10. Does the project form part of a series of link projects for which more than one directly related OBC/SBC may be submitted to the SEHD for assessment in due course?

- Clinical needs

- Proposed Outcomes – benefits to patient

Critical Success Factors

The IA must set out the critical success factors for the project/programme and establish the broad criteria against which the long list of options will be assessed for their suitability and against which the outcomes of the programme/ project can be assessed over time. These factors should be SMART and the dependencies between factors demonstrated. The proposed service benefits should be clearly stated whether strategic, operational or clinical

Managing the Business Case

The business case is the articulation of what the project/ programme is and how the delivery of benefits will be achieved. The business case is not a static document but evolves within an agreed framework as the project develops and evolves. The business case must be subject to review at each key decision stage {INPUT REQUIRED FROM PROJECT ORGANISATION GROUP]

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Identify Stakeholders

Key stakeholders should be identified in the IA together with coverage of the engagement to date and details of how stakeholder involvement/ input is to be managed as the programme/ project Reference should be made to [SEHD guidance on participation]. Guidance prepared by OGC is helpful in this regard [link to OGC Stakeholder guidance].

Consider Initial Options

The Initial Agreement should allow a decision to be made as to whether there are sufficient strategic grounds for undertaking further appraisal, and whether the proposed investment is consistent with the Trust's business plan. As such, there is no requirement at this stage for a detailed investigation or appraisal of options. Nevertheless, it is necessary to provide an indication of the range of options which might be included at the OBC stage. The purpose of this is to give a broad indication of the likely scale of investment which might be required and to provide the CIG with an early indication of the range of options that will be explored in more detail at OBC stage.

A short description of the range of options to be considered should be set out in the IA along with a broad estimate of the range within which the cost of the project is expected to lie.

In the process of defining a range of options, it is important that the NHS body deliberates the full range of options that might conceivably meet the objectives of the project. In particular, radical options should at least be *considered* at this stage. Although such options may not be formally included in the range of options set out in the IA, they can be useful in testing the parameters of feasible solutions and ensuring that no option is omitted which might later have been developed into a credible value-for-money solution.

The range of options should include a 'do minimum option', where the NHS body undertakes the minimum amount of action necessary. Such an option should be carried forward to OBC stage, even where it might be considered at IA stage to be a clearly inferior option. The purpose of including this option is to provide a benchmark or baseline option against which the vfm of higher-cost options can be assessed.

The Treasury Green Book [footnote "Green Book p17-18"] provides further useful guidance on establishing a range of options.

Affordability/ Budget

Ultimately there is no value in investing in a scheme that cannot be demonstrated to be affordable to the health body. The initial analysis of affordability of the project(s) will therefore be an integral component of setting the strategic context for the business case. The health body, taking into account the financial constraints they operate within, should clearly demonstrate that the investment can be absorbed within its current and future cost base. The associated costs and likely funding of the project will therefore be included within the strategic financial planning process at the earliest stage [*link to website for the strategic planning*]. The initial assumptions in relation to the capital and revenue costs and funding should also be included.

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The IA should contain broad indications on both the capital and the revenue costs of the project. If the project is to be revenue neutral then statements to that effect should be contained within the IA. Budget managers and other associated stakeholders should be engaged and informed from the outset in the project to allow then to input into the costing process. Engaging with such stakeholders will ensure the robustness of the financial information and allow for comprehensive modelling to take place.

The health body must also detail the likely source of funding for the project. There should be an indication of whether the funding will be sourced via traditional means through the Health Department and/ or whether the PPP/PFI route is to be explored in the OBC.

The phasing of costs and funding will prove to be an important issue. Timescales should be detailed of when additional capital and revenue will be required. If savings are to be released to support the project then details of such savings should be detailed along with the timing of their release.

Achievability

In order to ensure that the project is achievable the health body must ensure that from the outset the options that have been identified can actually meet the strategic need for change, and address the objectives of the project as a whole.

The project must be managed through defined and acceptable accountabilities, supported by clear and short reporting lines. This will be mirrored by the Health Body ensuring that there is a clear overall commitment to the project - with the need for change being embraced and supported by the whole organisation. Visible support will be vital and must be seen to be coming from the executive team, and not solely those directly involved in the projects development.

The health body must ensure that a whole systems approach has been taken to develop the project. Even at this early stage the risks should be assessed, and the health body should consider whether adequate capital and revenue resources will be available. The health body must assess whether they have the capabilities to deliver the project, or whether partners will have to be brought in to aid the projects development and progression. This will be a key issue in determining whether the project is viable or not.

The project itself should be developed in such a way that an integrated approach is taken – with the health body assessing whether the project will be delivered on budget, within time and to the correct quality. Critical success factors should be introduced at each stage of the project to judge how the project has developed and performed.

Finally the health body must be realistic in its approach to the development of the project. In doing so the project will be better placed to actually achieving the outcomes which were identified under the need for change.

4. Consider Sourcing

At the IA stage there is no presumption made regarding the funding or procurement routes to be followed. In considering the long list of options to be assessed

5. Determine Acceptable balance of cost, risk and benefits

- Complete Gateway Risk Potential Assesment to assess levels of risk and determine appropriate Gateway route

6. Test Assumptions

The assumptions made in developing the Initial Agreement should be tested to assess whether in principle, the proposed course(s) of action will indeed achieve what is proposed. Such analysis will also be informed by the Risk Potential Assessment which will identify key risks to the effective development and delivery of the project.

7. Decision to Proceed

The approval of an IA

The IA must be signed off by the NHS Board or Special Health Board Chief Executive. Prior to submission to SEHD the IA should have been approved by the NHS Board/ Special Health Board. In the case of Regional Services the IA should adequately demonstrate the NHS (and other) Bodies involved, the extent to which they have been consulted and involved in the decision making processes within the IA and the position of Regional Planning Groups with regard to the strategic changes proposed. The CIG will then consider the IA with a view to allowing the programme/ project to proceed to OBC.

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EVALUATION CHECKLIST FOR INITIAL AGREEMENT

	NHS BOARD ASSESSMENT	SEHD ASSESSMENT
1. Strategic Context **a) Has the health body established its overall strategic objectives within which the project is to sit?** **b) Has the health body detailed the as to why the project is required (strategic need for change) and how it fits with the health bodies overall strategic objectives?** **c) Has the clinical need for the project been established and have the services to be affected been identified? Have the outcomes from the project been detailed (i.e. benefits to patients)?** **d) Has the overall scale of the project been established?** **e) Has the health body identified a number of options to take the project forward?** **f) Have the strategic objectives/clinical need and outcomes in which the project sits been linked to the Local Health Plan?** **g) Have the strategic objectives/clinical need and outcomes in which the project sits been linked to the Property/IT strategy?** **h) Is the I.A. clearly established for a discreet project or a series of linked projects for which more than one directly related OBCs may be submitted to the SEHD for assessment?**		
2. Critical Success Factors **a) Have critical success factors been adequately identified within the IA e.g. are they SMART, consistent**		
3. Managing the Business Case **a) Is there adequate demonstration that there are programme/ project management arrangements in place.**		
4. Identify Stakeholders **a) Demonstration of stakeholder involvement and support for the proposals**		
Consider Initial Options **a) Full range of options adequately considered**		

Affordability/ Budget **Does the health body detail whether the project is affordable within its current and future cost base?** **Has the project been specifically detailed within the separate strategic financial planning templates?** **Have the key assumptions in relation to both revenue and capital on which the project has been based been detailed?** **If the project is to be revenue neutral has a statement to that effect been included?** **Have budget managers and associated stakeholders been engaged and involved from the outset?** **Has the likely source of funding been identified?** **Has the source of funding been phased?** **If savings are to be released, have such savings been detailed along with the timing of their release?**		
Achievability **Are the objectives/ targets set out achievable** **Are the timescales established for the development and delivery realistic**		
Consider Sourcing **What assumptions are made regarding sourcing and are they reasonable**		
Balance of Cost/ Risk Benefits **Is the RPA completed correctly** **Is the project high medium or low risk** **What is the recommendation regarding Gateway Review**		
Test Assumptions **Are assumptions adequately stated and tested for robustness**		
Decision to Proceed **Have appropriate NHS Body approvals been given** **Are all CIG members content to approve**		

WHAT NEXT

Following completion and approcval of the initial agreement the next stage is the preparation of an Outline business case (OBC) [link to OBC section]

OUTLINE BUSINESS CASE

PURPOSE

The OBC is a detailed document that identifies the preferred option and supports and justifies the case for investment. The emphasis is on what has to be done to meet the strategic objectives identified in the IA. A full list of options will be reduced to a short list of those which meet agreed criteria. An analysis of the costs, benefits and risks of the short listed options will be prepared. A preferred option will be determined based on the outcome of a benefits scoring analysis; a risk analysis, and a financial and economic appraisal. PPP/PFI should be explored.

MANDATORY FOR:

- For NHS Board projects (other than IM&T) with a capital cost of £5m (inclusive of VAT) or greater;
- For NHS Board IM&T projects with a project life cost over the first 4 years of the project (or the project life, if shorter) greater than £1m (inclusive of VAT);
- For Special Health Board projects (other than IM&T) with a capital cost of £0.5m (inclusive of VAT) or greater; and
- For Special Health Board IM&T projects with a project life cost greater than the current OJEU threshold for advertising (approximately £100k).

General Guidance & Formatting Issues

The guidance within this section of the SCIM covers the details the areas that require to be covered and the techniques that should be applied in undertaking option appraisal. As for general rules

- **the OBC should be clear and concise**
- **OBC's should make good use of annexes to provide necessary detail in support of the business case and anlysis supporting the option appraisal.**
- **The OBC should be submitted with a covering letter from the Chief Executive of the Sponsoring Organisation confirming details of the NHS Board approval.**
- **The process requirements set out in this section of SCIM are mandatory**

THE OUTLINE BUSINESS CASE PROCESS

Note: Click on relevant stage and go to appropriate section of guidance

Stage 1 Introduction	Title, Executive Summary, Background,
Stage 2 Establish Strategic Context	General, National, Regional, NHS Board, Divisional
Stage 3 Define Objectives and Benefit Criteria	
Stage 4 Generate Options	
Stage 5 Measure the Benefits	
Stage 6 Identify and Quantify Costs	
Stage 7 Assess Sensitivity to risk	
Stage 8 Identify Preferred Option	
Stage 9 Assess Suitability for PFI	
Stage 10 Operational Issues	
Stage 11 Project Planning Issues	
Stage 12 Presentation and Approval	

~~OUTLINE BUSINESS CASE: KEY STAGES FOR DEVELOPMENT~~

~~STAGE~~	~~AREAS TO COVER~~
Stage 1 Introduction	Title, Background,
Stage 2 Establish Strategic Context	
Stage 3 Define Objectives and Benefit Criteria	
Stage 4 Generate Options	
Stage 5 Measure the benefits	
Stage 6 Identify and quantify costs	
Stage 7 Assess sensitivity to risk	
Stage 8 Identify preferred option	
Stage 9 Assess Suitability for PFI	
Stage 10 Operational Issues	
Stage 11 Project Planning Arrangements	
Stage 12 Presentation and Approval of OBC	

OBC STAGE 1 INTRODUCTION

The OBC should contain the following information:

1. The title of the project

As it appears in the Board's Capital Plan and as it will appear in the reporting system. The title should identify the proposed action and nature of the analysis

2. Executive Summary

The executive summary is key to setting out the subject and main conclusions. The executive summary requires careful preparation as some of your audience may only read the executive summary or focus on particular areas of interest in the OBC. The executive summary is therefore critical to reach this element of your audience.

3. Background

The background section should include the following details:

The organisation

This section should include key facts on size, function and structure. Remember that the audience for your business case is wide ranging and their knowledge of your organisation varied.

Information to be included will be

- the current activities of the NHS Board and the range and quantity of health care services it provides;
- assessment of the Board's current financial position and cost structure;
- assessment of NHS Board resources (assets and manpower) and their current utilisation in service provision (including their functional suitability);
- assessment of the current service performance relative to the NHS Board's requirements (e.g. in the case of an acute hospital project patient activity for each of the main specialities and services,
- proportion of treatments conducted as day cases by speciality, length of stay for in-patients, turnover interval by speciality and other relevant performance indicators). Also cost per case data;

- overview of health strategy for the area, drawing on the Local Health Plan. Also, any relevant local and national reviews which have a bearing on where and how different types of services should be provided;
- assessment of any changes in the pattern of services needed to meet NHS Board(s) requirements and future demand (including the rationale for any changes to the current configuration of services or estate);

- description of the NHS Board's strategy for meeting its service requirements, including how the proposed development will meet those requirements and its impact on other NHS Boards served by the NHS Board;

- justification of the assessment of future services and functions required by reference to NHS Boards(s) requirements, projected catchment population, changes in medical technology, and other factors influencing the demand for services or the NHS Board's ability to meet demand.

The Project

You should clearly and concisely explain what the project is in terms of clinical need, the benefits to patients which would result, the implications of not meeting the need e.g. reduced service, under capacity, inappropriate facilities, failure to meet recognised standards; and a full explanation of the services required together with a description of the existing assets to be replaced, altered or refurbished to allow efficient service delivery. In addition tyou should provide a brief commentary on the development of the project to this point including timescales for development including prior approvals, statements regarding any changed assumptions from IA approval and organisational change since prior approval.

The introduction to the OBC must also contain a statement that any decision to approve the OBC is not in conflict with any outstanding ministerial consideration or public consultation.

OBC Stage 2 Establish Strategic Context

This section puts the proposed actions in a number of contexts. It is appropriate to look at this from 4 perspectives. These are:

- National
- Regional
- Board level
- Divisional

National

This section of the strategic context addresses the relationship of the project to stated national priorities and targets. Whilst not a surrogate for the benefits analysis section of theb OBC, the general relationship of the scheme to such priorities should be stated. Where there is an identifiable and/ or quantifiable impact on such targets this should be clearly stated. The option appraisal will subsequently examine the relative impacts of different options.

Regional

There should be a demonstration within this section of the OBC of how the regional planning network(s) have/ have not been involved within the development of the scheme. This is particularly applicable but not exclusive to specialist/ tertiary services. Reference should be made to discussions within the Regional Planning Network and any decisions taken regarding the development of the project.

Board Level

The health body must establish the strategic context within which the proposed investment is to be made. This will build upon the strategic context section contained within the Initial Agreement and should detail any changes in the key assumptions underlying the original strategic/business direction of the Health Body. In doing do the health body will ensure that the capital investment continues to be consistent with the objectives of the health body as a whole. In setting the strategic context in which the investment will take place, the health body should provide the following information:

A description of the health body and its catchment area and catchment population for its services;

A description of the Local Health Plan [*link to website for the LHP*] and the strategic direction and business objectives of the health body and how the project fits within these. With an overview of the health strategy for the area, drawing on the Local Health Plan. The impact of relevant local and national reviews which have a bearing on where and how different types of services should be provided should also be considered.

The current activities of the health body and the range and quantity of health care services it provides; and how the project will sit within the current and future service provision.

An assessment of the health bodies current financial position and cost structures and the acknowledgement that the project is included within the strategic financial plans [*link to website for the strategic planning*] produced by the health body.

The health body should set out an assessment of resources in terms of assets and manpower, and their current utilisation in service provision (including their functional suitability);

Assessment of the current service performance relative to the health bodies requirements (e.g. in the case of acute healthcare the project patient activity for each of the main specialities and services, proportion of treatments conducted as day cases by speciality, length of stay for in-patients, turnover interval by speciality and other relevant performance indicators). This should also cover cost per case data;

Assessment of any changes in the pattern of services needed to meet health bodies requirements and future demand (including the rationale for any changes to the current configuration of services or estate). The investment must therefore form part of the coherent local strategic service strategy and provides a configuration of services which are sustainable in the long term.

Description of the health body's strategy for meeting the service requirements, including how the proposed development will meet those requirements and its impact on other NHS Board areas served by the health body;

Justification of the assessment of future services and functions required by reference to the health bodies requirements, projected catchment population, changes in medical technology, and other factors influencing the demand for services or the health bodies ability to meet demand.

[TAKE CHECK POINTS TO EVALUATION FRAMEWORK]
Checkpoints:

1. Is the capital investment consistent with the overall strategic objectives of the health body as detailed within the Initial Agreement?
2. Has the strategic need for change been detailed?
3. Have the strategic objectives/clinical need and outcomes in which the project sits been linked to the Local Health Plan?
4. Have the strategic objectives/clinical need and outcomes in which the project sits been linked to the Property/IT strategy?
5. Has the clinical need for the project been established and have the services to be affected been identified?
6. Has a description of the health body area, catchment area and population been provided?
7. Has the Local Health Plan, the strategic direction and business objectives of the health body been detailed?
8. Has an overview of the health strategy for the whole health body area been included?
9. Has the health body detailed the impact of relevant local and national reviews which might have a bearing on where and how different types of services are to be provided?
10. Have the current activities and the range and quantity of healthcare services been detailed?
11. Has the impact of the project on current and future services provision been detailed?
12. Does the project appear within the health bodies strategic financial plans?

13. Has the health body assessed and detailed the current assets and manpower and how they will be affected by the change?
14. Has the health body conducted an assessment of current service performance against requirements?
15. Does the project form part of a coherent local strategic services strategy, which will be sustainable in the long term?
16. Has the health body detailed the description of the service requirements, including how the proposed development will meet those requirements?

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Business Case Stage 3 Define objectives and benefit criteria

Project Objectives and Scope

This section must include a description of project objectives and their link to the NHSScotland Body (ie) 's strategy and overall business objectives, the desired benefits and why these cannot be delivered under the current configuration of the estate. Objectives should be SMART (S, Measurable, Achievable, Realistic, have Timescales attached)

The objectives should be set within the context of their importance relative to the local health plan and relative to eachother. Any constraints on the means of achieving the objectives of the investment should be stated.

Stakeholder involvement is crucial to the success of any programme/ project and whilst the processes for stakeholder involvement in the LHP should be briefly outlined, the processes for involvement in the case in question should be detailed. This section of the OBC should demonstrate that there is stakeholder sign up to the project objectives and benefit criteria against which options will be assessed.

The emphasis within the OBC is not about inputs but outcomes. How will the options assessed meet the stated objectives and deliver required benefits. This section of the OBC should therefore define what the critical success factors are and how the benefits are to be measured once the scheme is completed. This is crucial to the review processes required at later stages in the project lifecycle.

Responsibility for this section is split between ASD and PM. ASD's contribution appears below, and should follow the material provided by performance management for this section.

Identifying Benefit Criteria

Benefit criteria are used to select and evaluate the options that will be generated in the next stage of investment appraisal (Step 4). They are derived from the service objectives and constraints developed and described earlier. They should be developed jointly by all interested parties directly affected by the proposals.

Benefit criteria fall into three categories:

- benefits which can be quantified financially;
- benefits which can be quantified, but not in financial terms; and
- benefits which cannot easily be quantified.

For example, an investment might result in a reduction in building maintenance (can be put in financial terms), or in reduced travelling times for patients (cannot be easily put in financial

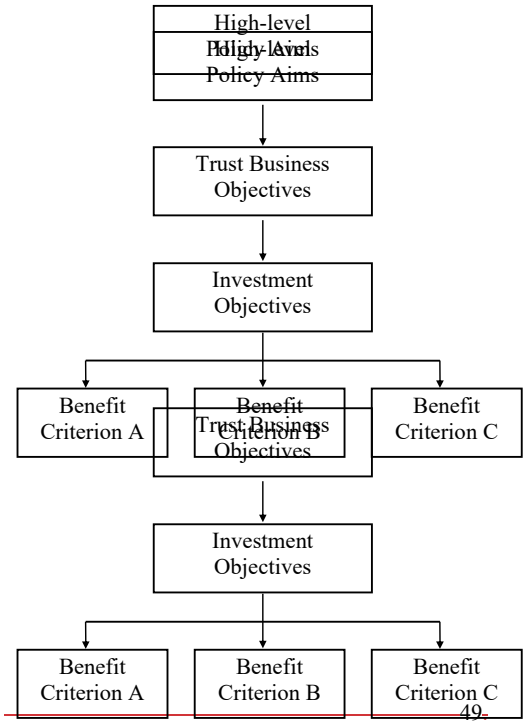
terms, but can be measured) or in increased staff morale through a reduction in time spent filling in forms (difficult to quantify).

Process

The aim is to produce a list of main benefit criteria. These will be used at later stages to produce a short-list of options. They will then be used in the evaluation of the short-list, resulting in the identification of a preferred option (Steps 5 to 8). Each of the main benefit criteria is described by a list of potential benefits (and possibly disbenefits). A process is required that generates a list of benefits which will be sought from an investment, and then groups these under the heading of the main benefit criteria. Criteria which are often used include quality of care, effectiveness of clinical services, accessibility for patients, staffing factors (for example, recruitment and availability of staff), flexibility, environmental quality or marketability of services.

An approach is to consider the hierarchy of objectives headed by high-level policy aims. The expected and desired benefits of meeting each investment objective are identified by descending from the top through the Trust business objectives. This generates a long list of benefits which are then classified into common groups of main benefit criteria. This 'top-down' process is illustrated in Figure 3. As a consequence of the link between the benefit criteria and the objectives, the relative importance of each criterion should be apparent.

Figure 3: Identifying Benefit Criteria (Top Down)



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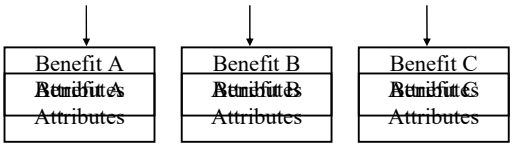

Cost savings

Where benefits can be expressed in terms of cost savings, they will be included in the costing analysis of options. Cost saving must not be treated as a benefit criterion, otherwise this aspect of an option will be appraised twice; as a component of both the cost analysis and the benefit analysis.

Costs and benefits that have not been valued should also be appraised; they should not be ignored simply because they cannot easily be valued. Where possible, full Cost Benefit Analysis should be undertaken for policy appraisal, which includes placing monetary values on benefits. In practice, it is very difficult to value all benefits in monetary terms; for example, to identify and assess the value realised by reduced ill health in a population. The method more usually adopted is to compare the costs and identifiable cost savings of alternatives alongside judgements of the relative benefits released by each option. This is the approach set out in this guide, and it should be used for all capital investment decisions where both the costs and benefits of various alternatives differ. In every appraisal, all cost and benefits must be clearly described, and should be quantified where this is possible and meaningful.

Where the aim is to minimise costs for a given level of benefits or to maximise benefits for a given cost, cost-effectiveness analysis is used. This method accordingly concentrates on one of the two aspects, costs or benefits, and appropriate techniques, described in this guide applying to each of these aspects must also be used. (Steps 5 and 7 applying to benefit analysis, or Step 6 applying to cost analysis).

A third type of appraisal is pure financial appraisal. This measures benefits simply by analysing the income generated from the excess of receipts (from sales or charges) over costs. In the NHS context, such an appraisal will take the form of a check to establish whether income will cover costs, so that Trusts fulfil their financial duties.

[THIS SECTION NEEDS TO BE REVIEWED BY FINANCE]

Outputs Produced from Step 3:

1. Statement of objectives for the investment.
2. List of benefits which the investment will seek to obtain.
3. Benefit criteria for the selection and evaluation of options.
4. Decision on the type of investment appraisal method to employ.

[TAKE CHECKLIST TO EVALUATION TEMPLATE]
Checklist:
Defining Objectives and Identifying Benefit Criteria

1. Identify the high-level policy aims for the Trust.

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2. Identify and review the Trust business aims and objectives.

3. Formulate objectives for the capital investment strategy that are SMART (specific, measurable, achievable, relevant and time-linked).

4. Check that the chosen objectives concentrate on results rather than the means of achieving them.

5. Rank objectives in customer's order of priority.

6. Identify the benefits that will be realised by meeting the objectives set for capital investment.

7. Classify the benefits into groups of benefit criteria.

Business Case Stage 4 Generate Options

Options considered

The purpose of this stage of the process is to identify the widest possible range of options, which could meet the objectives identified in Stage 3 and provide the benefits associated with those objectives. The list of possible options should include non-capital options, both publicly and privately funded options where appropriate and a 'do nothing' or 'do minimum' option, which should provide a basis for comparison. This stage also involves the reduction of the long-list of options to a short-list to be evaluated in detail in later stages of the appraisal process.

Option Generation Process

The option generation process should start with the conception of a long list of possibilities by reference to the investment objectives and Initial Agreement. The work done in producing the Initial Agreement will already have explored the possible range of options. Whilst this can be used as the starting point for generating the long list, this range should be revisited and, where necessary, revised to take account of any developments since the IA was produced. It should also take account of any comment provided by CIG on the Initial Agreement – such comment may, for example, suggest further options for consideration.

The drawing up of a long list of possibilities provides an opportunity to be creative and innovative, to challenge constraints, and to revisit the objectives of the investment. Radical options should be considered at this stage as the consideration of more innovative options can be useful in testing the parameters of feasible solutions, even where more radical solutions are thought unlikely to make the eventual short-list of options. In short, it is crucial to ensure that no option is omitted which might later have been developed into a credible value-for-money solution.

Consultation

In order to reflect a wide range of views it is important that the NHS body considers the possibility of consulting other parties in drawing up a long list of options. The particular parties that might be consulted will depend on the nature and scale of the investment. However, managerial, professional, clinical and teaching staff from the Board could be involved. The public body may also consult purchasers and other outsiders, including the private sector where appropriate.

Consultation can also inform the shortlisting process, for example, through involvement in prioritising the benefit criteria, which will later be used in assessing the options.

Long List

It is likely that brainstorming sessions will generate a large number of ideas for options. When analysis of options begins, it may be apparent that many of the ideas duplicate others or are not feasible. Through identification of duplication and common characteristics, it should be possible to reduce all the ideas to a 'long list' of perhaps between 5 and 12 options (although not limited to this range) each with a number of sub-options. The long list should include a wide range of solutions although large, inflexible schemes are discouraged. The following should be considered in preparing the long-list:

- a base option ('do nothing' or ' do minimum');

- non-capital solutions, such as:
  (a) buying in services from elsewhere;
  (b) getting the private sector to provide services under contract:
  (c) delivering services away from the main hospital site;
  (d) leasing rented facilities

- options to refurbish facilities, short of major upgrading:
  (a) building/systems repair;
  (b) replacement of plant and equipment;

- options to make better use of existing facilities by adaptation or re-arrangement;

- rationalisation options which release savings from land sales or running cost reductions and help to reduce backlog maintenance;

- options to upgrade or adapt the existing stock/information system;

- joint venture solutions and other ways of using private sector capital;

- new building options on the existing site

- total replacement of existing information system to provide an integrated networked system, e.g. Hospital Information Support Systems (HISS); and

- a radical solution, such as total replacement on a green-field site.

The OBC should include documentation on the long-list of options, including a description of the characteristics of each option considered, with reference to the project objectives.

Shortlist

In order to keep the appraisal process manageable, the long-list of options generated should be reduced to a shortlist prior to carrying out a detailed appraisal of each of the options. However, there is a risk that the process of reducing the long-list of options to a short-list will eliminate the optimal solution before it is given full consideration. As such, in producing the short-list, a balance should be struck between keeping the appraisal process manageable and retaining a wide range of potential options. It is recommended that a minimum of three options are taken forward to the shortlist.

There are no fixed rules for producing a shortlist from a longer list of options, rather the process is dependent on judgement as to the characteristics of each option and with reference to their fit with the benefit criteria derived in Stage 3. Nevertheless some further principles may be helpful in producing a shortlist:

- although the costs of options will not have been explicitly identified at this stage, it should be possible to sift the long list and eliminate options which are clearly unaffordable;
- some options may be clearly identified as inferior, when compared with another option, and eliminated. Inferiority is demonstrated either in terms of fewer benefits delivered at higher or equal cost, or the same level of benefit delivered at a higher cost;
- where options are similar, in that they provide comparable benefits by the same method, a single, representative option should be identified and used in subsequent stages of analysis This will ensure that the evaluation contains a full cross-section of options which deliver benefits;

- some options may be impractical or infeasible; for instance, a green-field option where a site search produces no suitable locations;
- non-capital solutions should be given equal attention in the sifting process.

Options which are chosen at this stage will then undergo formal cost-benefit analysis (Stages 5 to 8 below). The reasons for discarding options should be recorded. The basis for short-listing options should reflect purchasers' preferences and may be discussed with the ME.

The Baseline: The 'Do Nothing' or 'Do Minimum' Option:

As noted above, the shortlist of options should include a 'do minimum option', where the NHS body undertakes the minimum amount of action necessary. It may be that a 'do nothing' option is considered unacceptable or impossible. However, by including a 'do minimum' option, it is possible to demonstrate the implications of doing nothing. Against this baseline, the relative benefit of other options can be assessed. The *additional* benefit of other options can then be considered along with their *additional* cost. This allows an assessment of the vfm of higher-cost options.

The 'do minimum option' may involve understanding the cost of merely maintaining the current level of service, over the full lifetime of the proposed project. Significant resource input may be required just to maintain the status quo: that is, doing the minimum. Buildings or plant may have come to the end of their useful life and may require replacement or upgrading. If the throughput of patients is increasing, maintaining the service provision may take additional costs in staff, energy and other running expenditures. The effect of doing nothing might be that the life of the option is limited.

Describing the Short-listed Options

For the OBC, short-listed options should be described in sufficient detail for the benefits and costs to be understood and assessed in later stages of the appraisal. They should, therefore, include factors such as:

- intended outcomes (objectives: health gain, etc.);
- expected workloads and throughput (in-patients, day cases, out-patients, etc.);
- functional content (beds by specialty, support services);
- accessibility (for patients, staff, visitors, etc.);
- staffing consequences (increase, reductions, etc.);
- phasing (and interim impact on services);
- implications for the estate (future developments, land sales, etc.);
- effects on other services (following implementation);
- flexibility to accommodate changes in circumstances;
- expected impact on performance indicators; and
- impact on financial performance.

Private Finance Options [SUPERCEDED BY STAGE 9]

All OBC's must include full consideration of the possibility for the use of private finance in taking forward a scheme. Experience has shown that it is only in certain areas that firm private finance proposals are forthcoming at this stage in the business case process. The tendency has been that it is during the work to prepare the Full Business Case that Private Finance solutions would normally be sought. The key reason for this is that private sector interest is unlikely to be attracted until a clear idea of the required outputs emerges, together with evidence of purchaser commitment and ME support, if required. This is normally only likely to occur once the OBC has been finalised.

Where a clear private finance option exists, it is advisable to begin work on preparation for the procurement process during the OBC stage, including consideration of risk allocation and contract frameworks. More details of this process are included in the 'Private Finance Guide'.

The OBC should include a discussion of the interest shown so far by the private sector, including the likelihood of interest in the scheme once it moves to Full Business Case stage. NHS bodies, in pursuing private solutions, will need to devise a plan and timetable for testing private finance. It is desirable to give thought to this as early as possible. Therefore, the OBC should contain a plan for subsequent stages in seeking private finance.

In certain cases, schemes are not likely to attract private interest. The PFCU will be able to advise on the types of scheme affected. To avoid wasting time and resources, where no interest is forthcoming and no precedent for the case of private finance in such a scheme has been set, the ME can agree with the NHS body that public finance only will be sought.
[ASD have made little change to this section – any comments from others welcome.]

Outputs Produced from Stage 4:

1. A long list of options which support the NHS body in meeting its business objectives and are consistent with the objectives of the investment; some options might be non-capital solutions, and others might use private sector capital.

2. Documentation of the long list of options

3. An analysis supporting the short-listing of options identifying those rejected because of identified constraints, inferiority or poor match with benefit criteria.

4. A short-list of options that are considered acceptable and feasible for cost benefit analysis.

Checklist: Generating Options

1. 'Brainstorm' to produce a wide range of initial ideas for meeting the objectives.

2. Consultation appropriate to the scale of the project should be undertaken in producing a long list of possibilities.

3. Consider a wide range of options, taking account of minimal, non-capital, private finance, radical and imaginative ideas.

4. Ensure that the long list includes 'do nothing' or 'do minimum' choices.

5. Briefly describe each of the long-list options; document these and the process used to arrive at them.

6. Sift the long list to reject options that are not feasible, unaffordable and which do not meet the benefit criteria.

7. Aim for at least three options on the short list; keep a 'do nothing' or 'do minimum' option on the short list.

8. Ensure that the short-listed options are consistent with investment aims and objectives.

9. Produce descriptions of the short-listed options in sufficient detail for more detailed appraisal at later stages.

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Business Case Stage 5 Measure the benefits

Benefits Appraisal

Where possible, full Cost Benefit Analysis should be undertaken for policy appraisal, which includes placing monetary values on benefits. In Health appraisals however it is often exceptionally difficult to place credible monetary values on many of the different benefits generated by public expenditure (For instance, replacing or upgrading an old hospital building). In such cases it may be more appropriate to undertake an appraisal on the basis of it's cost effectiveness, with a comparison of the benefits of different schemes based on multi-criteria analysis for assessing different options. Such analysis can be carried out through ranking and weighting different options to give an overall benefit score for each option as discussed below[1]. For capital schemes generally this is what we would expect. However, regardless of the ease with which benefits can be quantified, every appraisal should include a full description of costs and benefits, and these should be quantified where it is possible and meaningful.

This section describes an approach to evaluating the benefits or disbenefits of each option that cannot readily be quantified. The purpose of evaluating the non-quantifiable or non-financial benefits is to provide as much information on costs and benefits as possible. This will better inform the decision making process at the stage of identifying the preferred option. Merely ranking options from greatest to least non-financial benefit does not provide any information on the *degree* to which the non-financial benefits of each option vary. It is difficult to judge the desirability of each option if there is no assessment made of the relative non-financial benefits of those options.

This section deals with non-financial benefits. Those which can be quantified in a financial sense (e.g. cost savings) should be included in the cost analysis of options. Just because some benefits cannot be easily quantified does not mean to say they should be ignored. In some investment proposals, non-financial benefits can be of prime importance in the overall process of deciding on a preferred option e.g. investments in Information Management and Technology (IM&T).

Weighting and Scoring of Benefits

A procedure in common use in investment appraisal is to weight and score the benefits accruing to each option. This technique is sometimes called multi-criteria analysis. The construction of weighted benefit scores is more robust than, and preferable to, simply ranking options. The basic approach to weighting and scoring involves assigning weights to criteria, and then scoring options in terms of how well they perform against those weighted criteria. The weighted scores are then summed, and these sums can be used to rank options. Even if carefully identified benefit criteria are used by an evaluation team to judge the order of merit of each option the process is weak because it gives no clear measure of the degree to which one option is better than another. The process of weighting and scoring options described in more detail below is more rigorous and less subjective than even a thorough process of simply ranking options.

[1] A full discussion of the techniques of Willingness to Pay, Revealed Preference and particularly Multi-Criteria Analysis is provided in the Treasury Green Book. An introduction to multi-criteria decision analysis – weighting and scoring – is given in *Multi-Criteria Analysis: A Manual* available from the ODPM website: http://www.odpm.gov.uk (see DTLR archive)

Trusts will be expected to show that they can identify, weight and score any benefits they expect to accrue to the various options and to record the results of such an exercise as part of the overall business case. There are a number of alternative ways of identifying weights for benefit criteria. The recommended approach to scoring options and weighting benefit criteria is to involve people with a broad range of representative views. These will include members of the business case project team and other interested parties, and include, where appropriate, representatives from the Trust's main purchasers. It is also important to have some independent participants who can help to ensure that decisions are as objective as possible and not biased by individual preferences for a particular solution. Objectivity is further enhanced by separating the exercises of scoring the options from that of weighting the benefit criteria.

Scoring and weighting are best performed by the representatives in a workshop session. Alternative ways of identifying scores and weights, such as using questionnaires, may be less successful. The workshop can ensure that:

- there is common understanding of the definition of each option;
- there is common understanding of the definition of each of the benefit criteria;
- a variety of views are expressed about the relative importance of the benefit criteria;
- any differences in opinions related to weights for benefit criteria are identified and recorded; and
- at the end of the process there is agreement to the weights assigned to criteria.

Weighting the Criteria

The following approach to weighting the criteria is recommended:

a) Having scored each of the options against each of the benefit criteria, establish the relative importance of criterion. This is done by estimating a weighting for each criterion.

b) This is simplified if the benefit criteria are first given a relative ranking. The most important criterion is ranked the highest and given weight of 100. This provides a useful reference point.

c) Each of the other criteria is then examined against the most important criterion. This is performed by carrying out a series of 'pairwise comparisons'.

d) A pairwise comparison consists of selecting another criterion and deciding how much less important that criterion is than the most important criterion.

e) For example, if the first criterion is assigned a weight of 100, and the second criterion is considered to be half as important, then a weight of 50 is assigned to the second criterion.

f) Steps (a), (b) and (c) are then repeated for each successive pair of criteria, until each has been weighted (i.e. the first and second criteria, then the second and third, and so on).

g) The weights for each criterion are then scaled to total 100 and recorded.

Scoring of Options Against Benefit Criteria

The following practical approach is recommended for scoring options according to each of the benefit criteria discussed in the workshop session:

- each option is examined in turn against each of the benefit criteria. A brief description of how that option meets the criterion is agreed upon. Options are not scored at this stage;

- each of the options is then scored, for example, between 0 and 10, on each of the criteria. The descriptions agreed upon above should make this process considerably easier. Although it can be difficult to agree on exact scores, it is usually easy to rank the options in order. The better the option performs, the higher the score that should be awarded. The scores, and the reasons underlying the scores, should be recorded.

It is important to remember that the scoring of options is not an exact science and is to a certain extent a subjective process. However, given a wide range of representative views, this subjectivity can be reduced. The end result is ideally a collective and objective view of the practical benefits that will be received from the implementation of each of the options.

Some options will almost certainly bring benefits sooner than others. The evaluation team will have to assess whether the timing of benefits is an important factor. Timing can be handled as a benefit criterion in itself and can be treated like other benefit attributes i.e. given a weight and then each option scored according to when the benefits would be released. A more sophisticated method is to set out the time profile of benefit scores for each option, weight the scores according to when the benefits are released, and calculate a time-weighted average.

Having assigned weights and scores to each option, the figures should then be multiplied together to provide a total weighted score for each option. Table 1 gives the type of format in which weighted scores can be calculated and recorded using details of a fictitious example. It should now be possible to rank options in terms of benefits, make a judgement as to the relative level of benefits in each option and to identify a preferred option on the basis of benefits only.

Baseline Benefit Levels

It is important to try and distinguish between the benefits derived from each option and the benefits that would have been derived anyway. The total benefit of the 'do nothing' option is the baseline for comparison of the benefits of other options. The benefits of doing nothing (even if there are none) must, therefore, be assessed in the same way as the other options.

Recording the Result

The process and reasoning behind the scores and weighting must be clearly documented to demonstrate that a robust analysis has been carried out. Again, it is important to recognise that the assigned weights, and the scores given to options, are value judgements. In order to assign weights and scores, negotiation and compromise needs to take place. It is the number of people involved in the process and their expertise that lends credibility to these value judgements. It is therefore worth spending some time on choosing a representative benefits team which should be named as part of the recording process.

Outputs Produced from Step 5:

1. Identification of weights for benefit criteria.
2. Identification of scores for each criterion for each option.
3. Total weighted scores for options.
4. Current level of benefits achieved (baseline benefit).
5. A preferred 'benefits' option.

Checklist: Measuring the Benefits

1. Confirm the benefit criteria (attributes) that will be used to rank options.
2. Select an expert and representative team to weight and score the benefits of each short-listed option.
3. Give a weight (0 to 100) to each benefit criterion.
4. Give a score (1 to 10) to each option on each of the benefit criteria.
5. Multiply weights and scores to provide a total weighted score for each option.
6. Rank options in terms of benefits and identify the preferred option on the basis of benefits.

Table 1: Weighting and Scoring Benefits

Benefit Criteria	**Benefit** Criteria	**Option A** Score	Weight & Score	**Option B** Score	Weight & Score	**Option C** Score	Weight & Score	**Option D** Score	Weight & Score
Quality of clinical care	30	0	0	0	0	7	210	10	300
Patient access	15	0	0	1	15	4	60	10	150
Flexibility of accommodation for alternative use	20	0	0	4	80	6	120	9	180
Quality of hotel services	20	0	0	5	100	4	80	3	60
Disruption to services	15	0	0	0	0	3	45	7	105
Total	100		0		195		515		795

Development of benefit analysis

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Multi-criterion analysis is just one method that can be used to appraise investments; another method that can be used is Discrete Choice Modelling (DCM). The future introduction of DCM will help with the decision making process enabling Health Boards to come up with more clearly defined and robust options. DCM asks respondents to make choices between different scenarios. These choices will involve an element of trade-off some characteristics for others and therefore incorporate opportunity cost into the evaluation process.

Health ASD in conjunction with HERU are evaluating DCM's suitability for health investment projects with the intention of DCM being used as the primary method for investment appraisal. Once a decision has been made on DCM's suitability SCIM will be updated accordingly.~~[ASD COLLEAGUES INSERT SECTION ON FUTURE DEVELOPMENT OF BENEFITS ANALYSIS]~~

Business Case Stage 6 Identify and quantify the costs

9b. Financial Appraisal

9b.1 identification and assessment of capital and revenue costs associated with shortlisted options over the life span of the scheme using the standard format of SCIM forms FB1 and FB2 but headed OB1 & OB2;

9b.2 a statement of how much the NHS Board is prepared to spend on the services to be covered by the proposed project;

9b.3 revenue implications of the preferred option (including capital charges and the net effect on prices). This estimate should make allowances for the cost of risk and the full lifetime costs of a scheme, including provision for equipment and IM&T at the start of, and during, the project. If refurbishment is required at any stage in the project's life, this should be included in the savings;

9b.4 impact on the Trust/Board's balance sheet, cash flow position and operating cost statement;

9b.5 key assumptions underlying the financial appraisal and explanation of the methodology used to project income and expenditure;

9b.6 full sensitivity analysis on the key assumptions behind the financial appraisal;

9b.7 explanation of how the cost of risk has been factored into the financial appraisal;

9b.8 assessment of whether there is flexibility to fund any additional revenue requirements and likely source of funding (e.g. disposal of surplus land);

9b.9 evidence of NHS Board involvement in the development of the project (including confirmation that the project is affordable, complies with the Local Health Plan and will be properly managed).

9c Economic Appraisal

The purpose of the economic appraisal is to establish the relative value-for-money of each of the options shortlisted at the OBC stage. Economic appraisals are used extensively in the public sector to identify the option that provides the best value for money to the public sector, and to provide a robust basis on which a decision can be made to invest in a proposed development.

It is clearly important to ensure that the economic appraisal is based on reliable and robust information and that the calculation is sound. Furthermore, the presentation of the conclusions and the assumptions on which those conclusions are based can be as important as the analysis itself. The Department of Health has created a Generic Economic Model (GEM) to support the calculation and presentation of the economic appraisal for NHS building schemes involving major capital expenditure. The model is aimed at NHS bodies responsible for preparing both OBC and FBC reports and is intended both to simplify the process so far as possible, and to promote a consistent format for the presentation of the economic appraisal results.

The Generic Economic Model should be used to prepare the economic appraisal. ~~The guidance is not repeated here, but rather a brief summary of the principles is set out below.~~ Appraisers should follow the following links to reach the appropriate guidance. For both the OBC and FBC stage of the business case process, there are 3 separate elements to the GEM:

- The model itself (in excel format) [html reference]
- A user guide to the model [html reference]
- A set of Economic Principles to be followed in using the model [html reference]

The last of these documents sets out the key principles that apply to the economic appraisal of major Public Health Sector Investments. This covers, for example, the appropriate cost base to be used, the importance of establishing the opportunity cost of resources used, the relevance of the baseline cost in the option appraisal, etc. To avoid duplication, these principles are not repeated in full here. However, they should be assumed to be a central part of the economic appraisal process and relevant to all business cases to which the SCIM applies. In particular, the economic appraisal will be expected to respect the following conventions:

- The total cost of the 'do-nothing' or **'do-minimum' option** is the baseline for comparison of the cost of the other options. The baseline cost will often be the cost of extrapolating into the future the present running costs of the Trust on the assumption that the existing estate remains and is maintained in its present condition;

- Treatment of all options must be consistent and **all relevant costs should be included**. There are two notable exceptions: VAT should be excluded as it is not a true cost but a transfer between public bodies with no resource implications and, capital charges should be excluded as the discounting technique already includes the true capital costs of the project;

- The concept of **'opportunity cost'** is critical to economic appraisal. The cost of resources used in each option should reflect the value of those resources in their alternative, next best use. Market prices usually reflect the best alternative use that goods or services could be put to;

- Costs and savings should be expressed in **real terms**, that is after removing any allowance for general inflation. However, where there is evidence to suggest that certain elements of cost will increase/decrease at a rate significantly different to inflation, such 'real terms' price increases/decreases should be reflected in costings. GEM guidance provides further details;

- the impact of **running costs** is as important as capital costs in assessing the vfm of schemes. It should not be assumed that running costs will not change from the 'do-nothing' option without carrying out a detailed assessment of revenue costs for each option;

- The **phasing** of capital expenditure on land, building, fees and equipment must be identified and allocated to the year in which the cash expenditure will actually be incurred. Similarly, the timing of receipts from any sales of land, building or equipment must be ascertained. The phasing of costs has an impact of the cash flow of each option. This has implications for the discounting of options, affordability and prices;

- The **wider effects** of options should also be considered – this is set out in some detail in the GEM guidance, under the heading of "Revenue Externalities – Displacement Costs";

- Where appropriate, the **residual value** of assets should be allowed for. Where the economic life of assets is greater than the period of the appraisal, the residual value of the assets should

be included in the final year of the appraisal. The residual value can be taken as the lower of net asset value after deducting accumulated depreciation or expected market value.

The Treasury Green Book [footnote Green Book] also provides useful guidance on appraisal and evaluation and should be read in conjunction with this guidance.

Optimism Bias

Optimism Bias refers to the tendency when evaluating publicly funded projects to overestimate the benefits and underestimate the costs associated with such projects. Evidence indicates that public sector procurement options typically suffer from optimism bias in the estimation of costs and benefits[2]. The project costs, duration or benefits are considered optimistic when they do not fully reflect the risk of cost and time overruns or shortfalls in the delivery of project benefits.

Optimism Bias is one of four types of risk that commonly arise in appraisal, along with Uncertainty/Project-specific Risk, Irreversibility and Variability. These other forms of project risk are set out in more detail at Business Case Stage 7 and are an important adjunct to the economic appraisal. Optimism bias is considered to be an integral part of the economic appraisal itself. Optimism bias requires to be accounted for over and above other types of risk and the Green Book requires a specific adjustment to be made to reflect the importance and persistence of this cost.

Part of the Treasury rationale for moving towards separate identification of optimism bias is to encourage better risk management in the public sector procurement process. Risk management is a structured approach to identifying, assessing and controlling risks that emerge during the course of a public procurement project. Risk management should aim to, as far as possible, eliminate those issues that cause cost and time overruns, and benefits shortfalls.

Explicit guidance has been created which sets out the appropriate level of adjustment for optimism bias that should be applied to different types of projects. The actual adjustments to be made and the justification behind these adjustments is set out in an appendix to this paper. These adjustments are based on a survey of previous public sector health procurement projects. This survey assessed the typical optimism bias levels associated with different types of project and provides an indication of the level of optimism within estimates of project costs, duration and benefits. These adjustments are subject to revision in future as evidence of the typical extent of optimism bias is updated. ~~The project costs, duration or benefits are considered optimistic when they do not fully reflect the risk of cost and time overruns or shortfalls in the delivery of project benefits.~~

It is important to note that specific figures for optimism bias set out in this Guidance are intended to represent starting points from appraisers can begin to estimate the appropriate extent of optimism bias at any stage of the appraisal process. In particular, where evidence exists locally, this should be considered in conjunction with optimism bias factors prescribed here. The adjustment for optimism bias is designed to compliment and encourage, rather than replace, existing good practice in terms of calculating project specific risk adjustments. However, in all cases, the rationale behind the use of the particular factors adopted should be set out in detail at each stage in the business case process.

These issues are discussed further in the relevant Appendix, accompanied by a detailed example.

[2] Private procurement options also suffer from optimism bias to a lower extent as set out in Treasury Green Book guidance.

As noted in the 'Guide to Using the Excel OBC/FBC Generic Economic Model', the GEM allows for the inclusion of an allowance for optimism bias in the economic appraisal, as set out under the 'Risk Adjustment and Optimism Bias' section. Where such an adjustment has been made, this should be made explicit in the presentation of the results.

Discounting

Discounting is a technique used to compare costs and benefits that occur in different time periods. It is based on the principle of 'time preference', namely that people prefer to receive goods and services sooner rather than later. Society as a whole, prefers to receive goods and services sooner rather than later, and to defer costs to future generations. This is known as 'social time preference' and the 'social time preference rate' (STPR) is the rate at which society values the present compared to the future.

Use of a discount rate incorporating the concept of the social time preference rate allows the calculation of the *present value* of costs and benefits occurring at various points in the appraisal period. The summation of these present values provides the net present value (NPV) of an option. The NPV is the primary (though not the only) criterion for deciding whether government investment can be justified. In all cases economic appraisal of business cases should be consistent with Treasury Green Book guidance on discounting future cashflows [reference].

If it were possible to accurately value all costs and benefits on the basis of the discounting exercise the option with the highest net present value would be preferred. However, it is more usually the case in appraising NHS options, that it is not feasible to place a monetary value on some benefits, which might nevertheless be significant in terms of the criteria established at Stage 3. As such, it is more usual to compare options in terms of either: the cost of achieving a given set of objectives at least cost (where the preferred option is that option with the lowest net present cost (NPC)) or; the level of benefits achieved per unit of cost (where the preferred option is that option with the highest level of benefit per pound of expenditure).

Appendix * provides information on discounted cash flow techniques used to compare option costs, including a worked example of discounting. The final cost analysis must be discounted at the appropriate real rate, currently 3.5% to give its present value. For projects with very long-term impacts, over thirty years, a declining schedule of discount rates should be used rather than the standard discount rate. Appendix * contains a schedule showing the recommended discount rate for projects whose costs and benefits accrue over different lengths of time.

From the 1st of April 2003, the introduction of the new Treasury Green Book guidance required a new discount rate of 3.5% (as set out above) to replace the previous discount rate[3]. This new discount rate should be used in all appraisals and supercedes any default discount rate contained within previous guidance.

Risk and Uncertainty in the Economic Appraisal

As explained at Stage 7 below, risk analysis at OBC stage has a number of purposes, one of which is to contribute towards the selection of the preferred OBC option. Guidance on the identification and measurement of risks at the OBC stage is set out in detail in Stage 7. However, at this stage, it should be noted that an initial assessment of the costs and risks of a PFI alternative to OBC options can be

[3] The reduction in the discount rate to 3.5% from its previous level of 6% reflects an unbundling of the discount rate so that the new rate encapsulates time value of costs and benefits only, where before the discount rate also accounted for Optimism Bias, which is now considered separately (see below guidance on Optimism Bias).

entered into the GEM to provide an early indication of the potential impact on Value for Money. This adjustment should be calculated separately from the model and input into the spreadsheet prior to presenting the results.

Results and Presentation

The purpose of the economic appraisal is to inform the ultimate decision as to which option should be pursued. Stage 8 below sets out the process by which the preferred option is identified. The decision on the preferred option will be subject to a number of influences. However, the results of the economic appraisal would be expected to have a significant bearing on this decision. As such, the presentation of the results of the economic appraisal should be simple and transparent.

The output of economic appraisals is normally represented by a series of NPC or EAC calculations, one for each option, together with an assessment of the risks associated with each option. The option that generates the lowest NPC/EAC is the best value-for-money option and represents the preferred option on economic grounds, based on the costs and benefits included in the economic appraisal. However, as set out in Stage 8, the final decision on an NHS investment scheme should also take account of the non-financial advantages and disadvantages of the shortlisted option.

The GEM facilitates the presentation and interpretation of NPC/EAC findings. Appendices to the GEM guide show the summary tables which can be produced to aid presentation of results. Equivalent Annual Cost calculations are a useful indicator of the relative value of different options where options have different lifespans.

As well as presenting the results of the NPC calculation, it is important that the key assumptions underlying the assessment of costs, benefits and risks in the economic appraisal are set out in some detail in the OBC.

Sensitivity

Sensitivity analysis is fundamental to appraisal. It is used to test the vulnerability of options to unavoidable future uncertainties. However well risks are identified and analysed, the future is inherently uncertain. Whilst an expected value for each option is a useful starting point in judging relative merits, it is also essential to consider how future uncertainties can affect the choice between options. Further information on sensitivity analysis is set out at Stage 7.

Outputs Produced from Stage 6

1. Identification of existing costs.
2. Identification and valuation of capital costs of each option.
3. Identification and valuation of running costs of each option.
4. Calculation of capital and running costs of each option.
5. Documented description of the cash flow projections of each option.
6. A least-cost option.

Checklist: Identifying and Quantifying the Costs

1. Identify the total costs of the baseline - the 'do nothing' or 'do minimum' option.
2. Identify all the capital (non-recurring) costs for each option.
3. Identify all the revenue (running) costs for each option.
4. Check that all costs are at base-year (Year 0) price levels (constant prices).
5. Adjust any future costs that will rise or fall in real terms by an appropriate cost index.
6. Develop a costing methodology to project forecasts of future running costs.
7. Combine revenue and capital cost projections to produce forecasts project cash flows.
8. Subtract capital charges and VAT (where this is material) from all costs before evaluating the discounted cash flows.
9. Discount the cash flows using the appropriate discount rate to calculate the net present cost of each option.
10. Rank options by their net present costs to identify the preferred option on the basis of costs.
11. Record the results, ensuring that assumptions are documented.

Business Case Stage 7 Assess sensitivity to Risk

Risks and uncertainty appraisal

By this stage, preferred options in terms of benefits and costs will have been identified. A number of assumptions will have been made in assigning costs and benefits which, because they concern uncertain future events, must be tested. Sensitivity analysis is the step in the investment appraisal process which aims to examine the robustness of the ranking of options. The most robust options are those which, even if the assumptions upon which they are based turn out to be different, deliver the same benefits with the least variation in projected costs.

Before sensitivity analaysis can be carried out, however, appraisers should calculate an expected value of all risks for each option, and consider how exposed each option is to future uncertainty. A final assessment of the relative merits of different options cannot be made until risks have been properly evaluated. Throughout the appraisal process, steps should be taken to prevent and mitigate both risks and uncertainties. It is important to be transparent with regard to the potential impact of risks and bias on their proposals.

Analysing Risk

Risk arises from the possibility of more than one outcome occurring, with the likelihood that something will not turn out as planned or expected. The major categories of risk to be considered in NHS capital investment appraisals are:

Optimism Bias: refers to the tendency when evaluating publicly funded projects to overestimate the benefits and underestimate the costs (see above).

Uncertainty/Project-specific Risk: The projected costs and benefits of an option will always be subject to some uncertainty. Assumptions made, such as for building on-costs, the scope for future efficiency savings or the precise level of future demand, are normally indeterminate, and particularly so at the Outline Business Case phase.

Irreversibility – arises where implementation of a proposal might rule out later investment opportunities or alternative uses of resources, for example in the case of destruction of natural environments or historic buildings.

Variability: Where the range of possible out-turns of an option is wide, it is subject to variable risk. The range of variability may be different between options under consideration, and adverse outcomes may fall more heavily on some areas of the Trust's activities than on others and seriously affect particular groups of individuals.

9d.2 estimated cost of risk associated with the leading options (both risks likely to be retained by the public sector and those likely to be transferred);
[Note: transfer of risk will not apply if PPP/PFI has been ruled out at this stage]

It is good practice to add a risk premium to provide the full expected value of the Base Case. As previously explained, this risk premium may be encompassed by a general uplift to a project's net present value, to offset and adjust for undue optimism. But as the appraisal proceeds, more project specific risks that fall into one of the other three categories of risk described above may have been identified, thus reducing the need for the more general

optimism bias. An 'expected value' (EV) provides a single value for the expected impact of all risks. It is calculated by multiplying the likelihood of the risk occurring by the size of the outcome (as monetised), and summing the results for all the risks and outcomes. It is therefore best used when both the likelihood and outcome can be reasonably estimated.

Example of Calculating Expected Value of Risk

In the following example, a new policy was originally expected to generate significant benefits, but following concerns that the original predictions were over optimistic, further risk analysis has confirmed that there is now considerable uncertainty about some of these benefits being realised. Four potential outcomes are now considered possible, with NPVs and probabilities assessed as follows:

Outcome	NPV (£m)	Probability	Benefits - Expected Values (£m)
1	10	0.2	2
2	20	0.4	8
3	30	0.3	9
4	40	0.1	4
		Expected Value	23

The costs of implementation have been more rigorously assessed at between £12-17 million, with an expected value of £15 million.

The expected net benefit is therefore £8 million NPV.

9d.3 description of the methodology used to quantify and value risks;

9d.4 results of sensitivity analysis on the key assumptions underlying the risk evaluation, including the results of a sensitivity analysis of the non-financial benefits;

Sensitivity Analysis

An expected value is a useful starting point for understanding the impact of risk between different options. But however well risks are identified and analysed, the future is inherently uncertain. So it is also essential to consider how future uncertainties can affect the choice between options.

Sensitivity testing is an approach commonly used to assess the degree of risk in investment proposals. Its purpose is to understand how sensitive the options are to changes in the underlying assumptions that have been made. It involves varying any important and uncertain variables in the appraisal of benefits and costs to consider the effect this has on the conclusions. If the conclusions are not markedly affected, then this contributes to the robustness of the case. The technique is not difficult, and calculations can be automated using simple spreadsheet models. The GEM can be used to explore sensitivities.

Examples of variables that are likely to be both inherently uncertain and fundamental to an appraisal are the growth of real wages, forecast revenues, demand, prices, and assumptions about the transfer of risks. A prior analysis of costs into fixed, step, variable, and semi variable categories can help in understanding the sensitivity of the total costs of proposals.

Sensitivity analysis can help decision makers understand that there are ranges of potential outcomes and helps avoid the spurious accuracy which single point estimates of expected values are prone to.

Again, the GEM facilitates the calculation and presentation of sensitivity by allowing for a number of sensitivity tests to be presented for each option. The GEM also allows the calculation of switching values, which shows by how much a variable would have to fall (if it is a benefit) or rise (if it is a cost) to make it not worth undertaking an option. This can be a crucial input into the decision as to whether a proposal should proceed and should be a prominent part of an appraisal. The GEM guidance provides further details on how to calculate sensitivities and switching values.

Testing Benefit Criteria

A weighted scoring system for assessing benefit criteria is described earlier in the business case process. If only ranking of options has taken place, then a sensitivity analysis of benefits will not be possible.

In sensitivity analysis, both the scores (ratings) and weightings are varied to examine how the ranking of options responds to changes in these variables. The numbers should be altered not by a fixed amount or percentage, but by an amount which reflects the uncertainty. This uncertainty may have been expressed by those who participated in the workshop to assign values. If, for example, there was a considerable disagreement as to a particular weight that should be allocated to a criterion then a large alteration in the weight should be made when performing sensitivity analysis.

Testing Scores

To perform a sensitivity analysis of the scores given to the benefit criteria for an option, the following steps are taken:

1. Determine the agreed range of scores for each criterion.

2. Alter the score for the first criterion within its agreed range and note the result.

3. Repeat the analysis for the scores of each of the other criteria.

4. Note the total benefit weighted score when all scores for the option are at theirmaximum, and when they are at their minimum.

Testing Weights

Performing a sensitivity analysis of the weights allocated to each criterion is more complicated because when the weighting of one criterion is changed, it affects the weighting of the rest:

1. Determine the agreed range of weights for each criterion.

2. For the first criterion allocate the change in weight across the other weights.
3. Adjust the weights arising from the change in weight of the first criterion, and note the result.

~~5.~~ ~~4.~~ Repeat the analysis for the weights of each of the other criteria.

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Clearly a large number of sensitivity analyses on weighted benefit scores can be carried out, by varying different combinations of weights and scores. However, a limit should be applied, reflecting the size of the appraisal and the perceived levels of risk. Because weighting and scoring systems invariably rely on subjective judgements, sensitivity testing is important to highlight the effect of any bias.

Testing Costs

Testing the sensitivity of options to variations in cost involves recalculating the capital and revenue cost calculations with various cost items set at different ranges of values. The discounted cash flow calculations are then repeated to calculate the net present costs that arise from alteration.

It is insufficient to test the sensitivity of the investment options simply by adjusting all costs, or broad categories of cost, by, say, plus or minus 10%. Rather, testing should examine a wide range of possible uncertainties and ask "What if?" questions about all the assumptions that are made; for instance, about:

Costs and prices of the main revenue costs: what if they rise or fall annually in real terms, or with a compounding effect (e.g., labour costs rising by a real 1% per annum, or building maintenance costs changing as property ages)?

Cost expenditures and savings: what if these occur later or sooner than envisaged (e.g., because of delays in realising the benefits of a project)?

Improvements in efficiency or effectiveness: what if these are not achieved at the rate expected (e.g., because staff re-organisation following implementation is more difficult than envisaged)?

The phasing of the project: what if it changes (and the timing of payments is altered, or transitional costs are incurred for longer periods)?

Demand for services: what will the impact be if demand differs from that expected (e.g., if workload, populations, cross-boundary flows are greater or smaller)?

Receipts of cash: what if these are not achieved when expected (e.g., if market conditions mean that land sales do not occur when planned)?

This list is purely illustrative, and planners are expected to critically review the specific assumptions underpinning each option in an appraisal. The probable extent of variation is not likely to be the same in every option, nor to rise or fall by the same amount in optimistic and pessimistic cases. It should be noted too that some parameters will be interdependent, and a change in one assumption may imply a change to another assumption. For example, a rise in labour rates may imply a rise in the cost of another labour-intensive input to the option, such as that for contract services or professional fees in the capital costs.

Switching Values

One particularly effective way of presenting the results of sensitivity testing is to calculate the switching value or crossover point of crucial factors. The switching value is the amount by which the variable would have to change in order to affect the ranking of options. The calculation of switching values can be especially helpful where there is uncertainty about the amount by which project parameters are likely to vary. It can show how much the value would have to fall (if it is a benefit) or rise (if it is a cost) to make it not worth undertaking the option, and a view can often be relatively easily taken about the likelihood of the factor turning out worse than the switching value.

This should be considered a crucial input into the decision as to whether a proposal should proceed. It therefore needs to be a prominent part of an appraisal. The GEM can also be used to explore sensitivities.

Scenario Planning

Scenario planning looks at the effect on the success or otherwise of an option of combining a different number of assumptions about the future. A small number of scenarios (normally optimistic, pessimistic and neutral) is chosen and the expected net present cost of each investment option is calculated for each of the chosen scenarios. Each scenario can itself be tested for sensitivity to changes in the key variable. For investment appraisal the key questions to explore under different scenarios are:

- Does the ranking of options change under optimistic and pessimistic scenarios from the central case?
- How likely are the best and worse cases to arise?
- What would be the effect on affordability and Trust prices of each scenario?

Scenarios can be constructed from data about the project cost and the strategic context within which it is being proposed. For example, a pessimistic scenario might be that capital costs turn out at the top of the possible range, project completion is delayed so that the revenue reductions are later or lower than envisaged, and demand for services is not as high in the medium to long term as projected.

Robustness of Options

Sensitivity testing and scenario planning will highlight the assumptions to which the result of the appraisal of investment options is most sensitive. If the conclusions do not differ when different assumptions are made (that is, a different ranking of options does not result), then the conclusions are likely to be robust. If, under a changed assumption, the results of the benefit or cost assessments alter, then the likelihood that the change in the assumption will arise must be assessed. If this is not very likely, then the choice of the preferred option may remain robust; otherwise the choice is unduly risky.

9d.5 analysis of how probable it is that the various risks will occur;

Identifying Risk

Sensitivity testing makes managers aware of the nature of the risks associated with the most likely options. For example, large information systems projects are prone to risk by virtue of their complexity. This is particularly true for solutions which require some degree of integration, either within the organisation or externally. For the leading options, appraisals should:

- identify the factors that are most certain and those that are least certain;
- identify where uncertainty might be of the most importance, and the implications of key uncertainties for benefits and costs;
- make at least broad quantitative judgements about probabilities and ranges of potential variation of the importance factors determining the outcome;
- highlight cases where the probabilities of under-and over-estimation do not balance out, and assess whether there is optimistic bias (and if there is adjust figures accordingly); and
- consider whether risks and uncertainties justify more flexible designs.

The aim should be to develop options that minimise the major risks. For instance, flexible designs that can accommodate changes in demand or the ways in which health service are delivered, smaller developments that reduce the time and cost overruns associated with large projects, or phased options which provide scope for alteration if circumstances change.

9d.6 description of how risks are to be managed. Where PPP/PFI is an option some/all risks can be transferred to the private sector, but where PPP/PFI has been ruled out at the OBC stage then all risks will be managed by the public sector.

Risk Management

At this point in the Business Case process, many of the significant risks to the leading options will have been identified. It is worthwhile to begin thinking about the formulation of a risk management strategy.

Risk management is a structured approach to identifying, assessing and controlling risks that emerge during the course of the project lifecycle. Its purpose is to support better decision-making through understanding the risks inherent in a proposal and their likely impact. Effective risk management helps the achievement of wider aims, such as: effective change management; the efficient use of resources; better project management; minimising waste and fraud; and supporting innovation.

Active measures to be taken to ensure effective management of risks involve:

- Identifying possible risks in advance and putting mechanisms in place to minimise the likelihood of their materialising with adverse effects[4]
- Having processes in place to monitor risks, and access to reliable, up-to-date information about risks
- The right balance of control in place to mitigate the adverse consequences of the risks, if they should materialise
- Decision-making processes supported by a framework of risk analysis and evaluation.

By reducing risks and uncertainty in these ways, the expected costs of a proposal are lowered or the expected benefits increased.

Assumption of Risk[5]

The question of with whom the primary risks lie should also be addressed. This is of primary importance when considering the use of private finance. The list below indicates the key questions that would need to be answered in a business case.

Who bears the consequences:

- if the requirement is less/greater than forecast?
- if the benefits are less/greater than forecast?
- if the costs are less/greater than forecast?

What are the obligations on each party?

- what rules could be transferred to the private sector?
- what rules might the NHS retain?

What would happen if standards were not met?

What would happen if the contractor became insolvent?

[4] For a comprehensive list of measure that can be taken to manage and mitigate risk, see Appendix *.
[5] For more detail on Assumption and Transferring of Risk, See Appendix *. (TAKEN FROM P82-85 GREEN BOOK).

Ref: Appendix C – Suggested Outline for OBC Risk Analysis

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Business Case Stage 8 Identify the Preferred Option

The purpose of the economic appraisal is to inform the ultimate decision as to which option should be pursued. Stage 8 below sets out the process by which the preferred option is identified. The decision on the preferred option will be subject to a number of influences. However, the results of the economic appraisal would be expected to have a significant bearing on this decision. As such, the presentation of the results of the economic appraisal should be simple and transparent.

Reports should provide sufficient evidence to support their conclusions and recommendations.They should provide an easy audit trail for the reader to check calculations, supporting evidence and assumptions. Major costs and benefits should be described, and the values attached to each clearly shown rather than netted off in the presentation of the analysis.This should help to ensure that decision makers understand the assumptions underlying the conclusions of the analysis, and the recommendations put forward. Appraisal reports should contain sufficient information to support the conduct of any later evaluation.

The results of sensitivity and scenario analyses should also generally be included in presentations and summary reports to decision makers, rather than just single point estimates of expected values. Decision makers need to understand that there are ranges of potential outcomes, and hence to judge the capacity of proposals to withstand future uncertainty.

CONSIDERING UNVALUED COSTS AND BENEFITS

Costs and benefits that have not been valued should also be appraised; they should not be ignored simply because they cannot easily be valued. All costs and benefits must therefore be clearly described in an appraisal, and should be quantified where this is possible and meaningful.

Research may need to be undertaken to determine the best unit of measurement. Alternative non-monetary measures might be considered most appropriate (See Box 17). For example, one of the benefits arising from a transport improvement is likely to be ‘time saved’. These savings must be measured before attaching an aggregate monetary value. In many cases, more than one measure will need to be included to capture the different impacts of the proposal, and the different dimensions of those impacts. For example, there are a number of quantitative indices based on loudness, duration and variability of noise levels.Valuation techniques for use in these circumstances and examples of their application are set out in Annex 2.13

THE PREFERRED OPTION

The outcomes from this section of OBC are crucial to the overall OBC. This section pulls together the outcomes from the considerable analysis of options and testing of risk and sensitivity.

This section should include a clear & concise summary of the option identified to be recommended for adoption. There should be a clear demonstration that the choice is based on the analysis undertaken and that represents the best value for money. That does not mean the cheapest but that which provides the best balance of costs, benefits and risks. The rationale for the choice of the preferred option should be explicit.

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The rationale for decision i.e. the relative position of costs, benefits, risks must be made clear. Where there were potential variants of the preferred option identified these should have been assessed as part of the option appraisal. It is therefore essential that the sole preferred option is clear as it is this option for which approval is sought and if appropriate, granted by the NHS Board and CIG

The preferred option is identified from a detailed analysis carried out. Stakeholder support is crucial in taking forward a preferred option through procurement and implementation. This section should detail how stakeholder support has been demonstrated for the preferred option and how stakeholder involvement will be maintained over the remaining part of the project lifecycle.

Whilst project management issues are considered specifically in the next stage of the OBC, the preferred option has to be deliverable. The key risks for the preferred option will have been considered in the option appraisal. This section should now take forward and detail how those risks affecting deliverability are to be handled and mitigated where possible. There needs to be adequate demonstration that the implementation of the preferred option will be adequately resourced and that proposed timescales are reasonable and achievable.

Business Case Stage 9 Assess Suitability for PPP

At OBC stage there is no presumption made by CIG regarding the funding route for a scheme following OBC approval. That said, the test at this point in the process is whether certain procurement routes are ruled out without further analysis.

The suitability of the scheme for PPP should be fully explored using the methodology below. Whilst this is not a precise methodology, the key factors to be assessed in a PPP

[insert guide to PFI assessment tool, refer to annex and inclusion of completed PFI assessment as annex within OBC NOTE:meeting on sept 10th to discuss this]

a preliminary risk allocation matrix indicating the likely risk allocation and contractual arrangements between the Trust and private sector (it is recognised that this will be subject to change during the course of negotiations and bidding. However, this issue should be considered before finalising tender documents and entering negotiations;*[Note: transfer of risk will not apply if PPP/PFI has been ruled out at this stage]*

11.2 identification of potential mechanisms for transferring risk to the private sector. *[Note: transfer of risk will not apply if PPP/PFI has been ruled out at this stage]*

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Business Case Stage 10 Operational Issues

Personnel Issues

[SECTION REQUIRED FROM HR ON REQUIREMENTS]
Present position, workforce planning, change management

Policy on Openness – consultation and involvement

SE/STUC Protocol

Technology Plan

[C KNOX INPUT TO WHAT THE OBC SHOULD BE COVERING RE TECHNOLOGY]

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Business Case Stage 11 Project Planning Arrangements

14. Timetable

14.1 summary of the project plan from development of the OBC to completion of the project, including key milestones

15. Project Management

15.1 description of how the it is intended to manage the various phases of the project, including any updates since the Initial Agreement. This should cover the composition and responsibilities of the project team and evidence of their capacity to achieve the various milestones, evidence of purchaser and local stakeholder involvement, specific role of external advisers, and estimate of costs which will be incurred during the procurement process

Business Case Stage 12 Presentation & Approval of Outline Business Case

Approvals Process (Board, Regional, CIG)

Approval and publication

2.7 Current arrangements are that all Business Cases (and Addendum where the procurement is done through PFI) and the contract must be made publicly available within a month of approval being given by CIG or financial close. This is discussed further in Chapter 9 under "Openness and Public Involvement". **(LINK?)**

Movement in Cost and the Approvals Process

The rules governing OBC reapproval are as follows:

For schemes in excess of £5m if changes to the scheme add up to more than 10% of the capital value, or 5% revenue value, reapproval should be sought. This figure *excludes* building and other inflation, and required changes that are outside the control of the NHS Body. All other changes should be included in the calculation. At FBC it will be helpful, alongside the audit trail of cost changes since OBC, to be clear what is the type of cost change, ie inflation, external change, or NHS Body ChangeTrust change.

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FULL BUSINESS CASE

Business Case Stage 11 Develop Preferred Option

Business Case Stage 12 Select a Preferred Private Option

Business Case Stage 13 Compare Public and Private Options

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Business Case Stage 14 Approval of Full Business Case

Business Case Stage 15 Full Business Case (Addendum) PFI/PPP Only

STANDARD BUSINESS CASE

STANDARD BUSINESS CASE

PURPOSE

1. The Standard Business Case (SBC) has been established as a mechanism for projects with a capital value below £5m that replaces the Initial Agreement, Outline and Full Business Cases. In the case of PFI/ PPP schemes the SBC has to be followed up with a Full Business Case and FBC Addendum for NHS Body audit purposes.

2. Whilst the SBC streamlines the approval process for schemes with a smaller capital value, it is not a vehicle that allows investment decisions to be taken without due rigour and assessment of possible options. The SBC must demonstrate that the proposed course of action is sound, meets strategic and operational objectives, is affordable and demonstrates value for money.

3. For those schemes covered by SBC's the NHS Body must be able to satisfy itself and the Department that capital resources (and the revenue consequences) are properly directed and that schemes are developed and delivered in accordance with best practice and extant guidance.

4. **The SBC process is MANDATORY FOR:**

- For NHS Body projects (other than IM&T) with a capital cost of less than £5m (inclusive of VAT);
- For NHS Trust and NHS Board IM&T projects with a project life cost over the first 4 years of the project (or the project life, if shorter) of less than £1m (inclusive of VAT); and
- For Special Health Board IM&T projects with a project life cost less than the current OJEC threshold for advertising (approximately £100k).

SBC APPROVAL PROCESS

5. For those projects covered by the SBC process, approval will be required NHS Body level prior to submission to SEHD. The SBC must be signed off by the NHS Board or Special Health Board Chief Executive.

6. The Capital Investment Group will continue to approve schemes in excess of established delegated limits for NHS Bodies until such time as increased delegation is granted by SEHD in accordance with the terms of HDL (2002)87 [link].

7. Following the granting of full delegation to a Health Board, all SBC's approved by the Health Board will continue to be submitted to the Private Finance and Capital Unit within SEHD for information only. A sample of such SBC's will be assessed by CIG members for compliance with guidelines and feedback provided to the appropriate Boards. It is intended that examples of good practice will be placed on the PFCU website in order to assist in promoting best practice. [link to examples page]

CONTENT OF THE SBC

8. [Attached is a basic template for the SBC that sets out the minimum content required. All Boards must ensure that these minimum requirements are met prior to sign off and submission to the Department].

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MINIMUM CONTENT REQUIREMENT FOR SBC

The Standard Business Case should contain the following information as a minimum:

1. The title of the project

- As it appears in the Board's Capital Plan and as it will appear in the reporting system.

2. Executive Summary

- One page summary of subject, scope, methods of analysis, major results (financial and other) and recommendations

3. **Introduction/Background**

- Strategic & Operational Objectives
- How the project links to Local Health Plan and Property Strategy
- Overview of process/ progress to date
- Proposed Outcomes – benefits to stakeholders

4. Description of the service concerned.

- Current Service and justification for change
- Proposed Service: benefits sought

5. List of options

- List of possible options to meet requirements
- Methodology for option analysis and selection of preferred option
- Statement that the appraisal of a full range of options has been considered and evaluated following the guidance in SCIM, considering costs, benefits and risks;
- Details of stakeholder involvement
- A table summarising NPV scores for options and benefits scores/ ranking
- Reasons for choosing the preferred option
- A table stating key assumptions (financial, demand, staffing, technology etc.)

6. Preferred Option

a) General Information

- A brief narrative describing the preferred option,

b) Funding Requirement (Capital and Revenue)

- The capital and revenue costs of the proposed option with appropriate phasing
- The sources and base of cost data presented
- The potential for procuring the project with PPP/PFI should be fully explored. Where PFI/PPP is not to be pursued there should be a justification for this decision based on factors

considered in "*HDL (2002) 87 Interim Capital Guidance Appendix B – Factors In Assessing PPP/PFI Potential"*

- **A statement that the project is affordable within the overall financial plan and that the Trust and Health Board in agreeing the SBC are agreeing to commit identified resources to the project. Reference should be made to specific meetings at which approval was given.**
- **A statement that options explored all opportunities for joint working with other agencies.**

7. Project Planning and Management

The SBC must contain:

- a plan with responsibilities and milestone targets for implementing, managing and evaluating the project including a timetable for the delivery and evaluation.
- an identified project team and lead project director
- any employed advisors and their role
- **an undertaking to complete post project evaluation together with arrangements for reporting to both the NHS Board (or one of its committees) and SEHD.**
- **A completed Project Profile Model (PPM) Gateway Review Risk assessment**

8. Regional Services/ Joint Working

Where the SBC is concerned with the development of services for the benefit of more than one NHS Organisation or other public agencies the SBC must contain statements detailing the extent and support of such agencies to the financial and service consequences of the project(s).

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9. THE APPRAISAL PROCESS

Appendices

Cost analysis/assumptions

B. Benefits Matrix

C. Benefits Analysis

D. Risk Analysis

E. Risk Assessment Matrix

F. Affordability Model

G. PFI suitability matrix (Analysis Report)

H. Maps/diagrams/drawings

I. Draft OJEC Advertisement
[Note: not applicable if PPP/PFI has been ruled out at this stage]

The OBC should contain specific statements to confirm that:

a) the development fits with the Local Health Plan and the objectives of the Board;

b) an appraisal of a full range of options has been considered and evaluated following the guidance in SCIM, considering costs, benefits and risks;

c) the OBC has been approved by the NHS Board or Special Health Board and that any resulting revenue consequences have been agreed;

d) private finance has been adequately explored – if a private finance route is not to be followed, then the reasons why, should be outlined;

e) a plan for implementing and evaluating the project has been drawn up;

f) it is consistent with the Property Strategy, if appropriate; and

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g) having regard for the service objectives of the proposal no better use could be made of the existing estate.

The OBC should be signed off by the NHS Board or Special Health Board Chief Executive.

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FULL BUSINESS CASE (FBC)

1.1.1.1.1.1.1 PURPOSE

The FBC explains how the preferred option, identified in the OBC, would be implemented and how it can be best delivered. The preferred option is developed to ensure that best value for money for the public purse is secured. If the preferred procurement route is through PPP/PFI, the preferred option is refined to produce a robust public sector comparator (PSC) which is used as a comparison against the best PFI option. Project management arrangements and post project evaluation and benefits monitoring are also addressed in the FBC.

MANDATORY FOR:

- For all PPP/PFI projects irrespective of value. For projects outwith the capital limits described in the next 4 bullet points, the FBC need not be submitted to SEHD;
- For NHS Trust and NHS Board projects (other than IM&T) with a capital cost of £5m (inclusive of VAT) or greater;
- For NHS Trust and NHS Board IM&T projects with a project life cost over the first 4 years of the project (or the project life, if shorter) greater than £1m (inclusive of VAT);
- For Special Health Board projects (other than IM&T) with a capital cost of £0.5m (inclusive of VAT) or greater; and
- For Special Health Board IM&T projects with a project life cost greater than the current OJEC threshold for advertising (approximately £100k).

CONTENTS

The FBC should contain the following information:

2.2 Description of the strategic context of the proposal.
2.3 Review of key assumptions underlying the strategic analysis and effects of any changes since the OBC was approved.

2.4 Description of present catchment population and present level of service activity.

2.5 Description of the size and scope of the project.

2.6 Justification of the assessment of future delivery of services, projected catchment population and other factors influencing the demand for services.

Strategic Context Text from FMA

The health body should ensure that the strategic context within which the FBC is set flows from the context originally established at the AI and OBC stages. Doing so will ensure that the capital investment is consistent with the objectives of the health body and a seamless transition in the process has occurred. Therefore in setting the strategic context in which the chosen option is to be developed, the health body should ensure that they provide the following information:

Description of the NHS Trust, NHS Board or Special Health Board and a statement of the objectives of the NHS Body and the project, and how the chosen option will deliver the need for change.

Description of the chosen option and where its sits within the strategic context of the health body as a whole, this will follow on from the context under which the IA and OBC were considered.

Review of key assumptions underlying the strategic analysis and effects of any changes since the OBC was approved.

Description of present catchment population and present level of service activity.

Description of the size and scope of the chosen option and how it fits into the Health Plan [link to website for the LHP] and the strategic direction and business objectives of the health body. With an overview of the health strategy for the area, drawing on the Local Health Plan. The impact of relevant local and national reviews which have a bearing on where and how different types of services should be provided should also be considered in relation to the chosen option.

The current activities of the health body and the range and quantity of health care services it provides; and how the chosen option will sit within the current and future service provision. An overview of the justification of the assessment in relation to the future delivery of services, projected catchment population and other factors influencing the demand for services such as changes in medical technology in relation to the chosen option should be detailed. The health body should clearly state whether it has the ability to meet these demands.

An assessment of the health bodies current financial position and cost structures and the acknowledgement that the chosen option is included within the strategic financial plans [link to website for the strategic planning] produced by the health body.

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The health body should set out an assessment of resources in terms of assets and manpower, and their current utilisation in service provision (including their functional suitability);

Assessment of the current service performance relative to the health bodies requirements (e.g. in the case of acute healthcare the project patient activity for each of the main specialities and services, proportion of treatments conducted as day cases by speciality, length of stay for in-patients, turnover interval by speciality and other relevant performance indicators). This should also cover cost per case data;

Assessment of any changes in the pattern of services needed to meet health bodies requirements and future demand (including the rationale for any changes to the current configuration of services or estate). The health body must therefore detail that the chosen option forms part of the coherent local strategic service strategy and provides a configuration of services which are sustainable in the long term.

Description of the Trust's strategy for meeting the service requirements, including how the chosen option will meet those requirements and its impact on other NHS Board areas served by the health body;

Checkpoints:

1. Is the capital investment consistent with the overall strategic objectives of the health body as detailed within the Initial Agreement and the Outline Business Case?
2. Has the strategic need for change been detailed?
3. Have the key assumptions contained within the development of the I.A. and the OBC changed in relation to the chosen option?
4. If so, has the health body detailed the changed in the key assumptions?
5. Have the strategic objectives/clinical need and outcomes in which the project sits been linked to the Local Health Plan?
6. Have the strategic objectives/clinical need and outcomes in which the project sits been linked to the Property/IT strategy?
7. With the clinical need for the project being established at both the I.A. and OBC stages does the chosen option sit within the strategic?
8. Has a description of the health body area, catchment area and population been provided?
9. Has the Local Health Plan, the strategic direction and business objectives of the health body been detailed in relation to the chosen option?
10. Has an overview of the health strategy for the whole health body area been included detailing how the chosen option fits within the parameters?
11. Has the health body detailed the impact of relevant local and national reviews which might have a bearing on where and how different types of services are to be provided, and specifically whether there will be any impact from or to the chosen option?
12. Have the current activities and the range and quantity of healthcare services been detailed and how the project and chosen option will affect them?
13. Has the impact of the project and the chosen option on current and future services provision been detailed?
14. Does the project and costing of the chosen option appear within the health bodies strategic financial plans?
15. Has the health body assessed and detailed the current assets and manpower and how they will be affected by the chosen option?

16. Has the health body conducted an assessment of current service performance against requirements?
17. Does the project, and therefore the chosen option, form part of a coherent local strategic services strategy, which will be sustainable in the long term?
18. Has the health body detailed the description of the service requirements, including how the project and chosen option will meet those requirements?

3. The Outline Business Case

3.1 A short summary of the OBC including a description of the long list of options.

3.2 Description of short list of options considered including results of the economic appraisal, benefits analysis, financial appraisal and sensitivity analysis.

3.3 Review of assumptions underlying the OBC to demonstrate how any changes have affected the ranking of options, including any changes to the assessed benefits of the scheme.

4. The Preferred Solution

Guidance given in this step concentrates on the process of developing the Preferred Option identified at OBC stage. The business case must now be reviewed to update the information provided on the Preferred Option in the OBC. For example:

Need: have there been any changes to the Trust's market position, Strategic Direction or supporting business strategies (service, estate, financial, human resource or information strategies) that affect the need for, or content of, the scheme?

Functional content: have there been any changes to the functional content that would affect the capital or running costs of the scheme?

Affordability: have there been any changes to the Trust's financial position that are significant enough to question the scheme's affordability?

Commitment of purchasers: have there been any changes to the commitment of purchasers (including those resulting from organisational change) that might affect the viability or affordability of the scheme?

Timetable: have there been any changes to the planned start and completion date?

Should the situation have changed in any significant way, there may be a need to look again at the OBC to ensure that conclusions are still valid.

Information contained in the Management of Construction Projects booklet provides more details on this stage with regard to projects involving a buildings element. [is this still relevant?]

Refining the Financial Factors

In addition to updating information which may have changed since OBC stage, it is crucial that a more detailed assessment of the costs of the preferred option must be undertaken at this stage. The cost of the scheme assessed will be the cost on which annual EFLs are finally established. If the

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public funded option is taken forward, NHS Public Bodies will have to ensure that the risk and uncertainty analysis undertaken as part of the business case is used to estimate the level of contingency required. They must also identify the capital and running cost variations that would lead them to undertake an internal review of the business case. Variations in capital cost of more than 10% will lead to lapse of approval. In such circumstances, NHS Public Bodies should consult the ME.
[Finance - is this paragraph appropriate as drafted?]

Running Costs

The level of scrutiny applied to each cost element of the preferred option should reflect the approximate cost of that element relative to the total cost of the option. Special care should be taken in applying this principle to running costs. In any one year, running costs may be only a fraction of the initial capital costs of a option. However, the implementation of a particular option may result in a commitment to a particular set of running costs for a 20-30 year period or longer. The present value of such costs may be far in excess of the present value of capital costs. Therefore, robust and well considered estimates for annual running costs should be of particular importance [FOOTNOTE: Costs incurred in the earlier years of a project's life need to be more accurate since they have more significance in a comparison of net present costs (for example, at a discount rate of 3.5%, the net present cost of amounts incurred in 20 years' time are discounted by around 50%, and in 50 years' time by 80%).].

Given the very high share of running costs in total costs for most projects, it is important that the review of costing should fully consider running costs. This is likely to entail:

- further detailed work on developing running cost estimates;
- corroboration of running cost estimates, by estimating costs using several methods and by wide consultation; and
- commissioning the preparation and costing of detailed designs for the preferred option.

Capital

Considerable work will have been put into the detail of the preferred option at the OBC stage, including completion of the capital costs summary forms. The Business Case Guide notes that variations in scheme content that result in an increase in cost of 5% or more, or variations in capital cost of more than 10%, or any changes that alter the ranking of the leading options, will result in automatic lapse of approval. [is this still relevant?] The costings should, therefore, be reasonably robust. Nevertheless, more detailed work may need to be undertaken to ensure the accuracy of the capital costs of the publicly funded option. For example, further work may suggest that the estimated on-costs may need to be revised or, if much time has elapsed, forecast building costs may need to be revised in the light of changes to construction cost indices.

It is important that all future costs over the expected NHS lifespan of the facility are included. Costs for refurbishment and adaptation up to the end of the time horizon should, therefore, be counted as part of the capital costs of the option.

Updating and Refining the Non-Financial Factors

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The assessment of the non-financial factors (or "benefits" for short) should follow that set out in the option appraisal in the OBC. The appraisal of the benefits should comprehensively cover all the key objectives and criteria and allow fine differentiation of the options. Objectives and criteria identified at previous stages in the project appraiasal should be confirmed, particularly in the light of views expressed by purchasers. Clearly the publicly funded option must meet all the minimum criteria and key objectives. The extent to which it will meet other desirable criteria (or "desiderata") should also be assessed. Although it may not be possible to measure the accuracy of non-financial factors in the same way as for the financial factors, nevertheless, a good degree of accuracy is needed.

Risk Analysis

~~[Daniel – this may be superceded by your section on risks]~~

Transfer of risk is a key issue in projects where private finance options are involved. This is an area where, in the past, some business cases have been weak, and is an issue that needs to be analysed in depth in business cases. A key source for assessing risks in planned projects will be information from other NHS projects that have been undertaken in similar areas or circumstances. That is why post-project evaluation reports are very useful as a learning tool for other parts of the NHS.

Optimism Bias

Evidence suggests that business cases typically include some level of appraisal optimism - that is, where the stated costs are based on an optimistic projection of outturns, or the benefits make unduly optimistic assumptions about achievement. The figures in the business case should not be based on best case assumptions but on more realistic expectations of outcomes. For example, the level of projected benefits might be based on unachievable realisation plans and the outcome may therefore be somewhat less than that projected. Or a capital cost expenditure forecast might have been put at, say, £10 million when in fact it may only have a 50% chance of turning out to be £10 million, but may also have a 50% chance of turning out to be £12 million. In this case the expected capital cost is actually £11 million, and the figure which should be entered in the cost projections would be £11 million not £10 million. Post-project evaluations are a useful source of information about typical overruns on costs and timescales, and the achievement of non-financial targets. It is particularly important to include a realistic assessment of costs and benefits, and not to base figures on an over-optimistic scenario ~~.~~(also see appendix X on Optimism Bias).

Variability

There will be a degree of variability around the expected values of costs and benefits. An assessment should be made of whether the variability is large or small. How accurate are the forecasts made? Are they, for example, accurate to within ±1%, ±5%, or ±10%? The greater the variability of the outcome, the more difficult it is to plan and budget, and the bigger the contingency sums that have to be set aside. In general, a smaller amount of variability is to be preferred to a greater amount. Variability can also be a problem in the achievement of non-financial factors. A more variable quality of service will require greater management effort to control. Drawing on past experience wherever possible, an assessment should be made of both the likely extent of variability and of the desirability of reducing variability.

Contingency planning

Sensitivity analysis is an area which is of key importance. A range of scenarios should be considered and "what if" assessments made. For example, what if purchasers decided to purchase less from the Trust? Or, what if new drug therapies reduced the need for hospitalisation of certain cases? Or, what if energy cost inflation doubled? "What if" scenario analysis should prompt testing of the robustness of the publicly funded option, and should highlight needs for contingency plans and risk management strategies.

Flexibility

~~[Daniel – also covered under risk?]~~

The degree of available flexibility should be assessed in the face of the likely range of possible scenarios. For example, to what extent could the Trust reduce costs in the face of falling demand? Or would it have the capacity to cope with increasing demand? If purchasers demanded much greater savings would there be the flexibility to make these? Or, if a greater proportion of cases needed to be dealt with as day cases, would there be the capacity to make the necessary changes? The availability of new options and flexibilities in the future may be of considerable value. An assessment should be made of the most valuable flexibilities which the NHS would desire, along with an assessment of the extent to which the Trust would be locked into certain costs, technological solutions, and methods of provision under the publicly funded option.

Incentives

The incentives and rewards facing the Trust under the publicly funded option should be considered. Typically, a Trust will face external pressures from its purchasers to make efficiency improvements and increase productivity each year. Within the Trust, too, there may be incentives to do better than expected in order to win a greater share of the NHS internal market. There may, therefore, be rewards and incentives for improving performance. Would there, though, be penalties for poor performance? An assessment should be made of the extent to which there are incentives to do better than central case assumptions, and penalties for performing less well than the central case assumptions. If such incentives are judged likely to be effective, their effects upon forecast performance should be reflected in expected outcomes.
[I assume this will have to be changed as the internal market is no longer relevant?]

Public Funding Availability

Projects may proceed from OBC approval without a promise of public funding being immediately available should a PFI approach prove not to be feasible. In cases such as these, the publicly funded option might have a later starting date than a PFI option. If so, the interim arrangements that would be put in place before the starting date should be included in the profile of costs, benefits and risks.

There may be certain types of investment where it may be inconceivable that the NHS would ever make public capital available. This may apply in the case of certain facilities which are not the core business of the NHS (e.g. provision of retail units). In these circumstances, where public investment is not an option, the public sector comparator would be the "do nothing" option. Value for money would be determined through competition from PFI bidders. Even though, in such cases, a publicly funded option would only be a hypothetical option, it may still be a useful discipline to estimate the costs, benefits and risks of a public sector comparator to be better informed when evaluating the PFI bids.
[Finance section?]

Results and Presentation

The key output of Developing the Preferred Option will be a description and costing of the preferred solution based on the most up-to-date assessment of the costs and benefits attributed to the project. The FBC will also be expected to include:

- An updated strategic context;
- Detailed assessment of capital costs;

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- Detailed assessment of running costs;
- Refined non-financial factor analysis;
- Risk assessment analysis.

The FBC will also be expected to include a timetable from FBC to contractual close and delivery of services. This should contain details of when the NHS Public Body expect to secure outstanding planning permission and details of what happens if planning permission is not achieved

Alongside the costings of the preferred option, the NHS Public Body should include details as to when the quoted price is firm until. [ASD are minded to remove this.]

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PPP/PFI	PUBLIC CAPITAL
4.1 Description of the consortium and its members, including an evaluation of their strength and qualities. This may include reports by a rating agency. 4.2 Description of the PPP/PFI solution. 4.3 Timetable for securing outstanding planning permission and details of what happens if planning permission is not achieved. 4.4 Timetable from FBC to financial close and delivery of services. 4.5 Details of when the price quoted in the PPP/PFI bid is firm until. 4.6 Details of the assumed interest rate on which the price of the scheme is based, including the interest rate buffer. 4.7 Sensitivity analysis of the effect on price of an increase or decrease in interest rates.	4.1 Description of the preferred solution. 4.2 Timetable for securing outstanding planning permission and details of what happens if planning permission is not achieved. 4.3 Timetable from FBC to contractual close and delivery of services. 4.4 Details of when the price quoted in the bid is firm until.

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5. The Public Sector Comparator (PPP/PFI only)

5.1 Description of how the PSC has been derived and updated from the preferred option in the OBC.

5.2 Explanation of any updates that have been made in order to place the PSC on the same basis as the PPP/PFI option.

6. The PPP/PFI Procurement Process (PPP/PFI only)

6.1 Description of the procurement methodology undertaken.

6.2 Details of advisers used by the Trust.

6.3 Description of the pre-qualification process indicating the route by which the Trust arrived at the short list.

6.4 Brief summary of the Invitation to Negotiate document including the evaluation process and criteria described for selecting a preferred bidder.

6.5 Explanation of the choice of preferred private sector partner.

6.6 A copy of the original OJEC advertisement should be annexed to the business case.

7. THE APPRAISAL PROCESS

7a Financial Appraisal (Affordability Analysis)

PPP/PFI	PUBLIC CAPITAL
7a.1 Quantification of the revenue implications of the scheme for the PSC, and the PPP/PFI option.	7a.1 Quantification of the revenue implications of the scheme for the preferred option.
7a.2 Analysis of the impact of the proposals on the NHS Body's operating cost statement, balance sheet and cash flow. This should highlight any peaks or troughs in individual years during the primary contract period.	7a.2 Analysis of the impact of the proposals on the NHS Body's operating cost statement, balance sheet and cash flow. This should highlight any peaks or troughs in individual years.
7a.3 Description of assumptions made for the financial appraisal, including an explanation of the methodology used to project both income and expenditure.	7a.3 Description of assumptions made for the financial appraisal, including an explanation of the methodology used to project both income and expenditure.
7a.4 Description of the NHS Body's income from other sources, e.g. ACTR.	7a.4 Description of NHS Body's income from other sources, e.g. ACTR.
7a.5 Position on VAT treatment of the project, including details of clearance from C&E.	7a.5 Position on VAT treatment of the project, including details of clearance from C&E.

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7a.6 Description of how land and buildings included in the PPP/PFI deal have been treated, and what assumptions have been made.	7a.6 Description of how land and buildings included have been treated, and what assumptions have been made.
7a.7 Details of and justification for the writing off of any of the NHS Body's debt and/or assets from existing use value to open market value and (where appropriate) from open market value to nil.	7a.7 Details of and justification for the writing off of any of the NHS Body's debt and/or assets from existing use value to open market value and (where appropriate) from open market value to nil.
7a.8 For building projects, FB 1-4 forms detailing capital costs must be included.	7a.8 For building projects, FB 1 – 4 forms detailing capital costs must be included.

7b Economic Appraisal (Value for Money Analysis)

At FBC stage, it is important to reassess the value-for-money analysis to ensure that the preferred option identified at OBC stage still represents best value for money for the public purse. The FBC economic appraisal should take advantage of any relevant information that has become available since the OBC stage. It is also important that the economic appraisal should include details of the do-minimum option in order that the comparative vfm of the preferred option can be demonstrated.

As with the economic appraisal carried out at OBC stage, it is important to ensure that the economic appraisal is based on reliable and robust information and that the results of the economic appraisal and the assumptions underlying those results are clearly presented. The OBC section of this Business Case Guide introduced The Department of Health Generic Economic Model (GEM). This model was presented as a useful aid to support the calculation and presentation of the economic appraisal at OBC stage. As noted previously, the model also has an FBC version, which is aimed at NHS bodies responsible for preparing FBC reports. The GEM should help simplify the process of preparing the economic appraisal for the FBC and promote a consistent format for the presentation of the results.

Section 4 above sets out how the preferred solution should be refined at FBC stage. Updated data on the cost of the preferred option should be reflected in the economic appraisal.

For the FBC stage of the Model, a user guide to the model and a set of economic principles to be followed in preparing the FBC are available in addition to the model itself [footnote – reference]. The economic principles covered in the GEM guidance are considered to be a central part of the economic appraisal process and relevant to all business cases to which the SCIM applies. To avoid duplication, these principles are not repeated in full here. However, the following principles are highlighted here as having particular importance to the economic appraisal at FBC stage:

- The economic appraisal should include details of the do-minimum option in order that the comparative vfm of the preferred option can be demonstrated;
- The concept of 'opportunity cost' is critical to economic appraisal. The cost of resources used in each option should reflect the value of those resources in their alternative, next best use. Market prices usually reflect the best alternative use that goods or services could be put to;
- Certain costs do not represent a resource cost to the economy as a whole. An example is tax - taxes are transfer payments between one part of the economy and another. Government

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guidance on investment appraisal states that the best approach in investment appraisal is to exclude taxes, e.g. VAT from all the options being compared. However, if the taxes on all of the options are the same, then their exclusion from the appraisal will make no difference to the ranking of options. In such cases, where exclusion would entail a great deal more work, this step can be omitted;

- Similarly, capital charges should be excluded as the discounting technique contained in the GEM allows for the true capital costs of options considered;

- Certain costs, though, may not fall on the budgets of any of the parties involved in the transaction, but may nevertheless represent real resource costs to those who do have to bear them. Any such external costs should be included where they may differ across the options. An example might be patients' travel costs if locations for services were to differ;

~~[Daniel – this may duplicate whatever you put in the benefits section?]~~

- Consideration should also be given to environmental factors such as emissions, clinical waste volumes, as applicable

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Non-Quantified Costs and Benefits

A description of the non-quantified costs of benefits in the scheme is required. More detail on this, including the use of weighting and scoring analysis were appropriate, is given ~~in section x~~ in section X~~below.~~

~~xxx~~

Discounting

Discounting future cashflows is a key aspect of the economic appraisal and subject to specific guidance issued by the Treasury and adopted by the Scottish Executive Health Department. The concept of discounting is covered in some detail in the OBS stage of this business case guide. The GEM also provides further guidance on the theory and application of discounting techniques. However, it is important to note that, in accordance with chapter 5 of the current Green Book [footnote], the recommended discount rate for cashflows up to 30 years into the future is 3.5%. For projects with very long-term impacts, over thirty years, a declining schedule of discount rates should be used rather than the standard discount rate. More detail on discount rates is contained in appendix x.

Risk and Uncertainty in the Economic Appraisal

The Generic Economic Model facilitates the presentation of risk adjustments and vfm. However, the model does not include a facility for the calculation of risk adjustments and the appropriate risk adjustments to be input into the model must be calculated separately. Guidance on the consideration and presentation of risk in the FBC is set out in detail in section x below and the GEM guide to the Excel Model provides guidance as to how risk adjustments can be input into the Model. Also see 'Private Finance and Investment – Changes to the Treasury's "Green Book" for further details on changes to the Green Book. [Link to document]

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Results and Presentation

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At FBC stage, the output of the economic appraisal will be represented by a series of NPC or EAC calculations, one for each option. Separate sets of results should be included for the NPC/EAC both with and without allowance for risk adjustments. This is an additional requirement in comparison with the OBC stage, where the presentation of risk-adjusted NPC/EACs is optional. The option that generates the lowest NPC/EAC is the best value-for-money option and represents the preferred option on economic grounds. The GEM facilitates the presentation and interpretation of NPC/EAC findings.

[FOOTNOTE: Equivalent Annual Cost calculations are a useful indicator of the relative value of different options where options have different lifetimes.]

As well as presenting the results of the NPC calculation, it is important that the key assumptions underlying the assessment of costs, benefits and risks in the economic appraisal are set out in some detail in the FBC.

The FBC should include an explanation of the reasoning why the preferred option represents best value for money.

PPP/PFI	PUBLIC CAPITAL

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7b.1 Net present value (NPV) comparison of the PSC, and the PPP/PFI option. If the different options have different life spans then the equivalent annual cost (EAC) of the options should be shown. The risk adjusted NPVs or EACs should also be shown separately. It may also be appropriate to include details of the do-minimum option from the OBC for comparative purposes.	7b.1 Net present value (NPV) comparison of the preferred option, and the other options. If the different options have different life spans then the equivalent annual cost (EAC) of the options should be shown. The risk adjusted NPVs or EACs should also be shown separately. It may also be appropriate to include details of the do-minimum option from the OBC for comparative purposes.
7b.2 An explanation of the reasoning why the preferred option is better value for money.	7b.2 An explanation of the reasoning why the preferred option is best value for money.
7b.3 Description of assumptions made for the economic appraisal.	7b.3 Description of assumptions made for the economic appraisal.
7b.4 Details of how the PSC was calculated, including updated information from the OBC on how the capital expenditure schedules, lifecycle costs and other operating costs were calculated. Consideration should also be given to environmental factors such as emissions, clinical waste volumes, as applicable.	7b.4 Details of how the preferred option was calculated, including updated information on the do-minimum option (for comparison purposes) from the OBC on how the capital expenditure schedules, lifecycle costs and other operating costs were calculated. Consideration should also be given to environmental factors such as emissions, clinical waste volumes, as applicable.
7b.5 Description of the quantification of costs and benefits included in the appraisal.	7b.5 Description of the quantification of costs and benefits included in the appraisal.
7b.6 Description of the non-quantified costs or benefits in the scheme, including a weighting and scoring analysis where appropriate.	7b.6 Description of the non-quantified costs of benefits in the scheme, including a weighting and scoring analysis were appropriate.
7b.7 Sensitivity analysis, and scenario modelling of the key assumptions behind the economic appraisal.	7b.7 Sensitivity analysis, and scenario modelling of the key assumptions behind the economic appraisal.

7c. Risk Analysis

PPP/PFI	PUBLIC CAPITAL

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7c.1 A risk allocation matrix showing which party is responsible for managing which risk. The risk matrix should reconcile back to the relevant paragraphs of the project agreement. 7c.2 A list of the key individual risks including an explanation of what each one means, and how the values and probabilities of those risks occurring were determined. 7c.3 An NPV analysis of the risks retained by the public sector under each of the options considered. This should be based on a probability analysis of the quantifiable risks. 7c.4 An assessment of the total risks associated with the project including those risks which are non-quantifiable in the form of a weighting and scoring matrix. 7c.5 Sensitivity analysis of the key assumptions underlying the risk analysis. 7c.6 Sensitivity analysis on the impact of other purchasers altering purchasing behaviour	7c.1 A list of the key individual risks including an explanation of what each one means, and how the values and probabilities of those risks occurring were determined. 7c.2 An NPV analysis of the risks under each of the options considered. This should be based on a probability analysis of the quantifiable risks. 7c.3 An assessment of the total risks associated with the project including those risks which are non-quantifiable in the form of a weighting and scoring matrix. 7c.4 Sensitivity analysis of the key assumptions underlying the risk analysis. 7c.5 Sensitivity analysis on the impact of other purchasers altering purchasing behaviour.

1.1.1.1.1.1.1.1.1 8 Summary of the contract structure

8.1 Description of the contractual framework of the project.

8.2 A diagram of the legal relationships between the various parties to the deal.

8.3 Summary of the main provisions of the contract agreement, the position reached on the key issues (detailed further in Annex A) and any points that are outstanding.

9. Accounting Treatment (PPP/PFI and Leasing only)

9.1 An assessment of the proposed accounting treatment of the project in respect of the NHS Body's balance sheet by the Director of Finance, backed up by appropriate professional advice. It is expected that projects will be likely to be off-balance sheet. This should include a summary of the rationale and key elements underlying the off-balance sheet accounting opinion. (See Treasury Taskforce Guidance Note No. 'How to Account for PFI Transactions' – or subsequent guidance).,

9.2 There must be a written indication from the Trust's external auditors that they have no objection to the proposed accounting treatment of the project. (See Note for Guidance 96/6 published by the Accounts Commission or any subsequent Note for Guidance published by Audit Scotland.)

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9.3 SEHD should be notified as soon as possible if it is likely that a scheme will be on balance sheet. The NHS Board will also need to consider how it can cover the on balance sheet project from its capital provision.

10. Project Management Arrangements

10.1 Description of the project management and control arrangements both throughout the construction and the operation phases of the project.

11. Benefits Assessment and Benefits Realisation Plan

PPP/PFI	PUBLIC CAPITAL
11.1 Description of the benefits to be delivered under the project, including an indication of differences in the levels of benefits delivered under the PSC and the PPP/PFI options.	11.1 Description of the benefits to be delivered under the project.
11.2 A thorough and complete benefits realisation plan.	11.2 A thorough and complete benefit realisation plan.

12. Risk Management Strategy

12.1 Details of plans for managing risks which might arise during the implementation of the project. This will cover all potential risks retained by the public sector.

13. Post Project Evaluation Plan

13.1 A plan for monitoring the progress and completion of the project, and for evaluating the outcome following implementation is essential and should be carefully prepared and implemented.

14. Information Management and Technology Strategy

14.1 A description of the trusts IM&T Strategy and how it relates to the project under consideration.

14.2 If a major redevelopment does not include a specific IM&T component, an outline of how the IM&T strategy will be delivered including any affordability implications.

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15. Equipment

PPP/PFI	PUBLIC CAPITAL
15.1 An explanation of how equipment will be provided for the project, and what equipment is in the PPP/PFI contract.	15.1 An explanation of how equipment will be provided for the project, and what equipment will be leased.
15.2 A summary of how equipment within the PPP/PFI contract is handled.	15.2 A summary of how equipment within any lease contract is handled.
15.3 Details of how equipment not in the PPP/PFI contract will be provided. 15.4	15.3 Details of how equipment not in a lease contract will be paid for.

16 Personnel Issues

16.1 If the project involves any significant changes to the numbers and mix of staff employed, a human resource change management plan should be prepared, including redundancy costs, early retiral costs, etc.

17. Conclusion

17.1 A statement of the preferred option in the FBC for which approval is being sought.

The FBC should contain specific statements to confirm that:

a) the development fits with the Local Health Plan and, if appropriate, the Property Strategy and the objectives of the NHS Board;

b) having regard for the service objectives of the proposal no better use could be made of the existing Estate

The FBC should be signed off by the NHS Board or Special Health Board Chief Executive

Variations contemplated and/or brought forward during the construction phases of capital projects represent a considerable risk to the public sector because of their potential to delay the whole building timetable. In order to gain tighter control on the cost movement of capital schemes CIG approval will be required for variations above a certain threshold ('variations during construction … limited to the lower or 2% of projects capital costs or £2 million, whichever is lesser') NHS, and this has meant more and more variations are being brought to our attention. Trusts should note that variations should not be viewed as routine business but very much a last resort. One of the key benefits of PFI is that risk transfer to the private sector gives more certainty of price to the NHS: under PFI the design process is much further advanced than under normal procurement and all uncertainties should have been tied down by the time the banks lend the money to the project.

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GUIDANCE ON PFI FULL BUSINESS CASE APPROVAL FOR PFI SCHEMES

Version February 2004

Contents

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Appendices

FULL BUSINESS CASE (PPP/PFI)

Introduction

1. The aim of this guidance is to document the process and requirements necessary for the SEHD to be able to give FBC approval for PFI schemes and schemes which are partly financed with private funding. Reference should also be made to the Scottish Capital Investment Manual, PFI guidance supporting this procurement process.

2. **Delegated Limits for Approval**

3. All PPP/PFI schemes require SEHD approval.

Variations

7. Construction variations, (other than those arising from change of law) will be limited to the lower of 2% of the project's capital costs or £2m, whichever is lessor. Anything above this will require notification to be made to the PFCU detailing the reasons for movement and statements regarding the impact on affordability of the project.

Role of SEHD on schemes with a capital cost >£5m

8. For all schemes with a capital cost of >£5m, the SEHD should be involved throughout the procurement process. Involvement will be primarily conducted through the PFCU when required. Actual approval should therefore be an iterative process. The NHS Board should approve the final FBC *before* it is submitted to CIG together with the FBC checklist fully completed by both the Operating Division and the Board. Where NHS Boards do not have the expertise locally to complete the checklist, they will be expected to take advice as necessary to enable completion by themselves – for example from legal advisors. The NHS Board Chief Executive must sign the FBC checklist.

9. The roles of CIG will be to verify that the scheme meets the **parameters for approval:**

- Value for money
- Value for money of funding terms (including review of financial model)
- Value for money of any land
- Off balance sheet
- Affordability
- Appropriate NHS Board/ stakeholder support
- Acceptability of the Design Proposals ????????
- Contractual terms including acceptability of any proposed (non project specific) deviations from standard form
- Fair treatment of staff & application of the SE/ STUC protocol

10. In order to do this there should be a full review at CIG by a team including:

- Private Finance and Capital Unit
- Head of Property & Capital Planning
- Economic adviser
- Finance Manager
- Performance Manager
- Relevant policy interestsand

11. The role of each team member will depend to some extent on individual skills and expertise. However they are broadly as follows:

- It is the Finance Managers' role to project manage the approval process and to ensure that all the parameters of approval have been met, after taking account of the reviews of the other reviewers. This will usually involve providing feedback to the NHS Board on the various parameters of approval and ensuring that any issues raised are resolved satisfactorily. It will also involve a review of the FBC to

see if it is consistent with relevant policies. These policy areas are outlined in more detail in the FBC checklist.

- The Finance Manager should also ensure that supplementary information in support of the submission has been provided and is consistent with the submission – see section "Documentation to be submitted with the FBC". The Finance Manager should also ensure that the FBC checklist is completed satisfactorily. In other words, the NHS Board have confirmed that a matter has been dealt with in accordance with the FBC checklist. Or where there has been a departure form the commercial terms in the standard contract or FBC checklist, the NHS Board's justification of the departure is reasonable. In addition the PFCU should ensure that an audit trail of the approval process has been kept on the project data spreadsheet.

- The PFCU should check if the OGC Gateway Risk Potential Assessment (RPA) (which enables the level of risk associated with a project to be assessed) has been completed, the project's risk score is disclosed. For high risk projects, as defined by the use of the OGC Gateway RPA, the PFCU will check that the appropriate OGC Gateway Review has been undertaken and the key recommendations contained in the review report are being addressed.

- The PFCU is also responsible for securing where necessary a letter of comfort, EFDA certificate and appropriate lease/ licence assignation.

- The PFCU will be able to offer advice on the commercial terms, payment mechanism, financial model and value for money of the financing.

- The **PFCU** review will focus on human resource issues, project specific legal issues and any departures from the standard contract terms including the payment mechanism. Departures from the standard form should be the exception and limited to project specific areas. Please note that the extant version of the Scottish Executive Health Department Project Agreement should now be used and is on the PFCU web site [link].

- The **economic adviser** will cover the economic analysis including value for money, generic economic model, and risk analysis, post project evaluation arrangements and benefits realisation plan. The revised Green Book guidance came into full effect from 1 April 2003 – this incorporates changes such the 3.5% discount rate and optimism bias.

- Should we specify the property input/ Develop this role?????

- The reviewers should provide the appropriate Finance Manager with written confirmation that all approval issues have been cleared. If there are any unusual aspects to the scheme, the review should explain why they are considered acceptable or otherwise.

- A list of contacts at the SEHD is available at [LINK TO CONTACTS PAGE].

Audit Trail

12. All key correspondence should be filed as a matter of course. A final copy of the FBC, project agreement, financial model as at financial close and final payment mechanism should be obtained and filed electronically. The audit trail should include the following as a minimum:

- Documentation submitted with the FBC (see Section 2)
- Submission to SEHD/ Ministers and internal minutes confirming their approval
- SEHD review of the FBC
- Externally Financed Development Agreement/ Letter of Comfort/ Lease assignation/ Transfer Orders

NHS Board Approval

General

13. The NHS Board must check that the parameters of approval are met, prior to FBC submission to the SEHD and complete the FBC checklist and key facts sheet and submission confirming NHS Board approval to the SEHD Finance Manager leading the approval.

Strategic Case

14. The NHS Board should confirm in its submission, recommending approval, that the scheme forms a coherent part of the local health plan and provides a configuration of services that will be sustainable. Together, the NHS Board submission and completion of section 4 of the FBC checklist "Strategic Context" should provide sufficient confirmation of the appropriateness of the strategic context for the CIG to be content with the strategic case for the scheme.

Role of Estates Departments within NHS Boards

15. The NHS Board should ensure that their Estates departments have reviewed the design proposals regarding the following:

- Design quality of the proposed PFI design.
- The NHS Board has sign off design to the extent required by the Design Development Protocol. Please note that the DDP Steering Group is currently reviewing a Revised Version DDP II incorporating PITN changes.
- The NHS Board applied the AEDET design tool.
- Fire code.
- Statutory Compliance.
- Functionality, suitability and quality of the facility.
- Environmental standards including the Government's Green Agenda and that the NHS Board has carried out a NEAT analysis of environment and energy performance.
- Health Building Standards:
- Health Building Notes
- Health Technical Memoranda
- Construction Standards.
- Compliance with policy on single bedded rooms – 20% or more, and must be a higher percentage than existing facilities (50% being the ideal target).?????
- Fit with NHS Board overall Estates strategy.
- Build up of the Public Sector Comparator.
- Use of the new Healthcare Capital Investment department Cost Allowance Guide (Version 2 November 2001).
- Other issues e.g. security.

The NHS Board Estates Department should also review the following:

- Land and property issues.
- Construction of the Public Sector Comparator (FB forms, capital costs and BCIS).
- Planning status.

Generally the Estates Department will be responsible for highlighting deviations from guidance or best practice etc to the NHS Board. However the final responsibility regarding design functionality, functional relationships, the PSC should rest with the NHS Board Project Director. The SEHD economic adviser will also review the suitability of the PSC (see section on "VFM").

Timetable for FBC Approval

16. It is important that NHS Boards allow sufficient time for the FBC approval in the timetable to financial close. In general the NHS Boards should comply with the CIG approval timetable made available via

the PFCU website and ensure that FBC's are submitted no later than 4 weeks before the planned CIG meeting. Before submission of the FBC NHS Board approval must be sought. With agreement, where the NHS Board is due to meet to approve the FBC within the 4 week consideration period, written notification from the Chief Executive of the NHS Board that Board approval has been given prior to the CIG meeting date will allow the FBC to be fully considered and approved by CIG. The CIG will not consider FBC's prior to NHS Board approval.

17. The timing of the FBC submission should be made sufficiently close to financial close that the terms of the deal are sound and that contractual variations are kept to a minimum. Ideally this should be no more than 3 months in advance of financial close.

Due Diligence and timing of FBC Submission and Approval

18. It is expected that while the FBC is being considered for approval, the NHS Board and private sector will continue to finalise the contractual documentation and that due diligence on behalf of the financiers will continue. NHS Boards will be required to demonstrate that they are sufficiently close to financial close before FBC approval will be given. As a general policy it is preferable for the FBC approval to be as close to financial close as possible (two weeks is the norm). This means that due diligence must have started in advance of FBC submission. The reasons for this are two-fold:

- The NHS Board cannot put together a comprehensive FBC covering all commercial and contractual terms if they have yet to be finalised; and

- The FBC approval expires after three months. If the FBC is approved well in advance of financial close, the NHS Board may need to seek re-approval of the FBC. This could be either because the approval lapsed or the scheme has changed (for example, as a result of changes in interest rates or changes to commercial and contractual terms as a result of the passage of time).

- FBC approval will only be given if the designs are sufficiently advanced to the extent required by Design Development Protocol II. [SHOULD WE BE APPLYING THIS?????]

Documentation to be submitted with the FBC

19. The documentation to be submitted with the FBC should be up to date and consistent and should include the following:

- FBC checklist including the key facts – completed by Operating Division and NHS Board– see *Appendices 3 and 4.*

- NHS Board approval submission that summarises the key features of the scheme and makes the case for approval – see *Appendix 2.*

- FBC – this should reflect the latest contract and financial model. The layout of the FBC is really a matter for the NHS Board, however it is necessary that the level of information necessary to assess the scheme is included in the FBC. The relevant section of the Business Case Guide sets out the the requirements for the content of the FBC for PPP/ PFI schemes. The suggested format is easy to follow and the assessment process is made much simpler and quicker if the standard format is followed.

- The layout and content checklist [LINK] also provides a useful check for PFCU to decide whether all the information is available to make a decision whether to approve the FBC. The CIG requires requires eight copies of the FBC. These are for the Head of Property & Capital Planning, the Head of PFCU, the PFI Facilitator, the economic adviser, the Finance Manager and Performance Manager and 2 policy interests respectively. In dealing with queries from CIG any changes to the FBC should be made and the doicument finalised. This document should be the basis of FBC made publicly available. The NHS Board should provide PFCU with a copy of the final version in addition to the general requirements on openness detailed at [LINK TO OPENNES SECTION].

  [SPLIT OFF BELOW TO CONTENTS SECTION]

The FBC should include

- Latest draft project agreement and details of any deviations from the standard form contract. These must be limited to project specific issues and the Trust should justify why this is considered acceptable. This should include the payment mechanism, performance monitoring standards and output specifications.
- A copy of the consortium's financial model (hard and soft copy), which demonstrates how and what returns are made by the private sector – see *Appendix 6* for the minimum level of detail in the financial model.
- Other supporting documentation: this list is not exclusive but covers some of the key documents which should be included in the audit trail file:
- Letter of support from the othe NHS Boards party to the deal – confirming support for the scheme itself and affordability implications. Where there are large numbers of NHS Boards contributing to the costs of new/ enhanced services we expect that at least 80% by value sign up to the consequences of the unitary charge, including the host NHS Board.
- Electronic copy of the GEM.
- Letters from the NHS Board's external auditors, financial advisers and director of finance confirming that the scheme's balance sheet treatment is in accordance with the latest guidance. The financial adviser's analysis in support of this opinion should also be included.
- Report of the NHS Board's financial advisers confirming that the funding is value for money in the current market.
- DV valuations of any surplus land being sold to the consortium in return for a reduction in the unitary charge and evidence that VFM has been obtained in accordance with the extant guidance of "Land and Buildings in PFI schemes"{LINK to GUIDANCE]. The District Valuer's valuation should also cover estimates of any residual interest that will be capitalised by the NHS Board during the concession period.
- Evidence of outcome of consultation on service configuration.
- Evidence of stakeholder involvement (including Community Health Partnerships) in the strategic decision making process.
- Clearance from Customs and Excise re VAT recovery on unitary charge.
- Where a composite trader tax treatment is proposed a letter from Inland Revenue regarding the proposed PFI transaction under Inland Revenue Code of Practice 10 ("a COP 10 letter") indicating whether or not their activities are likely to qualify for composite trader tax treatment. Please note that this is not an irrevocable tax clearance, since the issue of whether a company qualifies, as a composite trader will depend on how it actually carries on its business in fact.
- Confirmation from the Inland Revenue/Customs and Excise re the tax treatment of any surplus land.
- Evidence that full planning permission has been obtained, that reserved matters have been satisfactorily dealt with and judicial review periods expired.
- Preferred bidder letter and details of key changes post selection
- Evidence of the NHS Board meeting (minutes) approving the FBC and giving authority to the NHS Board Chief Executive to sign the contract.

Section 2 – KEY PARAMETERS FOR APPROVAL

Approval Parameters

1. The key parameters of approval are as follows:

- Value for money
- Value for money of funding terms (including review of financial model)
- Value for money of any land
- Off balance sheet
- Affordable
- Commissioner support
- Acceptability of the design proposals
- Contract terms
- Acceptability of deviations from standard form
- Fair treatment of staff
- Payment mechanism – standard.

Value for Money of PFI Option compared with the PSC

2. The CIB lead is responsible for sending a full copy of the FBC, electronic copy of the GEM and any Appendices to the Economic Adviser in EOR to review. Any review queries and comments should be fed back to the Trust for answer in writing. The Economic Adviser will carry out a detailed review to ensure that the preferred option demonstrates the best value for money relative to the other short listed options and gives better non-financial benefits. The role of the Economic Adviser is to ensure that the methodology and underlying assumptions used to evaluate value for money are robust. However, once the Economic Adviser has confirmed that the economic appraisal is satisfactory, the CIB lead will need to be sufficiently familiar with the economic analysis to complete section 7 and 8 of the FBC checklist – value for money and risk.

3. The economic analysis in the FBC should conform to relevant guidelines. See the Capital Investment Manual, Green Book (2003 version applies to schemes that issue their ITN after April 2003) and chapters 2 “Risk analysis” & 3 “The Public Sector Comparator” of Section 3 of the “Public Private Partnerships in the NHS: The PFI” for further detail. Schemes beyond ITN at 1 April 2003 can use the discount rate of 6% rather than the new discount rate of 3.5%. The key economic issues examined by EOR are summarised below.

Public sector comparator

4. The public sector comparator must provide a robust comparator for the PFI option. It should be developed from the preferred option in the OBC. This should be updated from the OBC, to reflect current circumstances, but it should not be updated to mirror the PFI solution. The PSC should represent the public sector’s best method of delivering the Trust’s output requirements, with the assumptions based on recent evidence.

5. The analysis in the OBC should assume there is no evidence on the access to capital. Similarly, the PSC should not incorporate a capital constraint, and the implementation timetable should be the same as the PFI option.

Costing

6. The construction costs of the PSC should be based on Departmental Cost Allowance Guides (DCAGs). The estimate of construction inflation is made using the MIPS index. NHS Estates and Facilities Management Development Agency (NHS Estates) produce both of these measures. These costs will be summarised in the FB1 form. The FB1 costs included in the net present costs (NPCs) should not include `contingencies’, because this should be included in the risk analysis. And the only inflation that should be included in the NPCs is where MIPS are expected to be higher than general inflation (2.5%). Lifecycle and maintenance costs, and soft FM costs, for the PSC should be estimated using a `bottom-up’ approach. For large schemes, `rule of thumb’ costing (e.g. 2% of capital costs) is not

sufficient. The use of Departmental Cost Allowances is not sufficient for refurbished or constrained sites. It is a matter for the quantity surveyor appointed by the Trust to make appropriate adjustments in arriving at the cost of the Public Sector Comparator.

1. Risk

7. The Generic Economic Model must be used to complete the risk analysis. This can be found on the PFCUwebsite www.show.scot.nhs.uk/pfcu The risk analysis should include a list of all the risks considered with their expected values. Alongside this, the case should provide details of all the assumptions used in estimating the value of risks. A risk allocation matrix should be included in the FBC showing which parties are responsible for which risks. In addition, the following benchmarks should be provided for the PSC:

- **The planning, design, and construction risk as a proportion of the construction cost; and**
- The NPC of risk transfer as a proportion of the NPC of the unitary charge, where risk transfer is the difference in risk held by the Trust under the PFI option and the PSC.

1.1 Appraisal horizon

8. The primary comparison for value for money purposes is where both options are appraised over 60 years. In the period after the end of the contract, the PFI option should be appraised on the basis that the PFI contract is extended. The costs from the primary period will need to be adjusted to remove the cost of debt. Alternatively, the PFI option can assume that the public sector now provide the services, so they should be costed on this basis.

9. For the purposes of sensitivity analysis, the case should include NPCs and EACs for both options appraised over 60 years (including the build period), and over the period of the primary contract. See *Appendix 5* for further guidance on the appraisal period of PFI options.

2. Sensitivity analysis

10. The sensitivity analysis should examine the impact on the value for money of changing the key assumptions by either: (a) finding the value that changes the ranking of the options - the `switching value', or (b) changing the value to the extreme of plausibility, and assessing whether this changes the ranking.

11. As a minimum, this analysis should test the sensitivity of the following assumptions:

- The key cost assumptions; and
- Interest rates.

Value for Money of funding

12. In addition to the analysis of the VFM of the scheme as a whole compared with a public sector option, the assessment of the FBC should also cover the VFM of the funding arrangements. The consultant allocated to the scheme is usually best placed to advise on the value for money of the funding at the DOH level. The private sector will be required to renegotiate the funding terms where they are not considered acceptable.

13. In order to carry out the review, the CIB leads will need to ensure that consultant allocated to the scheme has both a soft and hard copy of the financial model for review. A protocol for the model review can be found at *Appendix 7*. A detailed checklist of the type of information that should be provided in the financial model is enclosed in *Appendix 6*.

14. The key requirement is that the Trust demonstrates VFM of funding in comparison with:

- alternative methods of financing
- In terms of the current market.

Where the scheme is an appropriate size EIB funding should be considered. The consortium should have held a funding competition for each type of debt.

15. A database of funding terms on approved schemes to date is now held centrally by CIB on the h/g: drive. This provides a useful tool for benchmarking the funding terms. The consultant should use this to review the funding terms and provide a written report confirming whether they are acceptable to the CIB lead. The consultant should complete the database for the funding terms on the scheme once it has reached financial close. The database has been circulated to SHAs, so they now have the tools to check the value for money of the funding arrangements prior to FBC submission.

16. In addition to the consultant's review, the *Trust's financial advisers* must provide written confirmation that the funding terms are value for money compared with alternative types of financing and in terms of the current market. In order to do this, the Trust's financial advisers may need access to funding negotiations.

17. The model should reflect the funding terms described in this letter. The following measures should be consistent with market norms:

- Project IRR/weighted average cost of capital
- Cost of senior debt
- Cost of bond finance
- Equity IRR
- Blended return from a package of equity and sub debt

The NHS Board's financial advisers should be satisfied with the build up of the unitary charge.

18. Please note that the CIB lead will need to be sufficiently familiar with the funding terms to complete section 12 of the PFI FBC checklist on financial issues, following the consultant's confirmation that the funding terms are acceptable.

19. There is no preference on the part of the public sector for any particular type of financing. There are both advantages and disadvantages to using bond or bank financing and these markets are changing all the time (e.g. bank margins have come down). Bond financing will usually be more appropriate for larger schemes. For these schemes, the FBC must demonstrate that the choice of funding (bond v bank finance) is value for money, and that the mix of funding and type of funding is VFM in the current market.

20. Senior debt is provided at variable rates (LIBOR – London Inter Bank Offer Rate) and the project company is usually required by the bank to buy an interest rate management tool (such as an interest rate swap) to fix the rate. The underlying rates of interest/swap rates should be up to date and there should be arrangements for benchmarking the swap rate at financial close. The VFM and affordability analysis should both be based on these up to date rates. It is important that there is sensitivity analysis of the effect of changes in interest rates on VFM and affordability.

21. DOH need to be satisfied that there is an optimum mix of funding between equity, subordinated debt, senior debt and bond finance. An optimum mix should minimise the weighted average cost of capital but still meet each party's objectives.

Review of the Financial Model

22. The FBC should contain the report of the NHS Board's Financial Adviser that must include a review the financial model

Value For Money of and Accounting for Land

23. The Finance Manager will need to be sufficiently familiar with the guidance on land and buildings in PFI deals to complete section 13 of the FBC checklist on land. The Finance Manager should be satisfied that the accounting treatment of land on which the new facility will be built is correct. Normally we would not check NHS Board accounting. However this issue is complex and has a significant impact on affordability. The Finance Manager should be satisfied that the residual forecast is supported by DV valuations. In rare instances where surplus land is included in a PFI scheme in exchange for a reduction in payments, the NHS Board should make sure that the scheme complies with the guidance on "Land and Buildings in PFI schemes" [LINK TO GUIDANCE]. Guidance covers both VFM and accounting treatment. This can be found on the PFCU website [link to guidance].

Affordability

24. The Finance Manager usually checks that the scheme is affordable and must complete section 10 of the FBC checklist on affordability. The FBC must include statements to the effect that the financial consequences are incorporated in the NHS Board's five-year financial plan. Affordability of the PFI scheme should be demonstrated over the life of the concession and not just one-year. However the assessment of affordability will also be linked with the financial advisers review of the financial model.

25. There should be explicit written support of the strategic aspects of the scheme and agreement from the Commissioner about any cost implications of the commitments required.

26. To allow for possible changes in interest rates that may lead to an increase in price up to financial close, the price of the scheme on which commissioner support is based should include an interest rate buffer. This buffer should be 0.25% above the relevant interest rate ruling at the time of FBC approval. The relevant interest rate is likely to be that used for the proposed hedging strategy. Any favourable movements in interest rates should be for the Trust's benefit. If rates rise above the interest rate buffer, approval may lapse if the scheme is no longer VFM or affordable.

27. Where a Trust has an Income and Expenditure deficit and has a planned recovery programme to reach financial balance, affordability must be demonstrated inclusive of the recovery plan. The SHA should confirm that the recovery plan is robust and agree to monitor the Trust's progress against agreed milestones and to take corrective action should any problems emerge. The SHA should be satisfied that the Trust could

    (a) Afford the contract year on year;

    (b) Continues to meet its financial duties.

28. Sensitivity analysis should be carried out on all key assumptions underlying the financial analysis. The FBC should focus on the variables that affect the affordability of the PFI scheme. As with the VFM analysis, these should be varied by an amount that reflects their uncertainty. The sensitivity analysis should include an assessment of the switching values or crossover point of crucial factors. Again the sensitivity analysis should always include an assessment of the effect of changes in interest rates. They should also include analysis of the impact of capital charges at 3.5% and of the impact of financial flows. See *Chapter 6 "Affordability and value for money" of Section 1 of "Public Private Partnerships in the NHS: The PFI"* for more detail.

Accounting Treatment

29. HMT Technical Note 1 (Revised) published in 1998 stated that: "The objective of PFI procurement is to provide high quality public services that represent value for money for the taxpayer. It is therefore value for money, and not the accounting treatment, which is the key determinent of whether a project should go ahead or not".

30. The FBC should set out the balance sheet treatment in accordance with HMT Technical Note 1 (Revised) and the FBC should include opinions as to the balance sheet treatment from:

- The NHS Board's External Auditor;
- NHS Board Director of Finance;
- NHS Board's financial advisers.

31. The affordability implications of the balance sheet treatment should also be clearly set out.

32. It is quite usual for the auditors to rely on the financial adviser's opinion. However it is the external auditor's and NHS Board Director of Finance's opinions which are crucial for the FBC approval. Usually balance sheet opinions have caveats to the effect that even small changes to the contract could affect the balance of risk transfer and the on / off opinion. It is therefore important that the balance sheet opinion is updated if there are any changes to the contract/structure of the project. NHS Board should allow sufficient time to do this as balance sheet opinions cannot be completed overnight. Often the audit opinion is out of date when submitted to CIG. It should be based on the same draft project agreement as the FBC. The NHS Board should check that the audit opinion is up to date prior to FBC submission. If the project agreement has not changed significantly since the audit opinion was written, it is acceptable for the auditor and financial adviser to confirm that the changes do not alter the balance sheet opinion rather than redo the opinion. However the original balance sheet letter and update should both be kept on file as evidence of the audit opinion.

33. The Finance Manager lead must complete section 10 of the FBC Checklist on "Accounting" following review of the accounting opinions.

Stakeholder Support and Strategic Context

34. The Finance Manager will check that the support of other contributing bodies is in place. The relevant body should confirm its written support for the scheme and funding consequences – see section on affordability.

35. The Performance Manager should also be satisfied that the FBC clearly sets out the impact of the scheme on relevant targets set by the SEHD.

36. The FBC should provide evidence that the facility to be provided is a function of appropriate bed and capacity modelling, in particular Local Health Plans and wider capacity plans.

Contract Terms

37. The FBC must contain a report by the NHS Board's legal advisers setting out the position with regard to compliance with the extant standard project agreement (and as part of that project agreement, the payment mechanism). The case made by the NHS Board for any variation to the standard project agreement should be clearly set out together with an impact assessment of the requested changes. As stated in other sections of this guidance the development of the contractual terms should be an iterative process and any proposed variation sought by the NHS Board to the standard project agreement should be discussed with the PFCU. Any approaches for such changes must be made by the Project Director of the NHS Board and not directly by the Board's legal advisers.

38. The legal review should focus on the acceptability of departures from the standard form contract.

39. The PFCU must complete sections 14 of the FBC Checklist following the lawyer's confirmation that the contract terms are acceptable.

Employment Issues

40. The PFCU and the SEHD HR Directorate will be able to advise on the employment issues as part of the overall legal review. The PFCU must complete section 5 of the FBC checklist on "Human Resources issues" following the lawyer's confirmation of the acceptability of the employment issues. Scottish Ministers will take a close interest in the employment issues so it is important that the FBC covers these issues fully.

41. The key points to check are as follows:

- SE/STUC Protocol provisions and technical guidance has been applied correctly if appropriate – to all non-managerial staff providing catering, domestics, laundry, portering – and security (where combined with portering). Inclusion of any other service must be approved by PFU.
- All transferring staff are covered by TUPE.
- All transferring NHS staff will be provided with a broadly comparable pension (not just at the first transfer but second and subsequent transfers).
- Must have a GAD certificate confirming that any staff who transferred their occupied pension rights to the new employers have these fully protected. If there is a bulk transfer the value transferred should be agreed by GAD prior to financial close (and preferably prior to selection of the preferred bidder.)
- NHS Boards must demonstrate they have involved their staff and Trade Unions in a process of continuous dialogue during the PFI procurement process as required under the terms of the SE/ STUC Protocol.
- The private sector agrees to observe its obligations under TUPE in respect of Trade Union recognition.
- No clinical staff transfer (except in special circumstances with PFCU prior involvement and Ministerial agreement).

43. See the PFCU website for the appropriate technical guidance on the application of the SE/ STUC Protocol and detailed guidance on the "Fair treatment of staff" within the PFI guidance in SCIM [INSERT LINK]

44. Only staff directly involved in running the building included in the scheme, such as maintenance staff will be obliged to transfer to the private sector. Which ancillary services will transfer will now be determined by value for money considerations. This new approach will apply to all future schemes and those which have not yet gone out to tender by placing a notice in the European Journal, The costs and delays in re-opening decisions on the provision of support services at more advance schemes cannot be justified.

Payment Mechanism

45. The FBC should set out any proposed variation from the Standard Payment Mechanism. PFCU should review the acceptability of any deviations from the standard payment mechanism for project specific reasons.

Section 3 – OBTAINING FORMAL APPROVALS

NHS Board

1. The NHS Board is required to consider and approve the FBC prior to consideration by the CIG. The Letter accompanying the FBC signed by the Chief Executive of the NHS Board must confirm that such an approval has been granted.

SEHD

2. Once the Finance Manager is content that the parameters of approval have been met a summary report is prepared and considered by the CIG. If approval is recommended the Head of CIG will write to the Head of SEHD seeking approval for the FBC to be formally approved. A copy of this letter should be sent to the SEHD Director of Finance and Performance Management together with Minister for Health and Community Care, his Deputy and Press Health. Written confirmation of approval should be obtained from the Head of SEHD.

CIG letter confirming approval

3. Once the relevant approvals have been obtained the Head of CIG should confirm in writing to the NHS Board that approval has been granted. The approval is time limited and is subject to the approval parameters remaining satisfied at contract close. It is also subject to the NHS Board meeting the SEHD's requirements on Openness [LINK TO SCIM SECTION].

Final Check before Financial Close

9. Immediately prior to contract signature, the PFCU must ensure that the Chief Executive of the NHS Board has confirmed in writing that any conditions in the SEHD letter of approval are satisfied and that the NHS Board up to the point of financial close maintains that the scheme remains value for money and affordable.

10. If the scheme is no longer VFM or affordable, the NHS Board must not sign the contract but take appropriate measures in consultation with SEHD to resolve the problem. This may involve renegotiating with the private sector.

Deed of Safeguard and EFDA – Certification under the NHS (Private Finance) Act 1997

10. NHS Boards have been given express powers to enter into "externally financed development agreements under section {INSERT SECTIONSts that have not yet got Foundation Trust status may require both an EFDA (for projects which exceed the delegated limits of the Trust) *and* Deed of Safeguard. The Deed of Safeguard establishes an obligation on the Secretary of State to meet the payment obligations of the NHS organisation under the PFI scheme, in cases where the NHS organisation is in default. The obligation will apply in the event that the NHS organisation ceases to have the protection of the National Health Service (Residual Liabilities) Act 1996 (the "RLA") – in other words when it becomes an NHS Foundation Trust. EFDA certificates will continue to be given for PFI schemes entered into by NHS Trusts that exceed its delegated limit.

13. The PFCU should ensure that the EFDA certificate is drafted prior to financial close and that the NHS Board and private sector lawyers have agreed the drafting. The PFCU should ensure that arrangements are in hand for a senior civil servant to sign the certificate at financial close confirming that the signed contract is an EFDA. The senior civil servant will also need to certify that the person signing on behalf of the S of S is empowered to do so as a member of the senior civil service. A sample EFDA certificate can be found in Appendix 10 of the Procurement Process (section 2) of the PFI guidance "Public Private Partnerships in the NHS: The PFI". Paragraphs 8.12 to 8.17 explain the purpose of the EFDA.

Publicity

14. The PFCU will need to inform Press Health regarding the arrangements for financial close and details of the scheme and ensure that an appropriate Press Release has been drafted. Depending on the size of the scheme publicity may only be at a local level. However, the NHS Board should ensure that Press Health within SEHD have reviewed and approved the Press Release prepared by the NHS Board.

APPENDICES

Appendix 1: Contacts at SEHD

INSERT CONTACT LIST

TITLE	POST HOLDER	TELEPHONE	E-MAIL
Head of Property and Capital Planning	David Hastie		
Head of Private Finance and Capital Unit	Michael Baxter		
PFI Facilitator	Norman Kinnear		
Finance Manager (East and North)	Bernadette Orbinski-Burke		
Finance Manager (Special Health Boards)	Robert Peterson		
Finance Manager (West)	Julie McKinney		
CIG Agenda Items	Glenda Roy		

Appendix 3: THE PFI FULL BUSINESS CASE APPROVAL CHECKLIST

Name of NHS BOARD	
Scheme Name	
Date of FBC	
Date of contract documentation	
Date of Financial Model	
Date of Addenda	

Checklist Signoff	Completed By	Date
Operating Division		
NHS Board		
SEHD Capital Investment Group		

1. Approvals

	Divn Yes/No	Board Yes/No	SEHD Yes/No	Cross Reference
1.1 The IA has been approved by: a the Trust Board (prior to dissolution date) b the NHS Board c CIG				
1.2 The OBC has been approved by: a the Trust Board (prior to dissolution date) b the NHS Board c CIG				
1.3 Any OBC addenda (required for capital cost increases excluding indexation of >10% or revenue cost increases of >5%) have been approved by: a the Trust Board b NHS Board c CIG				
1.4 The FBC and all subsequent addenda have been signed off by the NHS Board Chief Executive and the Finance Director				
1.6 The FBC and addenda have been approved by: a the NHS Board				

2.Strategic Context and Update from OBC

	Divn Yes/No	Board Yes/No	SEHD Yes/No	Cross Reference
2.1 The scheme forms a coherent part of the local health plan and provides a configuration of services that will be sustainable.				
2.2 Service configuration issues comply with both national priorities for health/planning and priorities guidance and Royal College and other professional recommendations.				
2.3 Full details are included on the consequences for other services, clinical networks, the local health economy and NHS organisations and commitments from parallel investments where these are required to meet national or local targets				
2.5 Bed and capacity modelling have: a) projected activity levels for at least 5 years into the schemes operational period and applied general trends to predict a further 5 years using the same factors as the [National Beds Inquiry??????] or other relevant guidance, b) where inpatient acute beds are not planned to rise a full explanation is provided and is supported by Clinicians.				
2.6 The bed /capacity modelling and service plans are consistent with the short term Local Health Plans and wider capacity plans				
2.7 All changes to the content or scope of the scheme and any cost increases from those presented at OBC stage are disclosed and explained.				
2.8 The business case is internally consistent.				

3.Stakeholder and Community Involvement

	Divn Yes/No	Board Yes/No	SEHD Yes/No	Cross Reference
3.1 All stakeholders with a material interest in the scheme have provided explicit written support to a) the strategic fit, service models and capacity, and b) financial impact of the scheme, including long term affordability implications. (Where there are large numbers of NHS Boards as service users, CIG expect at least 80% by value sign up to the consequences of the unitary charge, including the host NHS Board.)				
3.2 The scheme has the written support of clinicians/GPs (and other professionals as appropriate) and the FBC outlines how they have been involved in the design process and operational policies.				
3.3 The FBC details how Community Health Partnerships have been involved in the strategic decision making process as required under the terms of the NHS Reform (Scotland) Act 2004				
3.4 Formal public consultation on service changes has been fully completed by the NHS Board to involve and consult patients and the public. [Rferenence to compliance with guidance]				

4.Procurement and Gateway Processes

	Divn Yes/No	Board Yes/No	SEHD Yes/No	Cross Reference
4.1 The procurement process followed by the NHS Board conforms with EU regulations, in particular a) The appropriate procurement procedure has been used - usually the negotiated procedure for PFI scheme b) b) the correct process and relevant rules have been followed for the chosen procedure				
4.2 If the OGC Gateway Risk Potential Assessment (which enables the level of risk associated with a project to be assessed) has been completed the project's risk score is disclosed.				
4.3 The appropriate OGC Gateway reviews have been completed (high risk scores 41+ on the RPA are to be subject to external review, medium may be reviewed at Senior Responsible Officer's discretion) and it is noted that their conclusions have been acted upon, in particular assurance is provided that all high priority recommendations have been resolved.				

5.Human Resource Issues

	Divn Yes/No	Board Yes/No	SEHD Yes/No	Cross Reference
5.1 Workforce plans are set out in the FBC to demonstrate the impact of delivering the modernisation of patient care and workforce redesign (eg new roles for doctors, nurses and other clinical staff, European Working Time Directive, team based working).				
5.2 Where appropriate SE/STUC Protol requirements and guiodance has been fully complied with to all non-managerial staff providing catering, domestics, laundry, portering and security in accordance with the current guidance. Inclusion of any other services has been agreed with PFCU and all parties.				
5.3 All transferring staff are covered by TUPE.				
5.4 All transferring NHS staff will be provided with broadly comparable pensions as agreed by the Government Actuaries Department and copies of the GAD certificates or passports providing confirmation are included in the FBC and must be valid at the time the staff actually transfer (nb This requirement must be repeated upon any subsequent transfer as a consequence of a change of the identity of the service providers.)				
5.4 The assumptions that will apply to govern the calculation of bulk transfers have been agreed with GAD before financial close.				
5.5 The NHS Board can demonstrate an on-going dialogue with the Trade Unions.				
5.6 The private sector has agreed to recognise the trade unions of the transferring staff				
5.7 No staff working in clinical services are transferred to the private sector as part of the PFI contract, unless specific policy agreement has been obtained from Ministers. Details of the agreement are to be are fully disclosed (and PFCU should be notified at OBC stage).				

6.Design, Construction and Facilities Issues

	Divn Yes/No	Board Yes/No	SEHD Yes/No	Cross Reference
6.1 Full planning permission has been obtained for all the developments described in the FBC and the judicial review period has expired (or appropriate warranties have been agreed with PFCU). The impact of any conditions included in the planning permission is set out in the FBC.				
6.2 The NHS Board has obtained design data to the extent required by the Design Development Protocol II and has applied AEDET (Achieving Excellence – Design Evaluation Toolkit). [CHECK APPLICABLE]				
6.3 NHS Board has completed their review of the design, including technical standards, and are content with the overall fit with the NHS Board's estate strategy.				
6.4 NHS Board has reviewed progress on compliance with statutory health and safety requirements (e.g. firecode) and environmental standards [Greencode Reference????].				
6.5 The scheme complies with the SEHD policy on bed spacing which is X.Xm				
6.6 The scheme complies with the requirements as set out in 'Environmental Management Policy for NHSScotland [INSERT LINK]"				
6.7 **Hard FM services** are provided by Project Co over the life of the contract.				
6.9 The basis on the extent to which soft services are included in the scheme is set out in the FBC. [Soft services should only be excluded from the scheme if there are clear value for money reasons.]				
6.8 **Soft FM Services** must be value tested in accordance with an agreed acceptable and auditable procedure if included in the scheme. If market testing is chosen then 100% pass-through of cost savings/increases is required.				

7.IM&T Investment

	Divn Yes/No	Board Yes/No	SEHD Yes/No	Cross Reference
7.1 IM&T provision is in accordance with [SCOTTISH POLICY REQUIREMENT}.				
7.2 Where there is any non-compliance explicit support must be provided by the National Programme Office.				
7.3 Whether the IM&T is being procured separately or with the build, the Trust must confirm that both the IM&T and the build are covered by an overall project plan and show how the IM&T timetable fits with the build timetable.				
7.4 The build scheme as a minimum includes IM&T infrastructure "up to the socket", eg necessary cabling.				
7.5 Interdependencies between IM&T and build are identified and quantified in the following four areas: risks, benefits, value for money and affordability.				
7.6 Where the IM&T is being procured with the build, details are provided to show how the IM&T element is handled in the payment mechanism, with reference to the contract and financial model.				
7.7 Where IM&T is procured separately, specific funding has been agreed or funding issues have been identified with a commitment to provide appropriate funding.				
7.8 The Trust has a training plan in place for IM&T.				

8.Equipment

	Divn Yes/No	Board Yes/No	SEHD Yes/No	Cross Reference
8.1 The NHS Board has identified the equipment implications by asset category of the scheme. The FBC sets those implications in the context of how they will be met from (a) existing equipment to be transferred, (b) new equipment being procured in advance of the scheme and (c) equipment being procured as a part of or in parallel with the scheme.				
8.2 The FBC provides justification for the proposed equipment procurement routes including evidence that different options were considered and the rationale for and the value for money of the adopted approach.				
8.3 Where equipment is included in the PFI scheme the lifecycle assumptions are set out, together with replacement and technical refresh arrangements.				
8.4 The contribution to risk transfer of including equipment (especially items like linacs) is set out.				
8.5 Details are provided to show how equipment is handled in the payment mechanism, with reference to the contract and financial model				
8.6 Where equipment is included in the PFI scheme there are contract provisions to deal with: a) who installs, and is responsible for, what groups of equipment b) parties' liability for installation by its or its contractors (if Project Co not used) c) the impact of construction delay on equipment installation				
8.7 Where the managed equipment services in a PFI scheme is separable, the accounting treatment has been separately considered and has concluded it will be off balance sheet.				
8.8 For the equipment not included in the PFI scheme separate funding has been identified for each asset category with a sum for contingencies. The associated capital funding requirements are identified together with the appropriate commissioner support to any revenue consequences not included in the affordability of the overall scheme.				

9. Economic Analysis, Option Appraisal and Value For Money

	Divn Yes/No	Board Yes/No	SEHD Yes/No	Cross Reference
9.1 The economic and risk appraisals conform to SCIM, The Green Book and other relevant guidance				
9.2 The Generic Economic Model has been used to calculate net present cost/ equivalent annual cost calculations and underlying assumptions for the inputs are robust.				
9.3 The preferred option demonstrates the best value for money relative to other shortlisted options				
9.4 The Public Sector Comparator gives the same outputs and is not distorted by erroneous assumptions (e.g. timing re availability of public funds).				
9.5 The FB forms for the PSC have applied the appropriate BCIS cost data.				
9.6 Sensitivity analysis has been performed or switching points identified on the key variables (eg capital costs, fm service costs, lifecycle costs, interest rates) to demonstrate that the preferred option remains better value for money under a range of plausible scenarios, .				
9.7 Non-financial costs and benefits of the PSC and PFI are fully identified (eg design or service innovations) and the preferred option gives at least as good non-financial benefits unless it is demonstrated that financial factors clearly offset this.				
9.8 The value for money analysis has been conducted over the relevant appraisal periods. The period of the concessionary agreement and 60 years plus the build period.				

10. Risk

	Divn Yes/No	Board Yes/No	SEHD Yes/No	Cross Reference
10.1 An NPV/ EAC analysis of all quantifiable risks retained by the public sector under each of the options has been undertaken and input into Generic Economic Model				
10.2 Risks that cannot be easily quantified have been assessed by suitable methods.				
10.3 Suitable sensitivity tests of key assumptions underlying the risk analysis have been performed.				
10.4 A risk allocation matrix has been drawn up and included in the business case showing which party is responsible for managing risks. Every risk transferred to the private sector is cross-referenced to the relevant paragraph of the project agreement.				
10.5 Where available, empirical evidence has been used to value risk in the FBC. The valuation ascribed to other risks is adequately explained in the business case.				
10.6 The levels of risk are consistent with previous approved FBCs and supported by presented evidence.				

11. Financing Issues

	Divn Yes/No	Board Yes/No	SEHD Yes/No	Cross Reference
11.1 The weighted average cost of capital for the project is reasonable given the level of risk assumed by the private sector.				
11.2 The NHS Board's financial advisers have access to a copy of the financial model are satisfied with the build up of the unitary payment				
11.3 Funding costs have been benchmarked against other possible forms of funding and represent best value for money. A letter is enclosed from the NHS Board's financial advisers to support this.				
11.4 For bank financed schemes there are arrangements in place for benchmarking the swap rate at financial close.				
11.5 Composite Trader provisions have been applied and the Trust has received the full benefit (where not applied an explanation is set out and has been agreed with PFCU)				

12. Revenue Impact and Affordability

	Divn Yes/No	Board Yes/No	SEHD Yes/No	Cross Reference
12.1 The scheme is affordable given the NHS Board's' expected level of resources.				
12.2 Where applicable the level of new resources available to support the scheme and any efficiency savings as a consequence of the scheme are based on reasonable assumptions.				
12.3 The interest rate buffer (usually 0.25%) is sufficient to absorb any likely interest rate increases taking into account time to financial close and market movements.				
12.4 Affordability analysis allows for the cost of retained risk and suitable sensitivity analysis has been performed on all relevant variables in the affordability analysis.				
12.5 The NHS Board has been able to demonstrate to the satisfaction of the SEHD that it is in a sufficiently robust financial position to (i) undertake and sustain the contract and (ii) continue to meet their financial duties. In particular where the NHS Board is in financial deficit (or has a future projected deficit) the agreed strategy for achieving financial recovery is agreed with SEHD.				

13. Capital Sources

	Divn Yes/No	Board Yes/No	SEHD Yes/No	Cross Reference
13.1 Any elements of the scheme to be funded from NHS public capital or other sources (charitable, external grants etc) are clearly set out (eg enabling works, equipment etc) together with the profile of spend by year.				
13.2 The FBC clearly identifies and quantifies the elements of the scheme that are to be funded from PFI and other sources of capital. Justification and the vfm rational is provided for the non-PFI capital funds.				
13.3 Any significant commitments to fund the scheme / part of the scheme from charitable donations is confirmed in writing and any potential shortfalls are underwritten from operational or strategic capital.				

14. Land

	Divn Yes/No	Board Yes/No	SEHD Yes/No	Cross Reference
14.1 The FBC details all land transactions that have to be undertaken (a) in advance of the deal, (b) as a part of the deal and (c) subsequent to the deal, together with their source(s) of capital. This needs to include any acquisition of sites and/or transfers of ownership of land between NHS organisations/ Scottish Ministers.				
14.2 In rare instances where surplus land is included in a PFI scheme in exchange for a reduction in payments, the NHS Board should make sure that the scheme complies with the guidance on "Land and Buildings in PFI schemes" [LINK to Guidance}.				
14.3 The District Valuer has confirmed that open market value has been obtained for any land purchased and any surplus land included in the deal				
14.4 Any requirements to use land sale proceeds as a source of finance for the publicly funded elements of the deal are explicitly documented.				

15. Accounting Treatment

	Divn Yes/No	Board Yes/No	SEHD Yes/No	Cross Reference
15.1 The FBC should demonstrate that the schemes balance sheet treatment is consistent with the Treasury guidance in Technical Note Nº 1 Revised and the basis for the treatment is documented and supported by the NHS Board's Finance Director.				
15.2 The external auditor has confirmed in writing that he/she accepts the balance sheet accounting treatment and the audit opinion is based on the same draft concession agreement as in the FBC.				
15.3 The NHS Board's Finance Director has projected the impact of the deal on its annual accounts. The accounting treatment is consistent with GAAP and Departmental guidance, with the balance sheet and I/E impact set out in the business case for the whole contract period.				
15.4 The treatment of residual interest and deferred assets comply with the Department's Land and Buildings guidance. {LINK INSERT}				

16. Standard Contract Terms and Payment Mechanism

	Divn Yes/No	Board Yes/No	SEHD Yes/No	Cross Reference
16.1 a) Confirm that contract follows the SEHD Project Agreement terms including (where applicable) the schedules to the agreement. NB: A letter stating compliance is required to accompany the request for the EFDA certificate {NK WORDING].				
16.1 b) For project specific clauses and all departures from standard form a matrix of differences is provided in the business case which sets out the justifications.				
16.2 a) Confirm that the payment mechanism follows the SEHD standard				
16.2 b) All departures from the standard form and project specific clauses are set out in a matrix of differences in the business case which provides the justifications by the NHS Board for seeking such changes.				
16.3 The output and performance management specifications have been reviewed and have confirmed that: there are no major changes from the standards a) the level of tolerances and bedding in periods are appropriate b) the level and quality of any interim services are appropriate c) the programme for handover and level of training are acceptable				
16.4 Examples of a range of deductions are included as an appendix eg showing the impact of the area weightings.				

17. Project Specific Legal Issues

	Divn Yes/No	Board Yes/No	SEHD Yes/No	Cross Reference
17.1 **Refinancing** – The Trust achieves 50% gain of any refinancing and the terms follow PFCU's current guidance [LINK].				
17.2 **Insurance** – Provisions relating to insurance to be obtained by the NHS Board, are in accordance with current guidance requiring the NHS to self-insure.				
17.3 Schedule of required projectco insurances have been agreed with the NHS Board's insurance adviser and follows current guidance [LINK].				

18. Post Financial Close

	Divn Yes/No	Board Yes/No	SEHD Yes/No	Cross Reference
18.1 There is a benefit realisation plan covering all benefits, cash releasing and non-cash releasing, with responsibility for achieving benefits assigned to named individuals				
18.2 A project plan to completion of the new facility, with key milestones is included. A commissioning masterplan should also be included which highlights key milestones in the construction and occupation programme.				
18.3 Arrangements are in place to carry out a Post Project Evaluation 6 – 12 months after the facility has been commissioned with a further review two years later (to assess the long term outcome). [D HASTIE TO COMMENT]				
18.4 There is a comprehensive risk management strategy which includes NHS Board's actions to reduce risks before the new facility is operational.				
18.5 Satisfactory arrangements are in place to manage the contract both in it's construction and operational phases.				
18.6 Arrangements are in place to make the FBC and addendum public within a month following FBC approval with the executive summary (at least) available on the NHS Board's website.				

Appendix 4: Scheme Key Facts

Issue	Key Facts
General	
Scheme description	
Functional content	
Forecast financial close date	
Forecast start on site date	
Forecast practical completion date	
Bed numbers: Before (at time FBC approved) After	
Length of contract and break periods	
FM services included in the contract	
Name of consortium and its members	
Description of short listed options – do nothing, PSC, PFI	
Approvals	
IA/CS Approved by NHS Board	
IA/CS Approved by CIG	
OBC approved Date by NHS Board	
OBC Addendum Approval by NHS Board (where applicable)	
OBC approved Date by CIG	
OBC Addendum Approval by CIG (where applicable)	
FBC approved date by NHS Board	
FBC Consideration by CIG	
VFM	
Net present cost of the risk adjusted PFI and PSC options [60 years]	
Equivalent annual cost of the risk adjusted PFI and PSC options [60 years]	
Affordability	
Unitary payment (state price base)	
Interest rate tariff based on	
Current market rate	
Difference in £'s	
Cost **Funding requirement** Construction[1] Land[1] Equipment[1] Professional fees re building[1] Professional fees re financing Interest Other Total funding required **Sources of Funding** Land sales Trust funding Bank finance Sub debt Equity Other Total funding to be raised [1]Capital cost to the private sector	
Accounting	

Date of NHS Board Finance Director's opinion on accounting treatment	
Date of the External Auditor's opinion	
Land	
Breakdown of the parcels of surplus land included in the deal. give site name, DV valuation, value obtained in contract.	
Financial Issues Blended rate on equity	
Blended rate on debt	
Weighted average cost	
Funding structure	
Contracts	
Please provide the name and phone number of the following. Also give the companies name where appropriate.	
NHS Board Chief Executive	
NHS Board Finance Director	
Lead Project Manager	
Lead Financial Adviser	
Trust Legal Adviser	
Trust Property Adviser	
Project manager for the consortium	
External Auditor	
Parties responsible for due diligence.	

Appendix 5: The appraisal period of PFI options

1. The aim of this brief note is to clarify the appropriate appraisal period for PFI construction projects, and to outline the costing methodology that should be followed. For publicly funded options, the guidance is clear that they should be appraised over 60 years. In general, for the purposes of determining value for money, PFI options should also be appraised over 60 years.

2. One of the options open to trusts using the 'standard contract' is for the asset to revert back to NHS ownership at the end of the primary contract period. Therefore, the asset has a value of the NHS at the end of this period. For a fair comparison with the publicly funded options, this value to the NHS cannot be ignored in the appraisal of the PFI option.

Methodology

3. The analysis should assume an extension of the PFI contract until the end of the appraisal period. As with the public sector comparator, the PFI option should also assume the same output requirements throughout the 60-year period. Uncertainty around this assumption should be dealt within the risk and sensitivity analysis.

4. Another option of including the residual value in the appraisal would be to add the estimated market value of the asset to the PFI option at the end of the primary lease period. However, the appraisal would then be making different assumptions for the public and private options. The publicly funded option assumes that the facility continues to be used to provide health care, because this is of greater value to the NHS than the asset's market value. Therefore, even it if was possible to estimate the market value at the end of the primary period, it would under-estimate the true value to the NHS.

5. The NHS Board does have alternatives to extending the PFI contract at the end of the primary period. For example, the analysis could assume that the Board takes over the asset, and provides the services 'in-house'. But the majority of cases this is less likely. Alternatively, the analysis could assume that the Board awards the contract to a different commercial operator. But the cost modelling would effectively be the same as for a contract extension.

6. The financial model used by the private sector supplier can be used to estimate the costs after the primary contract period. The individual cost elements are discussed below.

Financing Cost

7. As with the public sector comparator, the baseline costs should assume that no major re-configuration of services is required, so the private sector will not need to incur any further borrowing. Therefore, the costs in the secondary period will not include debt payment or equity returns.

Operating costs

8. The estimated costs in the secondary period should be based on the same assumptions as the costs in the primary period.

Lifecycle and maintenance costs

9. The SEHD Project Agreement specifies what condition the asset should be in at the end of the period covered by the primary contract. However, given that PFI contracts are typically for approximately 30 years, assets may not be built to last for 60 years. Therefore, an allowance for higher maintenance and lifecycle costs should be included in the estimated costs in the period after the primary contract period.

SPV (Special Purpose Vehicle) costs

10. The services are likely to have been sub-contracted out by the SPV, with the SPV providing a management service. The estimated SPV costs should include assumptions about the resources needed to provide the service, the SPV's profits, and tax liabilities on their profits.

Appendix 6: Financial Model Content

1. Summary sheet

This sheet should detail:

Date and time of model preparation
Contract signature date assumed
Financial close date
End of construction date
Start of operation date
End of concession date
Period for D&B (years and months)
Period of concession – primary
Period of concession – secondary

Economic assumptions

Indexation base date
RPI
Taxation rate
VAT rate
WDA rate
Qualifying P&M (%)

Debt assumptions

Swap rate
Credit margin on swap
Swap period
MLAs (Mandatory liquid assets)
Construction margin (%)
Operating margin (%)
Deposit margin (%)
Working Capital margin (%)
Percentage debt arrangement fee (%)
Percentage commitment fee (%)
Maximum required funding (£)
Total committed funding (£)

Bonds

Gilt rate
Wrapping/monoline credit margin
Credit margin for AAA rated bond etc

Source and use of funds	**£**	
Sources		
Senior debt		x
Equity share capital		x
Subordinated debt		x
Other		X
		X
Uses		
Construction		x
Other capital expenditure	x	
Debt management fee		x
Debt commitment fee		x
Interest during construction	x	
Debt service reserve account	x	
Other		x

1.

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Other capital expenditure should be analysed into its constituent parts. This will include set up costs.

Bank ratios

ADSCR and LLCR
Minimum
Average
Default

Key project results (Nominal and Real should be shown)

	Nominal	***Real***
Pre tax project internal rate of return (IRR)	x%	x%
Post tax project internal rate of return (IRR)	x%	x%
Blended returns to equity and sub debt - pre tax	x%	x%
Blended returns to equity and sub debt – post tax	x%	x%

Reserves

Summary of any reserves and what they represent
E.g. DSRA 6 months bank repayments

SPV operating costs]

Line by line analysis of

SPV operating costs
Services costs by service

2. Cover ratios

Schedule of cover ratios for each bank-monitoring period showing the ADSCR and the LLCR at each (presumably six monthly) period end.

3. Construction cost schedule

Analysis of construction cost expenditure by month throughout the construction period, analysing both construction and other capital expenditure.

4. Cash flow statement

Detailing the SPV cash flows on a line by line basis for each year of the primary concession period. This should include as a minimum:

Availability payment by trust.
Services payment by trust.
Receipt of bank debt
Receipt of equity and subordinated debt
Construction costs
Other project related costs
Debt arrangement fees
Debt commitment fees
Debt capitalised interest
Debt service reserve flows
Senior debt repayments
Senior debt interest payments
Dividend payments
Subordinated debt repayments
Subordinated debt interest payments

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5. **Profit and loss account.**

6. **Balance sheet**

7. **Back up schedules**

Back up schedules should detail the calculation of projects IRRs, tax charges etc.

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FULL BUSINESS CASE – PPP/PFI ADDENDUM (FBC(A))

PURPOSE

After financial close, an addendum to the FBC should be prepared. The Addendum should set out any changes in the project between FBC approval and financial close and summarise the commercial contract in plain English.

MANDATORY FOR:

- For all PPP/PFI projects irrespective of value.

CONTENTS

The FBC(A) should contain the following information:

1. Description of any changes in the project since FBC approval.
2. Details of the Contract Structure.
3. A diagram of the Contractual Framework.
4. Brief Summary of the Project Agreement with a plain English commentary on the main project agreement clauses.
5. Economic analysis demonstrating that the PPP/PFI procurement still delivers value for money.
6. Financial appraisal demonstrating affordability.
7. Assessment of Risk Transfer.
8. Accounting Treatment.

The FBC(A) should be signed off by the NHS Board or Special Health Board Chief Executive

Appendix on Optimism Bias

This appendix sets out the principles behind the introduction of an adjustment for optimism bias. It also presents guidance as to how optimism bias adjustments should be applied to NHS Business Cases.

The adjustment for optimism bias should be seen in the wider context of the full set of changes introduced by the Treasury in the new Green Book [ref]. The adjustment for optimism bias, in effect, follows from two of the main changes in the new Green Book:

- **Reduction in the discount rate from 6% to 3.5%.** The new discount rate should reflect the time value of costs and benefits, where before the discount rate also accounted for risk, which is now considered separately.
- **Explicit consideration of Optimism bias.** This should be accounted for over and above the other types of risk which are traditionally considered as part of the appraisal process.

Optimism bias is not, therefore, a new concept but rather the treatment of optimism bias has now changed such that, rather than incorporating some allowance for optimism bias into the discount rate, optimism bias should be allowed for through an explicit adjustment, separate from discounting. This appendix sets out how such an adjustment should be made.

Optimism bias

Optimism bias refers to the tendency when evaluating publicly funded projects to overestimate the benefits and underestimate the costs. Evidence from the Treasury indicates that public sector procurement options typically suffer from optimistic bias in the estimation of costs and benefits.

In order to redress this tendency towards optimism, explicit adjustments should be made to estimates of costs, benefits and works duration as part of the economic appraisal process.

These adjustments should, wherever possible, be based on appropriate empirical evidence. Based on a study of past projects[6], the Green Book provides explicit guidance relating to the appropriate level of optimism bias that should be applied to different types of projects during their appraisals. As explained below, the Department of Health has derived NHS specific adjustment factors based on evidence as to the extent of optimism bias in past health capital projects. The optimism bias adjustment factors are currently under review by ~~T~~the Scottish Executive.~~–~~ The Department of Health adjustment figures should therefore be used until further guidance is issued [URL].~~intends to replicate this study to provide Scottish specific estimates of optimism bias adjustment factors.~~

[6] The treatment of optimism bias in the Green Book is based on 'Review of Large Public Procurement in the UK', by Mott MacDonald. The study is a detailed assessment of 50 major projects (with costs exceeding £40m in 2001 prices) in total, comparing their planned and actual performance. Analysis of these projects has enabled the calculation of optimism bias levels for certain project types and an assessment of optimism bias trend over time.
http://www.hm-treasury.gov.uk/media//62ABA/greenbook_mott.pdf

An important point to note is that such information on average optimism bias factors, even where health specific, should be used only in the case where no other evidence relating to optimism bias exists locally. The adjustment for optimism bias is designed to compliment and encourage, rather than replace, existing good practice in terms of calculating project specific risk adjustments. If appraisers have a robust evidence base for cost overruns and other instances of bias, this evidence should be used in preference to the generic evidence provided. Where such information is not available, the evidence based on surveys of past projects may be considered to provide the best information from which to determine adjustment values for individual projects.

It is also worth noting that, where there is no obvious empirical evidence relevant to the project to be appraised, this may indicate that the project is unique or unusual, in which case optimism is likely to be high. In these cases, adjustments should be based on the nearest available project type, and adjusted depending on how inherently risky the project is relative to the nearest equivalent project type.

Optimism Bias in Health Sector Business Cases

The two types of optimism bias most relevant to health are works duration bias and capital expenditure bias. Works duration optimism bias refers to the implementation stage of the project, including design, mobilisation and construction. This measure reflects the extent to which the works duration of the project has increased relative to what was outlined in the outline business case. Capital expenditure optimism bias provides a measure of the relative increase in capital expenditure from what was estimated at outline business case relative to the actual capital outturn.

Based on an examination of a sample of past business cases and of the returns to the Health Select Committee, the Department of Health has prescribed the following percentage increases in capital costs between OBC and FBC, after stripping out increases due to inflation as measured by the MIPS index:

~~As noted above, a Treasury sponsored study determined average optimism bias factors to be used dependent on project type (project type should be determined by its dominant characteristics). These are set out in the table below.~~

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Table 1 – Optimism Bias Guidelines

Project Type	Optimism Bias (%)			
	Works Duration		CAPEX	
	U	L	U	L
Non-standard buildings	39	2	51	4
Standard Buildings	4	1	24	2

Project Type	Optimism Bias (%)			
	Works Duration		CAPEX	
	Upper	Lower	Upper	Lower
Standard Buildings in excess of £25m	15-20	1	30	1
Standard Buildings between £0m and £24m	15-20	2	40	2

Standard buildings include projects that do not require special design considerations; this category should include most general hospitals.
Non-standard buildings require special design considerations.

~~Based on an examination of a sample of past business cases and of the returns to the Health Select Committee, the Department of Health has prescribed the following percentage increases in capital costs between OBC and FBC, after stripping out increases due to inflation as measured by the MIPS index:~~

	~~Upper Bound~~	~~Lower Bound~~
~~Projects with a capital cost in excess of £25m:~~	~~30%~~	~~15-20%~~
~~Projects with a capital cost of between £10m and £25m:~~	~~40%~~	~~10-15%~~

~~**[what about smaller cases??!!]**~~

Applying Optimism Bias Adjustments

Optimism bias adjustments should be based on the best empirical evidence *relevant to the stage of the appraisal*. Upper Bound (U) Optimism Bias represents the optimism bias level to expect for a project without effective risk management and the lower bound represents the optimism bias level to expect with effective risk management. Note that these values are indicative starting values for calculating optimism bias levels in current projects. The upper bound does not represent the highest possible values for optimism bias that can result and the lower bound does not represent the lowest possible values that can be achieved for optimism bias. However, in the large majority of cases we would expect the measured level of optimism bias to fall within the range between the upper and lower bound values.

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To illustrate how these adjustment figures are applied, take the example of a hospital with a capital value of over £25m, which has been defined as a standard building and has been assigned the upper bound value of Capital Expenditure optimism bias for a project of this type, which is 30%. The Net Present Capital Cost of the project would be determined in the usual way, with the Capital NPC then increased by 30% to reflect the optimism bias adjustment. The resulting figure represents the new Optimism Bias-adjusted Capital NPC of this project. If the original Capital NPC was £100m, then the new Capital NPC would be £130m. This new figure for capital NPC would then be added in the usual way to the Revenue NPC to give the Total NPC for the project.

Works duration literally means how much longer it takes to complete the works. Longer durations often raise costs, and any such costs should already be incorporated into the optimism bias for costs throught the NPV. Where a project is expected to take 100 weeks to complete, a figure of 15% works duration optimism bias would suggest that the project would in fact take 115 weeks to completion. This should be accounted for, both in a delay in the benefits accruing by 15 weeks and also by allowing for any other impact on the extent or timing of project cashflows.

~~To illustrate how these adjustment figures are applied, take the example of a hospital with a capital value of over £25m, which has been defined as a standard building and has been assigned the upper bound value of Capital Expenditure optimism bias for a project of this type, which is 30-40%. The Net Present Capital Cost of the project would be determined in the usual way, with the Capital NPC then increased by 30-40% to reflect the optimism bias adjustment. The resulting figure represents the new Optimism Bias-adjusted Capital NPC of this project. If the original Capital NPC was £100m, then the new Capital NPC would be £130m-£140m. This new figure for capital NPC would then be added in the usual way to the Revenue NPC to give the Total NPC for the project.~~

Adjusting for Mitigation

A structured approach should be adhered to when trying to determine the level of optimism bias to be applied to a particular project. This approach can be applied to all types of building projects (standard, non-standard etc) and refers to both the main types of optimism bias, both Capital Expenditure and Works Duration. For ease of illustration, the approach outlined below is confined to calculating Capital Expenditure Optimism Bias in the case of standard building projects, but the principle remains the same.

The general approach can be outlined as follows. There are several factors that have been shown to consistently influence the level of optimism bias, both Capital Expenditure and Works Duration, for both non-standard and standard buildings. These factors vary in the extent to which they contribute to optimism bias across both types of optimism bias and both types of projects. Table 2 below lists these factors and the percentage contribution they make to the level of Capital Expenditure Optimism Bias in Standard Buildings. The information in the table informs us, for example, that the 'Inadequacy of the Business Case' factor contributes 34% to the level of optimism bias in standard buildings. This is the most significant contributor.

The table also demonstrates the methodology an appraiser should apply when trying to ascertain the optimism bias adjustment that should be applied to a particular project. Table 2 shows that if we start with the default Upper Bound Optimism Bias figure (40%) and multiply this by both the contribution factor and the mitigation factor (these will naturally vary across the contributory factors) this indicates the amount by which the optimism bias upper bound figure should be reduced.

Each contributory factor is considered in turn, and a specific risk factor determined based on action that has already been taken or is to be taken by the managers of the project to mitigate this factor. For example, considering the 'Inadequacy of the Business Case' factor, if there is evidence that the guidance on mitigating this factor has been followed to sufficient extent, then the appraiser may decide that the influence of this factor on optimism bias has been mitigated by, say, 50%, which gives a mitigation factor of 0.5 (0 means that contributory factors are not mitigated at all, 1 means all contributory factors are mitigated). The list below Table 2 summarises the guidance on the factors in each case that need to be addressed before an appraiser can decide on the extent to which each contributory factor has been mitigated, if at all.

This mitigation factor is then used to determine to what extent optimism bias should be reduced from its upper bound value, by carrying out the same process for each of the factors, summarised in Table 2.

Table 2 – Calculating Capital Expenditure Optimism Bias Standard Buildings

Contrabutory Factors	Percentage Contribution %	Mitigating Factor	Reduce Upper Bound (30%)
Procurement			
Complexity of Contract Structure			
Late Contractor Involvement in Design	2%	0.4	0.2
Poor Contractor Capabilites	9%	0.6	1.3

Government Guidleines			
Dispute and Claims Occurred	29%	0.7	4.9
Info Management			
Other (Specify)			
Project Specific			
Design Complexity	1%	0.3	0.1
Degree of Innovation	4%	0.6	0.6
Environmental Impact			
Other (Specify)			
Clinet Specific			
Inadequacy of Business Case	34%	0.5	4.1
Large Number of Stakeholders			
Funding Avaliability			
Project management Team	1%	0.2	0.05
Poor Project Intelligence	2%	0.3	0.1
Other (specify)	1%	0.4	0.1
Environment			
Public Relations	2%	0.4	0.2
Site Charateristics	2%	0.5	0.2
Permits/Consents/Approvals			
Other (Specify)			
External Influences			
Political			
Economics	11%	0.6	1.6
Legislation /Regulation	3%	0.6	0.4
Technology			
Total	100%		14

Once this process has been carried out for all factors, the appraiser should have an accurate estimate of the extent to which the Upper Bound Optimism Bias has been reduced, which gives a new figure for optimism bias for the project in question. For example, Table 2 shows a total reduction in optimism bias of 14% from the Upper Bound for the project in question, with the new figure for optimism bias 1~~0~~6% (30~~24~~%-14%). This figure is then applied to the Net Present Capital Cost of this project using the methodology explained earlier, to estimate the optimism bias-adjusted Capital NPC. If we assume that in this particular case, the Capital NPC of the project is £100m, then the new projected capital cost of the project is £11~~0~~6m (£100m plus 1~~0~~%). The exact value of optimism bias present will vary across different projects, even within the same project type, and will depend on the extent to which the various risk factors contributing to optimism bias are mitigated in each case

Factors that Determine Extent to which Contributory Factors to Optimism Bias are Present in all Projects
[Formatting]

1. **Complexity of Contract Structure**
- Details of risk transfer had to be clarified
- Payment Mechanisms had to be defined
- Unforeseen amount of negotiation required on terms of contract

2 **Late Contractor Involvement in Design**
- Value Management was necessary but contractor was not involved early enough to allow for it
- The design could not be built due to construction problems (e.g. access)
- Contractor provided design/construction feedback at a late stage resulting in a redesign

3. **Poor Contractor Capabilities**
- Contractor was inexperienced
- Site Health and safety standards were not met
- Construction was not carried out to the necessary standards
- The contractor had insufficient resources

4. **Government Guidelines**
- No precedent or guideline had been developed to procure a leading edge project

5. **Dispute and claims**
- Dispute over interim payments
- Claims for changes in scope
- Claims for late release of information by other stakeholders

6. **Information Management Systems**
- The interfaces between the stakeholders were not managed efficiently resulting information not being transferred effectively

7. **Design Complexity**
- The construction was to take place over an existing mine, thus requiring complicated foundations
- The design had to be built in difficult conditions e.g a hydropower station

8. **Degree of Innovation**
- New generation design

- Unusual site conditions requiring innovative solutions e.g large wind forces, chemical nature of soil and soil contamination

9. **Environmental Impact**
- Contamination e.g nuclear power station, icinerator
- Noise pollution e.g airports
- Impact on wildlife e.g new road through protected area

10. **Inadequacy of Business Case**
- Number of services were not anticipated
- Output specs were not defined clearly
- Oversight in facilities required
- All stakeholders were not involved and so their needs were not defined and included in business case

11. **Large Number of Stakeholders**
- Different public sector parties having different interests in the project
- Process of obtaining approval took longer than expected due to number of parties involved

12. **Funding availability**
- Difficulties in obtaining financial backing for project
- Additional funding was made unexpectedley available later on in project thus changing project scope

13. **Project Management Team**
- The project management team was inexperienced in delivering a project of this nature
- Inadequate review of drawings by project manager before construction

14. **Poor Project Intelligence**
- Insufficient ground investigation
- The detailed design was based on insufficient site information
- Insufficient surveying of existing conditions e.g. for refurbishment of buildings

15. **Public Relations**
- Opposition from the local community (with regard to traffic and construction noise and environmental impact)
- Environmental protests

16. **Site Characteristics**
- The presence of badger setts within construction site
- Underground stream requiring protection during construction
- Archaeological findings

17. **Parliamentary Bill required for project initiation**
- Difficulties in obtaining planning permission, possibly resulting in an appeal to Secretary of State

18. **Political**
- Opposition by a major political party
- Impact on sensitive constituencies
- Lacks support from key political stakeholders

19. **Economic**
- Change in market demand resulting in a change in funding priorities
- Crash in stock markets

20. **Legislation/Regulations**
- Change in required standards

21. **Technology**
- Unanticipated technological advancements
- Computer virus

- Limits in technology

DoH guidance on the application of optimism bias should be consulted: http://www.doh.gov.uk/pfi/changesgreenbookdec03.htm. The Scottish Executive will shortly issue further guidance as to the factors to apply in Scotland, although the principles outlined in this section will remain the same.

Works Duration Optimism Bias

The same principles apply when calculating the adjustment to be made for Works Duration Optimism Bias for a project. This refers to the length of time it will take to complete the capital works, over and above the initial estimate by appraisers. The application of optimism bias adjustments to works duration should be reflected in a delay in the receipt of benefits, which will be shown in the Net Present Value calculations.

The same contributory factors used to calculate capital expenditure optimism bias are used to determine the extent to which the adjustment for works duration bias should be reduced from the upper bound for a particular project, but these same factors are allocated different weightings. The Treasury Green Book again lists each of the factors and the percentage contribution they make to the level of Works Duration Optimism Bias in Standard Buildings. Again, it is possible to establish the importance of the mitigation factors for each contributory factor. In line with the methodology outlined earlier for calculating capital expenditure bias, these combine to indicate the amount by which the optimism bias upper bound figure (420%) should be reduced.

For example, where mitigation factors suggest a total reduction in upper bound optimism bias of 10% from the Upper Bound for the project in question, the new figure for optimism bias in works duration will be 10% (20%-10%). Recall that this figure was in the case of capital expenditure optimism bias applied to the NPC (Net Present Cost) of the project to give the optimism bias adjusted figure. In the case of works duration, the figure for optimism bias, in this case 10%, is applied to the estimated works duration of the project to give the optimism bias adjusted works duration.

If we assume that in this particular case, the works duration of the project is 200 days, then the new projected works duration of the project is 220 days (200 days plus 10%). ~~For example, where mitigation factors suggest a total reduction in upper bound optimism bias of 2% from the Upper Bound for the project in question, the new figure for optimism bias in works duration will be 2% (4% 2%). Recall that this figure was in the case of capital expenditure optimism bias applied to the NPC (Net Present Cost) of the project to give the optimism bias adjusted figure. In the case of works duration, the figure for optimism bias, in this case 2%, is applied to the estimated works duration of the project to give the optimism bias adjusted works duration.~~

~~If we assume that in this particular case, the works duration of the project is 200 days, then the new projected works duration of the project is 204 days (200 days plus 2%).~~ Again, as with capital expenditure optimism bias, the exact value of optimism bias present will vary across different projects, even within the same project type, and will depend on the extent to which the various risk factors contributing to optimism bias are mitigated in each case. This method of assessment can be applied throughout the project life cycle for a project (e.g. strategic outline case, outline business case and full business case).

As mentioned earlier tr..... The application of optimism bias adjustments to works duration should be reflected in a delay in the receipt of benefits, which will be shown in the Net Present Value calculations.

Summary

The key benefits are:
Allows a better estimate earlier on of the key parameters for a project.
Encourages work to be undertaken to identify and mitigate project specific risks, increases confidence in estimates and encourages better post-project management of risks. Risk management in the public sector should aim to eliminate those issues that cause cost and time overruns, and benefits shortfalls.

Project costs, duration or benefits are considered optimistic when they do not fully reflect the chances of cost and time overruns or shortfalls in the delivery of project benefits.

For further guidance on and more detailed explanation of optimism bias, please refer to the supplementary guidance issued by the Treasury at:

http://www.hm-treasury.gov.uk/media//50A21/GreenBook_optimism_bias.pdf

Scottish Government Health and Social Care Directorates
Health Finance Directorate – Capital & Facilities Division
Capital Investment Group – Terms of Reference

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Date:	3/11/15

Introduction

The purpose of this document is to provide a Terms of Reference for the Capital Investment Group (CIG). Annex 1 provides an overview of the procedures that CIG employs to achieve its purpose, while Annex 2 provides a list of current members.

Purpose of the Capital Investment Group

The SGHSC Capital Investment Group oversees the approval process for business cases across NHSScotland where the value of the capital project is greater than the Board's delegated limit.

The CIG will collectively review and consider each Business Case against the requirements within the Scottish Capital Investment Manual. This role covers all NHSScotland infrastructure investment regardless of the ultimate funding route pursued by the procuring organisation. The scope of CIG's review of business cases will cover the totality of the change envisaged by the project, not only the infrastructure elements.

By reviewing and making recommendations on the approval of the business cases submitted to it, the CIG gives NHSScotland bodies the assurance of SGHSC support for the strategic justification for progressing capital schemes whilst sending a clear indication to the private sector of the projects which are supported by SGHSC. The CIG role is vital in providing the necessary assurances to both Scottish Ministers and SGHSC Management Board that proposals are robust, affordable and deliverable, and that they are in line with wider NHS policy and the 20:20 Vision.

CIG's role extends throughout the process of development and delivery of projects, through to the ultimate realization of benefits. As such, CIG may request reports from procuring organisations on approved projects in progress.

The goal of CIG is to act as a catalyst for the development, promotion and distribution of best practice and guidance within capital planning and development. A particular focus of this is the review of Project Evaluation and ensuring lessons learned and best practice are being widely shared across NHSScotland.

Meetings

The CIG meets every three weeks. Dates of meetings will be circulated by Scottish Government, Health Finance and Infrastructure Division in advance. Meetings are normally planned for the full year at a time in order that NHSScotland Boards can be advised of the dates for planning the submission of documentation.

The CIG Chair will determine the Agenda for each CIG meeting and this will normally be circulated with any relevant papers at least one week in advance of the CIG meeting. Business Cases will normally have been circulated prior to this due to the necessary commenting process.

The CIG Chair may require additional special meetings to take place on an occasional basis where it is necessary to review a Business Case particularly expediently, to close out a conditional approval (in exceptional circumstances), or for some other extraordinary reason. In certain circumstances this may take place by conference call or email agreement, however will still be formally recorded as a CIG meeting if decisions are taken.

Chair

The Deputy Director (Capital and Facilities) will chair the CIG meetings. In his absence, the Capital Finance and Policy Manager will act as deputy Chair and chair the CIG meetings.

Where neither the Deputy Director (Capital and Facilities) or the Capital Finance and Policy Manager are available, the meeting will normally be rearranged. However, in exceptional circumstances, the Deputy Director (Capital and Facilities) will nominate another CIG member to deputise on a one off basis.

Attendance at Meetings / Quorum

For a meeting of the CIG to be properly constituted, either the chair or deputy chair must be present. In addition, a simple majority of members should normally be in attendance, and at least one representative from each directorate / division / branch should ordinarily be in attendance unless agreed in advance with the Chair.

Where members are unable to attend a CIG meeting they must submit apologies at least one week in advance, where possible, to the CIG Secretary. Members should usually nominate a deputy to attend on their behalf and should advise the CIG Secretary of this when giving apologies. The deputy must have the authority and autonomy to provide comment and approval on behalf of their respective department.

The CIG Chair has the final decision as to whether a decision making quorum is present and whether decisions can be taken on a particular Business Case or issue at the meeting.

Membership

Membership of the CIG is comprised of representatives from the following directorates / divisions / branches:

- Health Finance and Infrastructure;
- Performance and Delivery;
- Healthcare Quality and Strategy
- Chief Medical Officer Directorate;
- Chief Nursing Officer Directorate;
- Population Health Improvement;
- Analytical Services;
- Primary Care Division;
- Joint Improvement Team;
- Health Finance;
- eHealth; and
- Chief Dental Officer.
- In addition, a representative of Scottish Futures Trust will be a member.

A full list of CIG membership is included as Annex 2.

Responsibilities of CIG members

CIG members play an important role and undertake:

- To declare any conflict of interest that may arise in the course of a review as soon as it is identified
- To conduct and complete all reviews in a professional and efficient manner
- To conduct and complete all reviews within the timetable established and meet all interim deadlines as set by the Capital and Facilities Division
- To ensure attendance at CIG meetings and where this is not possible, to provide a deputy with sufficient authority to approve or reject business cases or provide written comments in advance of meetings.
- To ensure all business cases receive a consistent degree of scrutiny in accordance with best practice

Decision Making

CIG does not have the delegated authority to approve projects or expenditure. CIG makes recommendations to officials with the appropriate delegated authorities, usually the Director General for Health and Social Care.

Annex 2 – CIG Procedures

Business Cases

Business Cases are received by the SGHSCD a minimum of 4 weeks prior to the relevant CIG meeting. The Deputy Director (Capital and Facilities) as CIG Chair will determine which Business Cases are to be included on the agenda for the forthcoming CIG meeting. They will then be circulated to CIG members and any other relevant colleagues (as determined on a case by case basis) for comment.

On circulation of a Business Case, the Health Finance and Infrastructure Division will set deadlines for CIG members to respond with queries for the relevant NHSScotland Board. Members are required to respond with queries in accordance with these deadlines and this is essential to the effectiveness and efficiency of the process and critical to meeting the overall deadline of all comments being fully closed out by the CIG meeting. Each query will be allocated a unique reference number by the Health Finance and Infrastructure Division.

The Health Finance and Infrastructure Division will subsequently coordinate the queries for issue to the NHSScotland Board and will issue these with a deadline for response. CIG members will be advised of this deadline to assist with planning of workload.

Once responses are received from the NHSScotland Board, these will be distributed to query originators for review as appropriate. This will either result in a query response being deemed satisfactory and approved or in a further round of queries / responses with the NHSScotland Board. Any communications outwith the standard query sheet, e.g. telephone conversations or meetings must also be recorded on the master query pro forma.

All the business cases are circulated to the members of CIG to consider not only the content of the business case but also the deliverability of the project and to examine the extent to which the project matches the national, regional and local priorities as articulated in Local Delivery Plans and associated Property Strategies. Each CIG member will focus on their specialist specific area of the business case, for example financial or clinical aspects, and submit their comments to Health Finance and Infrastructure in advance of the meeting. The CIG member can however comment on other aspects of the business case if he/she considers it appropriate.

Since business cases are required to be submitted a minimum of 4 weeks prior to the CIG meeting where they are to be considered, this allows an opportunity for an early discussion on the Business Case at one meeting prior to the meeting where the CIG is to be formally considered. This discussion may set out which individuals / departments must review which parts of the Business Case and must either attend the next CIG meeting or provide their approval (or otherwise) prior to the meeting.

There will be specific circumstances where a particular individual or department must be represented at the CIG meeting where a particular project is to be discussed. For example:

- A project with an acute component will require representation from the Performance Management department.
- A project with a dental component will require a representative of the Chief Dental Officer to be part of the decision making process.
- Any Primary Care projects will require a representative of the Primary Care Division to be part of the decision making process.

Dependent on the nature of a particular case, relevant policy and clinical colleagues will also be consulted on the content of business cases. The CIG Chair will determine which individuals must review each Business Case and this will be advised and minuted at the CIG meeting prior to the meeting where the Business Case is to be considered.

It is essential that each directorate / division / branch keeps the Health Finance and Infrastructure Division informed of any personnel changes which affect their representation on the Capital Investment Group.

The CIG members, acting as a group, decide whether or not to recommend approval the project, and if endorsed, make the appropriate recommendation to the Director of Finance, eHealth and Analytics or Director General of Health and Social Care, or seek the appropriate clarification from the NHSS body on issues to be resolved prior to a recommendation for approval.

CIG will not ordinarily recommend conditional approvals for Business Cases with such Business Cases normally carried over to a future meeting. In exceptional circumstances the Chair of CIG may permit a conditional approval. In these circumstances, the conditional approval will be formally minuted as such, and the minutes and approval letter will clearly state the conditions to be met for full approval. In addition, once the conditions are met they will require to be reviewed and formally closed out at a future CIG meeting.

Once a Business Case is approved it will be formally minuted and updated on the CIG Project Tracker by the Health Finance and Infrastructure Division. The approval / rejection of a business case will be formally notified in writing to the appropriate NHSScotland Body. The letter will be issued by the appropriate official within SGHSC with delegated authority to approve the proposed scheme. The Health Finance and Infrastructure Division will arrange for the relevant approval letter to be issued. This approval letter will request the Boards to provide the date(s) of any subsequent Business Case submissions, as well as an overall project timetable to allow the Health Finance and Infrastructure Division to update the Scottish Government Master Programme of the key dates to allow planning of CIG and Health Finance and Infrastructure Division workload. The NHSScotland Board should also be advised that they are responsible for advising Scottish Government of any changes to these milestone dates.

If a recommendation cannot be made by CIG because of outstanding issues with the business case, the case will normally be addressed through expedited procedures. In such cases Health Finance and Infrastructure will communicate with the relevant NHSScotland body explaining this. The normal process for notification will then apply. The aim is to conclude this process as quickly as is possible.

Within 5 working days of each CIG meeting, the Secretary circulates a draft minute of the meeting to members. Members then provide any comments or corrections within 5 working days. These minutes are circulated to the Cabinet Secretary for Health and Wellbeing, DG Health and Social Care and Health Communications.

The Health Finance and Infrastructure Division will ensure that the NHSScotland Board submits a public version of the business case within 1 calendar month, or if this is not possible as soon as is practical thereafter.

Responsibilities of Capital and Facilities Division

The Health Finance and Infrastructure Division will undertake the role of CIG executive and secretariat and will take responsibility for all administration, coordination and updating of the CIG Project Tracker etc.

Within the CIG process plays the following key roles

- To place the dates of the CIG meetings, and dates for the submission of business cases on the Capital Planning website
- To acknowledge receipt of a business case within one business day of being received
- To circulate the agenda, business cases and any relevant papers in advance of the CIG meeting
- To record the minutes and decisions of the CIG meetings
- To circulate the minutes, decisions and recommendations of the CIG meetings to SGHSC Management and appropriate Scottish Minister(s)
- To maintain a record of the progress of endorsed projects
- To maintain a record of the progress of conditions attached to CIG decisions
- To ensure that public versions of the approved business case are submitted to the Scottish Parliamentary library (SPICe) within 1 calendar month of their approval (or at a later date agreed by the CIG chair as soon as is practical thereafter).
- To monitor receipt of Post Project Evaluation and Post Occupancy Evaluation reports.
- To maintain a record of issues raised, lessons learned and actions taken during the CIG process

Project Evaluation

The CIG (with the assistance of the Health Finance and Infrastructure Division) will:

- Monitor completed projects, using a project tracker, to ensure the relevant NHSScotland Boards are complying with the Scottish Capital Investment Manual (SCIM) requirements for Project Evaluation.
- Check that an 'Evaluation Plan' has been included within the Full Business Case which sets out the plan for carrying out the Post Project Evaluation and Post Occupancy Evaluation.
- Monitor the submission of Project Completion Evaluation Reports, to be submitted on completion of the facilities and confirm that they provide an assessment of the success of the project.
- Monitor the submission of Post-Project Evaluations, to be submitted no later than 12 months after completion, and confirm that they provide an initial evaluation of the service and investment objective outcomes.
- Monitor the submission of Post-Occupancy Evaluations, to be submitted after completion in accordance with SCIM guidance, and confirm that they provide an assessment of the longer term service benefits and investment outcomes.
- Monitor the submission by each NHSScotland Board on an annual basis of a summary report for project evaluations for projects <£5m (and therefore not required to be submitted to CIG in full).
- Contribute to, and ensure that, the Scottish Government Health Finance and Infrastructure Division produce a 'key lessons' document annually, based on all project evaluations received.

Annex 2 - CIG Membership

Name	Position / Department	email / telephone number

EMBARGOED UNTIL DATE OF MEETING.

Greater Glasgow NHS Board

Board Meeting
Tuesday, 29th January, 2002 **Board Paper No. 02/02**
CHIEF EXECUTIVE

CONCLUDING THE DECISIONS ON GREATER GLASGOW'S ACUTE SERVICES REVIEW

1. Introduction

1.1 Finalising decisions about the future pattern of acute services provision for the city is a key strategic decision for the NHS Board. The current strategic proposals have been the subject of public debate for just under two years; two earlier reviews of acute services undertaken during the 1990s failed to deliver on agreed, affordable, city-wide plans for the major re-development of acute hospitals which is required in order to deliver facilities and services which are 'fit for purpose' for the 21st Century. Thus, some of the major investment made in new hospital buildings over that period - though necessary - has been decided without having in place a longer-term strategic plan for acute care in Greater Glasgow.

1.2 In recent months, there has been a growing frustration among a number of key stakeholders that no definitive decisions about the future of acute services have yet been taken. The opportunity exists now, therefore, for the NHS Board to conclude decisions about this strategy, and thus to give a clarity which will allow the detailed plans to be developed and implemented which will transform, within the next decade or so, the delivery of acute care within Greater Glasgow.

2. **The Need for Change**.

2.1 A number of pressures are impacting on the provision of acute services in Glasgow. The main problems associated with delivering Glasgow's acute services are:

- **Outdated buildings,** unsuitable and unfit for modern healthcare –21st century healthcare in 19th century buildings.
- **Inpatient sites** which are unable to provide the one stop / rapid diagnosis and treatment models for the large volumes of patients treated in Glasgow hospitals.
- **Fragmentation of care** as patients are required to move around sites and different buildings, an inevitable loss of continuity and difficulties in transferring information e.g. laboratory results and x-rays between sites.
- **Unsuitable diagnostic and imaging facilities** which restrict capacity, create bottlenecks and inevitable delays in treatment.

- **Increasing sub-specialisation in medicine** – a move towards larger teams to ensure all patients can get access to the appropriate specialist .

- **Glasgow's role in teaching and research** and the links with the Universities, is critical for the service to attract and retain high calibre staff - critical in services where there are national shortages e.g. cancer, cardiac surgery, diagnostic imaging and pathology amongst others.

- **Too many inpatient sites requiring emergency on call rotas** on each site –with pressures growing on both consultants and junior staff.

- **Changes in doctors' training** – means consultants are being called in from home more often, or opting to do *resident on –call to* provide support to junior staff.

- **Restrictions on the hours doctors can work**: New Deal for Junior Doctors limits number of hours; European Working Time Directive restricts availability of consultants due to compensatory rest requirements.

- **The policy imperatives** outlined in the policy papers The Scottish Health Plan and The Cancer Plan which include waiting list guarantees, reductions in waiting times, improved access to rapid diagnosis and treatment, the provision of services designed around the needs of patients and improved integration with primary and social care.

3. The NHS Board's Approach to Finalising Decisions on the Strategy

3.1 From 1st October, 2001, a new NHS Board has been in place, with a much larger complement of Non-Executive and Executive Directors than the previous Health Board comprised: no fewer than 11 additional Directors form part of the new NHS Board. During the past 3½ months, the NHS Board Directors have spent a number of development sessions on key strategic issues, including the strategy for acute services. The NHS Board wants to approach its decision-making as a board of governance.

3.2 In addition to these working sessions within the NHS Board, the Chairman, the Chief Executive and members of the Executive Team have undertaken seventeen briefing sessions on acute services during the past 7 weeks with a broad range of stakeholder interests: these have included MSPs, MPs, Glasgow City Council, the Greater Glasgow Health Council, the Area Medical Committee, the Area Clinical Forum and the Area Partnership Forum, the Medical Staff Associations in North and East Glasgow, and 3 public meetings in Springburn, Kirkintilloch and Langside. The NHS Board has received feedback from these discussions which has further helped to shape how it will consider this strategy at the meeting on 29th January.

3.3 In order to discharge this governance role, the NHS Board wishes to consider its decisions at three levels. First, as a new NHS Board, it wishes to be satisfied that the processes which led to the series of decisions taken in December, 2000, including the arrangements for public consultation and involvement, were appropriate. Secondly, the NHS Board wishes to be satisfied that the further work flowing from the Health Board's December, 2000 decisions has advanced to a point which allows strategic decisions to be taken now, recognising the need for more detailed on-going work as part of the development of Outline and Full Business Cases. Thirdly, the NHS Board members want to have the opportunity of hearing first-hand about new or different perspectives arising from the briefing meetings with stakeholders described above, with the facility given to specific interest groups to make presentations to the NHS Board meeting supported by short, written submissions. Thus, the agenda and papers for the meeting on 29th January have been structured to reflect these arrangements.

4. The Appropriateness of the Process Leading to Decisions by Greater Glasgow Health Board in December, 2000

4.1 The NHS Board wishes to approach its consideration of the series of decisions related to this strategy from a standpoint of governance. In order to ensure continuity in the Board's consideration of these matters, all previous papers related to the strategic decisions taken by Greater Glasgow Health Board have been made available to the extended complement of Directors who now form the NHS Board itself.

4.2 The paper included as Appendix 1 summarises the consultation processes undertaken during 2000\2001. This paper demonstrates that a substantial programme of consultation events and publications was worked through during a period of nine months. There was ample opportunity created for any individual or organisation interested in commenting on the Health Board's proposals to participate in the consultation process over that period of time.

5. Testing the Validity of the Preferred December, 2000 Decision on the Disposition of Acute Services.

5.1 The arguments covering the future pattern of acute hospital in-patient services were set out in detail in the March, September and December, 2000 Board papers. In considering its approach to deciding the future pattern of acute services, the NHS Board wishes to hear at first hand from those who supported the Health Board's preferred model but also from groups which have different perspectives. Arrangements for the NHS Board meeting on 29th January have been structured to reflect this through a series of short presentations, supported by a brief written submission from each interest group.

5.2 In this part of the meeting, the NHS Board is asked to consider this aspect of the Clinical Strategy with the help of the following presentations and papers:

i) The case for three sustainable in-patient units.

Presentation: Dr. W.G. Anderson, Medical Director, North Glasgow University Hospitals Trust .
Dr. B.D. Cowan, Medical Director, South Glasgow University Hospitals Trust.

Paper: Appendix 2

ii) The extensive arrangements for care to be delivered from Ambulatory Care Centres.

Presentation: Mr. D. Simpson, Consultant ENT Surgeon, Stobhill Hospital.

Paper: Appendix 3

iii) The perspective from Greater Glasgow Health Council.

Presentation: Mr. P.F. Hamilton, Convenor.

Paper: Appendix 4

iv) The perspective from the Medical Staff Association, Stobhill Hospital.

Presentation: Dr. J. Davis, Chair; Mr. J. Smith, Consultant Surgeon;
Dr. F.G. Dunn, Consultant Physician and
Mr. A. McMahon, Consultant Surgeon.

Paper: Appendix 5

v) A counter-proposal from the South-East Glasgow Health Forum.

Presentation: Professor D. McGregor and Mr. E. Canning.

Paper: Appendix 6

5.3 The NHS Board will wish to take account of all of these inputs, together with the papers available from previous Greater Glasgow Health Board meetings, in determining its broad Clinical Strategy.

[Decision 1: The NHS Board is asked to determine whether a Clinical Strategy, based on three adult in-patient sites, supported by two large Ambulatory Care developments, is the appropriate pattern for future years]

6. The Provision of Accident and Emergency, Trauma and Emergency Receiving Arrangements

6.1 The detailed arguments presented on this aspect of the Clinical Strategy were set out in full in March, September and December, 2000 Board papers. This section of the paper picks up the first of the elements of additional work which Greater Glasgow Health Board had instructed in order to test the deliverability of the preferred model for Accident and Emergency Services re-affirmed following consultation in the December, 2000 Strategy. In its submission, the Area Medical Committee supported the principle that Consultant led Accident and Emergency Services should be developed on two sites (viz the Southside Hospital and Glasgow Royal Infirmary) with acute medical and surgical receiving continuing at Gartnavel General Hospital. In making this recommendation, however, the Area Medical Committee sought assurances that its previously stated concerns about the additional workload which might ensue at Glasgow Royal Infirmary were being satisfactorily addressed in order to find agreed solutions with the Accident and Emergency staff and other key Clinicians involved.

6.2 In considering this key issue, the NHS Board has access to the following presentations and papers:

i) The benefits of two fully resourced A & E\Trauma Units, with emergency receiving undertaken in West Glasgow.

Presentation: Dr. T.J. Parke, Clinical Director, South Glasgow Trust; Dr. W.M. Tullett, Clinical Director, A & E Services, North Glasgow Trust; and Mr. S. McCreath, Clinical Director, Orthopaedic Services, South Glasgow Hospitals Trust.

Paper: Appendix 7

ii) The case for retaining Accident and Emergency and Orthopaedic Services in West Glasgow (and therefore having three fully resourced A & E\Trauma Units).

Presentation: Mr. K. A. Harden, General Practitioner.
Mr. J. Crossan, Consultant Orthopaedic Surgeon.

Paper: Appendix 8

6.3 The NHS Board will wish to consider all of these inputs and the associated discussion, together with the material available from previous Greater Glasgow Health Board meetings in determining this aspect of the Clinical Strategy.

[Board Decision 2: The NHS Board is asked to determine whether the provision of A & E and Trauma Care from 2 fully resourced A & E Centres, located in the North-East and South Glasgow, working with an Emergency Receiving Unit in West Glasgow, is the appropriate basis for the future delivery of Accident and Emergency care]

7. Bed Modelling and distribution of clinical specialties.

7.1 Further detailed work on this aspect of the Clinical Strategy was the second piece of additional work which Greater Glasgow Health Board had instructed following its decisions taken in December, 2000. An updated report is attached as Appendix 9.

[Board Decision 3: The NHS Board is asked to receive this status report on the work on bed modelling; to recognise that bed modelling and capacity planning will continue as a dynamic part of the development of the detailed Business Cases for the provision of new hospital facilities; and to entrust to the Bed Modelling Group a governance responsibility for the continuation and overview of this work]

[Board Decision 4: In addition, the NHS Board is asked to agree that a detailed paper, flowing from the decisions about the broad Clinical Strategy, which will set out the proposed distribution of clinical specialties by hospital site, will be brought to the NHS Board in February for adoption, subject to the outcome of a six week period of public consultation.

8. Assessing the Options Carried Forward from the December, 2000 Health Board Strategy Against the NHS Board's Adopted Clinical Strategy

8.1 In this section, the NHS Board is asked to determine which of the options which were carried forward from the December, 2000 Health Board Strategy are compatible with the Clinical Strategy which the NHS Board decides to adopt.

8.2 When Greater Glasgow Health Board took its strategic decisions in December, 2000, Three options for North-East Glasgow were under consideration: option one involved in-patients at Glasgow Royal Infirmary, with ambulatory care and minor injuries unit at Stobhill; option two involved moving away wholly from the Royal Infirmary site and re-providing all in-patient acute services at Stobhill; while the third option involved the "status quo" option, which forms the starting point for consideration of all business cases. In terms of the trail of governance, the affordability of the second of these options is shown in the affordability section of this paper.

8.3 In subsequent discussion within the North-East Reference Group, the option of moving away from the Royal Infirmary site was dismissed at an early stage as unrealistic. Accordingly, subsequent discussion has centred on four options within North-East Glasgow. These options were as follows:

Option 1

The Glasgow Royal Infirmary would be the in-patient hospital, with an Ambulatory Care And Diagnostic Centre and Minor Injuries Unit only at Stobhill. In west Glasgow, the Western Infirmary would close and Gartnavel General hospital would become the in-patient site with both core and specialist services. Gartnavel General would include a minor injuries unit and an acute medical receiving unit. In this option 40% of the current inpatient activity currently provided on the Stobhill site would transfer to Gartnavel General.

Option 2

Glasgow Royal Infirmary would serve as a specialist elective hospital for North and East Glasgow. It would provide no *core* clinical services e.g. general surgery/general medicine, no accident & emergency /trauma or orthopaedics. Stobhill Hospital would be developed as a District General Hospital with Accident and Emergency and an ACAD for the north and east of the city. In west Glasgow the Western Infirmary would close, with all services excluding Accident and Emergency to be provided at the redeveloped Gartnavel General Hospital.

Option 3

Glasgow Royal Infirmary retains its current role with all existing on-site specialties and Accident and Emergency. Stobhill would be a local hospital providing general medicine, general surgery, an ACAD, facility and a minor injuries unit. In west Glasgow the Western Infirmary would close, with all services excluding Accident and Emergency to be provided at the redeveloped Gartnavel General Hospital. In this option there is no assumption that additional clinical activity would transfer from Stobhill This option is based on refurbishment of both sites as opposed to new build.

Option 4.

As for option 3 above, but in new build accommodation at both GRI and Stobhill sites.

8.4 NHS Board will have heard the views from Stobhill Clinicians in the earlier part of the meeting.

[Board Decision 5: The NHS Board is asked to determine which options continue to meet the Clinical Strategy and are carried forward for consideration as part of the "affordability" section of this paper]

8.5 At December, 2000, Greater Glasgow Health Board's position in respect of options within South Glasgow was more clear cut. There had been a strong body of agreement that a single in-patient site represented the preferred option and that that site would either be a substantially re-built Southern General Hospital, or a "green field" new build hospital on sites at Cowglen. However, in its earlier consideration of Clinical Service Strategy, the NHS will have heard a counter-proposal in favour of two acute general hospitals in South Glasgow. Thus, the NHS Board will wish to take account of those earlier discussions in determining its Clinical Strategy prior to assessing which options fit that pattern of service delivery.

[Board Decision 6: The NHS Board is asked to determine which options meet the Clinical Strategy for service provision in South Glasgow and are thus carried forward for consideration as part of the "affordability" section of this paper.

9 The Affordability of the Clinical Strategy and of Individual Options; and a Potential Implementation Plan

9.1 The Director of Finance has prepared a detailed paper which sets out a broadly based approach to the affordability of this Strategy: it is attached as Appendix 10. In addition, this paper offers for the NHS Board's consideration some initial proposals about both the overall timescales for investment and a potential order within which major capital investment might be carried out.

9.2 In summary, the key points arising from this overview of affordability are as follows. For the next two financial years, the priority with the acute care sector is to ensure that financial deficits are eliminated, thus bringing the acute and paediatric sectors into recurring financial balance no later than 1st April, 2004. The NHS Board can begin to generate the revenue necessary to fund the revenue costs of a capital programme approaching £700M at that point.

9.3 The recent round of stakeholder discussions has brought a consistent reaction that any plan to effect this strategy which extends much beyond ten years will lack credibility. Indeed, a number of groups have expressed disappointment that the implementation plan will take so long, but the reality is that, given the need to take proper account of the commitments and development needs across each of the programmes of care on which the Board's approach to resource allocation is based, affordability cannot realistically be achieved more quickly. A second principal which has been applied to this implementation plan is that it should regenerate the acute services facilities in all three sectors of the City - South, North-East and West.

9.4 Following the "likely" funding stream available for investment in the Acute Services Review (Annex A, Table 1 in Appendix 10) - a scenario which will pose a substantial challenge in "protecting" new investment for this purpose - a cumulative total of £60.1M can be amassed by the year 2012\13 (year 11 from now). As the NHS Board is already committed to completing the second phase of relocating the Beatson Oncology Centre adjoining the Tom Wheldon Building at Gartnavel General Hospital, at an additional revenue cost of £4M to be met in early 2006\7, the balance of accumulated revenue available to meet the options for implementing the Acute Services Strategy in North and South Glasgow is £56.1M.

9.5 Against this cumulative sum of £56.1M, the costs of the combinations of options are as follows:-

a)	North (1) - In-patients at Glasgow Royal Infirmary; Ambulatory Care and Minor Injuries at Stobhill (£36.9M)	}
	South (1) - In-patients at Southern General; Ambulatory Care and Minor Injuries at Victoria Infirmary (£24.9M)	} £61.8M
b)	North (1) - In-patients at Glasgow Royal Infirmary; Ambulatory Care and Minor Injuries at Stobhill (£36.9M)	}
	South (2) - In-patients at Cowglen; Ambulatory Care and Minor Injuries at Victoria Infirmary (£33.7M) - based on occupancy achieved by 2008\9	} £70.6M
c)	North (2) - In-patient Services and Ambulatory Care at Stobhill (shown for governance purposes) (£45.2M)	}
	South (1) - In-patients at Southern General; Ambulatory Care and Minor Injuries at Victoria Infirmary (£24.9M)	} £70.1M
d)	North (2) - In-patients and Ambulatory Care at Stobhill (£45.2M)	}
	South (2) - In-patients at Cowglen; Ambulatory Care and Minor Injuries at Victoria Infirmary (£33.7M)	} £78.9M

* The estimated cost of the option which involves retaining core medicine and surgical in-patient beds at Stobhill is £41.9M.

9.6 The impact of this is that, at year 11, the lowest cost combination of options (North 1 and South 1) exceeds the cumulative total available by £5.7M. The option which would see in-patients for North-East Glasgow located at Glasgow Royal Infirmary, with a Southside in-patient development at Cowglen exceeds the sum available at year 11 by a minimum of £14.5M.

[Board Decision 7: The NHS Board is asked to determine which options it views as affordable to be carried forward to more detailed option appraisal, as part of Outline Business Case preparation]

10. Transport Implications

10.1 As part of the work following the December, 2000 Health Board decision, a survey was commissioned in order to assess the broader transport implications of the options which remained broadly under consideration. The detailed analysis which will flow from this survey will be of particular value in planning the implementation of the Strategy. There is attached at Appendix 11 a headline summary of the main strategic findings arising from the detailed accessibility study which has been commissioned. When the shape of the Clinical Strategy has been determined, the transport implications will form an important part of the implementation programme in the years ahead.

12.1 **Next Steps in taking the Strategy forward**

i) Formal submission to the Scottish Executive Health Department, the Minister for Health and Chief Executive of NHS Scotland, including papers previously considered by Greater Glasgow Health Board.

ii) An early meeting will be arranged with the Chief Executive of NHS Scotland, the Director of Finance and members of the Executive Team in order to agree the arrangements for progressing the supporting Business Cases.

iii) A detailed paper will be brought to the NHS Board to take forward and finalise consideration necessary for the distribution of specialties between individual hospital sites.

12.2 The NHS Board will return shortly to the further work required to conclude Strategies for Child Health and Maternity Services.

EMBARGOED UNTIL DATE OF MEETING.

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From: Roy G (Glenda)
To: Martin P (Paul); Connaghan J (John); Rhodes P (Paul); Brennan C (Claire)
Subject: FW: *URGENT* New South Glasgow Hospitals - Outline Business Case
Date: 21 February 2008 09:41:55
Attachments: New South Glasgow Hospitals - Outline Business Case - February 2008.obr
New South Glasgow Hospitals - Outline Business Case - February 2008 - appendices.obr
New South Glasgow Hospitals - Outline business Case - comments table.obr
Importance: High

Good morning

Apologies in advance that you did not receive a copy of me earlier e-mail. I only found out you were to receive a copy this morning.

As requested below I would be grateful if you could provide comments on the business case below bearing in mind it is HIGH PRIORTY.

Many thanks

Glenda Roy
Property and Capital Planning Division

[redacted]

-----Original Message-----

From: Roy G (Glenda)

Sent: 18 February 2008 11:42

To: Baxter M (Mike) (Health); Kinnear N (Norman); Hastie D (David); Tither S (Stephen); Marshall M (Marjorie); Welsh J (Joe); Sheriff C (Carmel); Watson AS (Alexandra) (Health Department); Armstrong J (Jennifer); Smith L (Louise) Dr

Cc: McGregor C (Christine); Haggarty P (Phyllis)

Subject: *URGENT* New South Glasgow Hospitals - Outline Business Case

Importance: High

Good morning

Please find attached a copy of the Outline Business Case and appendices for the New South Glasgow Hospitals.

Please note that this is a high profile case. DG Health regularly keeps the Cabinet Secretary informed of it's progress and its envisage that it will be discussed by the Cabinet early March (although it's not timetabled as yet). The business case will be discussed at CIG on 26th February with a view to being considered through expedited procedures prior to 5th March. I would therefore be grateful if you could enter any comments, including nil responses, into the attached comments table **before Monday 25th February.**

Many thanks

Glenda Roy
Property and Capital Planning Division

[redacted]

From:	Creevy P (Peter) on behalf of Minister for Public Health
To:	Cabinet Secretary for Rural Affairs and the Environment; Cabinet Secretary for Finance and Sustainable Growth; Cabinet Secretary for Education and Lifelong Learning; Minister for Parliamentary Business
Cc:	Cabinet Secretariat inbox; Baxter M (Mike) (Health); Brown AM (Alistair); Davidson J (Jane); Smith A (Alex); DG Health; Hastie D (David); Minister for Communities and Sport; Permanent Secretary; Foster A (Angiolina); Connaghan J (John); Dolan N (Noel); Communications Health and Wellbeing; Pringle K (Kevin); Logan J (Joe)
Subject:	URGENT: PRE CABINET CONSIDERATION - DRAFT CABINET PAPER - PROPOSED NEW SOUTHERN AND CHILDREN"S HOSPITAL PROJECT, GLASGOW
Date:	25 March 2008 12:50:57
Attachments:	New Southern Pre-Cabinet - Final Draft - IPQ.DOC New Southern Cabinet Paper - final draft - IPQ#2.doc

PS/Cabinet Secretary for Finance and Sustainable Growth
PS/Cabinet Secretary for Education and Lifelong Learning
PS/Cabinet Secretary for Rural Affairs and the Environment
PS/Minister for Parliamentary Business

Copy as above

PRE CABINET CONSIDERATION – DRAFT CABINET PAPER - PROPOSED NEW SOUTHERN AND CHILDREN'S HOSPITAL PROJECT, GLASGOW

Please find attached minute from Shona Robison and draft Cabinet Paper regarding the proposed new Southern and Children's Hospital Project in Glasgow. This will be discussed at Cabinet on 8 April.

Timing is Urgent as comments required by close on **Friday 28th March**.

Thanks

Peter Creevy
PS/Minister for Public Health

[redacted]

[redacted]

Minister for Public Health
25 March 2008

Cabinet Secretary for Finance and Sustainable Growth
Cabinet Secretary for Education and Lifelong Learning
Cabinet Secretary for Rural Affairs and the Environment
Minister for Parliamentary Business

PRE-CABINET CONSIDERATION PROPOSED CABINET PAPER – PROPOSED NEW SOUTHERN AND CHILDREN'S HOSPITAL PROJECT, GLASGOW

Purpose

1. I attach for your comments a draft Cabinet paper which seeks Cabinet approval for the above project to proceed, to secure the required capital funding required for the project within the context of the overall Health capital budget requirements and agree to proposed handling.

Priority

2. **Urgent**. The paper is provisionally on the Cabinet agenda on 8 April. I would appreciate any comments you have by **close on Friday 28th March.**

Background

3. NHS Greater Glasgow and Clyde had their Acute and Related Services Review approved in 2002 by the then Minister for Health and Community Care. Since that time the NHS Board have been progressing plans to reconfigure the nature of services. The first phase involved three major capital developments. These were the new West of Scotland Cancer Centre at Gartnaval Hospital which opened in 2007 and the two new Ambulatory Care Hospitals at Stobhill and Victoria which are currently in construction and due to open in summer/ 2009. The New Southern Hospitals project being considered is pivotal to the delivery of the overall strategy and will completely redevelop the Southern General Hospital and also provide a new state of the art Children's Hospital for the West of Scotland.

4. At a total capital cost of £842m, **the New Southern Hospitals Project represents the biggest building project in the history of NHSScotland.** It is vital therefore that the development is deliverable, affordable, sustainable and represents best value for money for the taxpayer.

5. The Executive Summary of the Outline Business Case for the project, which sets out the purpose and approach to delivering the project, is attached as Annex A to the paper.

Discussion

6. The business case for the project has been approved by both the NHS Greater Glasgow and Clyde and the Scottish Government Health Directorate's Capital Investment Group following a full review of all aspects of the Outline Business Case. That analysis comprised service planning, clinical modelling through to value for money, affordability and governance.

7. In delivery terms, the Board has conducted a robust value for money assessment of the service options to identify the basic infrastructure investment required. That assessment has been reviewed by both the Board's external advisers and by Government economists as part of the Capital Investment Group review. In terms of governance, the project was subject to Gateway Review prior to submission of the Outline Business Case to the NHS Greater Glasgow and Clyde Board on 19th February 2008.

8. Following identification of the preferred service option a value for money and affordability analysis comparing a public capital option against a Non Profit Distributing (NPD) PPP model was undertaken. The results showed a negligible margin between the two routes and therefore in value for money terms either route could be justified. In affordability terms however, given the impact of resource accounting and budgeting, the impact of the two routes is markedly different with the additional revenue costs of the public capital option amounting to £53.8m per annum against the £76m per annum for the NPD route. For no additional vfm benefit, the NPD route would require an additional £22m of service savings to be achieved.

9. The preferred funding route is therefore use of public capital. The phasing of expenditure and the relevant contributions is shown in the Table 1 below:

Table 1 Phasing and Funding Requirements for New Southern Hospitals Project (£m's)

	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	TOTAL
NHS GG&C capital and receipts	10	40	50	55	48	48	19	**270**
Endowments			10	10				**20**
Scottish Government	18	101	176	170	95	11	(19)	**552**
TOTAL	**28**	**141**	**236**	**235**	**143**	**59**	**-**	**842**

10. Of the total requirement of £842m NHS Greater Glasgow and Clyde have identified £135m from within their own formula based capital resources and £135m generated through capital receipts. A further £20m will also be provided through local endowment funding. The balance of funding required is therefore £552m The previous Administration had already committed £130m of public capital towards the cost of the New Children's Hospital leaving a net additional funding requirement of £422m.

11. The required capital contributions from Scottish Government and NHS Greater Glasgow and Clyde to cover the initial planning and first stages of construction in 2009-10 and 2010-11 are contained within the agreed SR07 Health and Wellbeing capital baseline. The bulk of the capital spend as shown above falls in the following spending review period from 2011-12 to 2013-14. To assess the impact of this project on the Health and Wellbeing capital budget, the 2010-11 Health Net Capital Budget of £597.7m has been used as a baseline.

12. Factoring in the level of Scottish Government support required (shown in Table 1) together with existing commitments to NHS Lanarkshire (£100m), NHS Ayrshire and Arran (£30m), projected funding requirements for the main phases of the redevelopment of Aberdeen Royal Infirmary and Dumfries and Galloway Royal Infirmary the total capital requirement for Health over the 2011-12 to 2013-14 period is £730m/ £745m/£670m.

13. This is an additional £351m over the 2010-11 baseline for a three year period. To offset this additional requirement in the SR10 period it is proposed to reduce the Health capital requirement in the SR13 period to £550m/£500m/£501m. This is equivalent to a reduction of £243m on a recurrent baseline of £598m for three years. The net additional capital requirement over 6 years is therefore £108m.

14. This paper touches on your respective portfolio interests in a number of ways:

    a. **Finance and Sustainable Growth: Financing requirements for the project (paragraphs 13-19)**
    b. Parliamentary Business: Announcement of decision by means of Arranged PQ (paragraph 20 and 22)
    c. Cabinet Secretary for Rural Affairs and the Environment (general interest)
    d. **Education and Lifelong Learning: Development of State of Art Children's Hospital (paragraph 4)**

15. As this is a constituency matter for the Cabinet Secretary for Health and Wellbeing I will be presenting this issue at Cabinet. It is proposed that an announcement would be made through an Inspired PQ.

Conclusion

16. I should be grateful to know **by close of play on Friday 28th March** that you are content for me to submit the attached paper to Cabinet for approval.

SR
March 2008

Copy List:	For Action	For Comments	For Information		
			Portfolio Interest	Constit Interest	General Awareness

Permanent Secretary
DG Economy
DG Education
DG Health
DG Justice
DG Environment
Graeme Dickson, Director Health Primary care
Alex Smith, Director Health Finance
Alyson Stafford – Finance Director
Sandy Rosie, FPU
PS/Solicitor
Sarah Davidson – Head of Cabinet Secretariat
Jan Marshall – Constitution & Parliamentary Secretariat
Lynda Sawers – UK Liaison Team
Elspeth Hough- Cabinet Secretariat
Stephen Noon – Senior Policy Adviser
Noel Dolan – Policy Adviser
Kevin Pringle - Senior Special Adviser
Strategy and Delivery Unit
Cabinet Secretariat Inbox
Communications Finance and Sustainable Growth
Communications Education and Lifelong Learning
Communications Health and Wellbeing
Communications Justice
Communications Rural Affairs and the Environment

RESTRICTED

FOR DECISION **Paper number:**

SCOTTISH CABINET

NEW SOUTHERN AND CHILDREN'S HOSPITAL PROJECT, GLASGOW

PAPER BY THE MINISTER FOR PUBLIC HEALTH

Purpose

1. This paper invites Cabinet:

- to agree to the approval of the Outline Business Case for an integrated Children's and Adult Hospital and a new laboratory on the site of the current Southern General Hospital, Glasgow and that the NHS Board proceed to procurement; and
- to agree to the provision of required additional capital resources totalling £108m over 6 years; and
- to note the presentational arrangements.

Timing

2. This paper is provisionally scheduled to be discussed at Cabinet on 8 April. A decision is required now to approve the Outline Business Case and enable the Project to proceed to procurement. Key stakeholders are aware that this matter is being considered by the Government and are anxious to know, following consideration by the NHS Board on 19th February, whether the Government is to support the project going forward. In financial terms, given the projected total capital cost of £842m, a delay of a month in delivery equates to an additional cost of £5-6m simply through construction inflation.

Background – Factual Information and Analysis

3. NHS Greater Glasgow and Clyde had their Acute and Related Services Review approved in 2002 by the then Minister for Health and Community Care. Since that time the NHS Board have been progressing plans to reconfigure the nature of services. The first phase involved three major capital developments. These were the new West of Scotland Cancer Centre at Gartnaval Hospital which opened in 2007 and the two new Ambulatory Care Hospitals at Stobhill and Victoria which are currently in construction and due to open in summer/ autumn 2009 respectively.

4. The New Southern Hospitals project being considered is pivotal to the delivery of the overall strategy and will completely redevelop the Southern General Hospital and also provide a new state of the art Children's Hospital for the West of Scotland.

5. **At a capital cost of £842m, the New Southern Hospitals Project represents the biggest building project in the history of NHSScotland. It is vital that the development is deliverable, affordable, sustainable and represents best value for money for the taxpayer.**

Advice to Ministers

6. Following identification of the preferred service option (consistent with the Service strategy agreed in 2002 and subsequent recommendations of the Calder Group on Children's and Maternity Services) through an option appraisal process the options for delivering the project have been appraised.

7. A rigorous value for money and affordability analysis was conducted comparing a public capital option against a Non Profit Distributing (NPD) PPP model. The results of this analysis showed a negligible margin between the two routes and therefore, in value for money terms, either funding route could be justified.

8. In affordability terms however, given the impact of resource accounting and budgeting, the impact of the two routes is markedly different with the additional revenue costs of the public capital option £53.8m per annum against the impact of £76m per annum for the NPD route. In other words use of the NPD route would require an additional £22m of service savings to be achieved with no additional value for money benefit.

9. A publicly funded capital route offers the potential to deliver an affordable solution within the context of the Board's financial plan for the 10 year period to 2017/18. The funding implications of this are considered at paragraphs 13 – 19 below.

10. In delivering the project the Scottish Government will wish to be assured that NHS Greater Glasgow and Clyde are managing the risks associated with the project and that the project is delivered on time and on budget. The Board are currently assessing the options for a detailed procurement strategy. It has already been recognised that there is a need to embed the disciplines associated with a PPP procurement on delivery whilst using a public capital funding solution.

11. As part of both the Gateway Review process and the Health Directorate's Capital Investment Group consideration it is recognised that there is a clear need for external challenge within the governance arrangements for the project. It is proposed to make such external representation on the Project Board a condition of approval for the project.

Legal Considerations

12. The proposals in this paper raise no legal implications.

Financial Implications

13. The project has an implication for the overall capital requirement for the Health and Wellbeing portfolio over the period 2011-12 to 2013-14. The project is being developed and delivered on a revenue neutral basis. The phasing of expenditure and the relevant contributions is shown in the Table 1 below:

Table 1 Phasing and Funding Requirements for New Southern Hospitals Project (£m's)

	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	TOTAL
NHS GG&C capital and receipts	10	40	50	55	48	48	19	**270**
Endowments			10	10				**20**
Scottish Government	18	101	176	170	95	11	(19)	**552**
TOTAL	**28**	**141**	**236**	**235**	**143**	**59**	**-**	**842**

14. Of the total requirement of £842m NHS Greater Glasgow and Clyde have identified £135m from within their own formula based capital resources and £135m generated through capital receipts. A further £20m will also be provided through local endowment funding. The balance of funding required is therefore £552m The previous Administration had already committed £130m towards the cost of the New Children's Hospital leaving a net additional funding requirement of £422m.

15. The required capital contributions from Scottish Government and NHS Greater Glasgow and Clyde to cover the initial planning and first stages of construction in 2009-10 and 2010-11 are contained within the agreed SR07 Health and Wellbeing capital baseline. The bulk of the capital spend as shown above falls in the following spending review period from 2011-12 to 2013-14. To assess the impact of this project on the Health and Wellbeing capital budget, the 2010-11 Health Net Capital Budget of £597.7m has been used as a baseline.

16. Factoring in the level of Scottish Government support required (shown in Table 1) together with existing commitments to NHS Lanarkshire (£100m), NHS Ayrshire and Arran (£30m), projected funding requirements for the main phases of the redevelopment of Aberdeen Royal Infirmary and Dumfries and Galloway Royal Infirmary the total capital requirement for Health over the 2011-12 to 2013-14 period is £730m/ £745m/£670m.

17. This is an additional £351m over the 2010-11 baseline for a three year period. To offset this additional requirement in the SR10 period it is proposed to reduce the Health capital requirement in the SR13 period to £550m/£500m/£501m. This is equivalent to a reduction of £243m on a recurrent baseline of £598m for three years.

18. The net additional capital requirement over 6 years is therefore £108m. Table 2 below demonstrates the overall phasing of required capital resources:

	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Total Health Capital Requirement	£730m	£745m	£670m	£550m	£500m	£501m
Difference from 2010-11 Capital Baseline (£598m)	+£132m	+£147m	+£72m	-£48m	-£98m	-£97m

19. In testing the affordability of a new service commitment of this scale, the Board has required to prepare a 10 year forward financial plan which examines the movements in both funding and expenditure which it is likely to face over this time period. In doing so, it has identified and assessed the key areas of risk which could impact on its financial projections, and reviewed its capacity for mitigating these through management action. On the basis of this analysis, the Board is able to conclude that the proposal which is contained within this OBC is affordable.

Parliament

20. It is intended to announce the approval of the Outline Business Case by means of an Inspired PQ. Given the project is within the constituency of the Cabinet Secretary for Health and Wellbeing, the answer will be provided by the Minister for Public Health.

Presentation

21. It is proposed to make the announcement through an Arranged PQ. This will allow greater flexibility regarding the time and date of release. We would propose that this is done early in the chosen week, Monday or Tuesday. A news release will be issued following the publication of the PQ, and the timing of the PQ could coincide with a visit by the Minister/ Ministers to the proposed site.

Publication

22. In accordance with extant guidance a copy of the Outline Business Case will require to be lodged with SPICe within one month of approval. At this stage some financial data will be redacted in order to protect NHS Greater Glasgow and Clyde's commercial position entering procurement. An full version of the OBC will be released following conclusion of negotiations.

Timetable

23. The timetable we shall be working to is set out below.

Description	Target Date
Outline Planning Approval	January 2008
Gateway Review	January 2008
Final OBC to NHS Greater Glasgow & Clyde Board	19th February 2008
Final OBC considered by Scottish Government Capital Investment Group	14th March 2008
Submit OBC to Cabinet	8th April 2008
Notification of OBC Approval	By end April 2008
Full Business Case Submission	2nd quarter 2010
Construction Starts	2nd quarter 2010
Completion – Children's Hospital	1st quarter 2013
Completion – Acute Hospital	2nd quarter 2014

Consultation

24. [I have consulted the Cabinet Secretary for Finance and Sustainable Growth, Cabinet Secretary for Justice, Cabinet Secretary for Rural Affairs and Environment and Cabinet Secretary for Education and Lifelong Learning and comments received have now been taken into account in the version of the Plan which accompanies this paper.]

Conclusion

25. Cabinet is invited to:

a. agree to provide the required net additional capital funding of £108m over 6 years to support the project (paragraph 18) ; and

b. agree that approval be given to NHS Greater Glasgow and Clyde to proceed to procurement; and

c. agree the proposals regarding presentation of the decision (paragraph 21).

ANNEX A

NHS GREATER GLASGOW AND CLYDE OUTLINE BUSINESS CASE EXTRACT

1. EXECUTIVE SUMMARY

1.1 INTRODUCTION

The purpose of this Outline Business Case (OBC) is to present proposals for the development of an integrated Children's and Adult Hospital and a new laboratory build on the site of the current Southern General Hospital.

The proposals represent the largest investment in health services undertaken in Scotland and form a major part of NHS Greater Glasgow and Clyde's Acute Services Strategy to modernise health services.

This investment will transform the experience of healthcare for patients and staff alike with Glasgow becoming the home to the largest, most advanced single NHS development delivering gold standard hospitals on the Southern campus.

A jewel in the crown of NHS Scotland, the new hospital campus will provide maternity, paediatric and adult acute services together on the one site. This will ensure immediate access to specialist services of all kinds and therefore the highest quality and safety standards for adults, children and babies alike.

The construction of the new hospitals will give opportunity to redesign radically the way in which health services are delivered and reappraise the skills and profile of the workforce tailoring delivery of modern health services in keeping with the 21st century.

The entire campus will have excellent transport links. Plans under discussion may include a Fastlink public transport system from the city to Braehead – which will take staff and visitors to and from all the main entrances within the hospital complex. New car parks will create more spaces bringing the total number of spaces from the current 1400 to around 3500.

As one of the largest single investments in the south of the city the development has the potential to regenerate and breath new life into Govan and the wider area. Liaison is taking place with Scottish Enterprise and a number of other external organisations to establish a New Hospitals Engagement Forum to realise this potential and bring added value to the new hospitals project.

The Health Board has been engaging with the Scottish Government to agree the format and content of the Outline Business Case, the outcome is reflected within this document.

1.2 THE CASE FOR CHANGE

NHS Greater Glasgow & Clyde recognise the need to ensure that patients who require access to hospital care can be seen, fully investigated and treated as quickly as possible within the appropriate facilities. For patients presenting as an emergency there should be access to specialised care of the highest quality, with access to state of the art investigations and treatment facilities on a 24 hour /7days a week basis. For elective care, patients should be seen, investigated and leave the hospital with a diagnosis and treatment plan wherever possible on the first visit. Underpinning this should be effective information and computer systems which allow GPs, Specialists and patient access to all relevant information needed to deliver high quality and effective patient care.

In 2002 Greater Glasgow Health Board described the case for change, which identified that the status quo was not an option, as there was significant challenge to the sustainability of the configuration of services and to the ability to improve patient pathways and create more efficient and effective care pathways. All of the factors identified remain relevant today with additional challenges and pressures resulting in even greater need to reduce hospital sites and duplication of services. In brief the issues are:

- The need to achieve the objectives of the guidance in 'Better Health, Better Care' and other key national policies. These policies drive reductions in waiting times; fast track access to rapid diagnosis and treatment; provision of services designed around the needs of the patient; modernisation of healthcare through better use of technology and improved integration with primary and social care reducing inequalities in health. To achieve these objectives a major programme of investment in buildings, information technology and redesign of services is required.
- Fragmented services, there is a requirement for patients to move within and around sites and different buildings with an inevitable loss of continuity of patient care, important co-locations of services are not possible and difficulties arise in transferring information between services.
- Increasing sub-specialisation in medicine and surgery and an increasing need to move towards larger teams to ensure all patients can access the appropriate Specialist on a 24hours a day and 7 days a week basis.
- Pressures on staff in sustaining appropriate staffing levels, for example Modernising Medical Careers and the European Working Time Directive impact upon the availability of medical staff and therefore on the sustainability of multiple rotas.
- Outdated buildings unsuitable and unfit for modern healthcare offering a poor patient environment with unsuitable facilities for modernising services, restricting capacity and creating bottlenecks and delays in treatment.

1.3 ACUTE SERVICES REVIEW (ASR)

The health services in Glasgow have entered a period of dramatic and exciting change. Following a decade of planning and public consultation, proposals to modernise the acute health services in Glasgow were approved in 2002 by Malcolm Chisholm, Minister for Health and Community Care.

The components of the acute service strategy are as follows:

- A new Beatson West of Scotland Cancer Centre at the Gartnavel General site (2008).
- Two Ambulatory Care and Diagnostic Hospitals on the Stobhill site and on a site adjacent to the Victoria Infirmary site, this will support the future reduction from 6 to 3 adult inpatient sites.
- A reduction in Maternity services from three sites to two, those being the Princess Royal Maternity Hospital at Glasgow Royal site and the redeveloped maternity facility on the new southern campus.
- In North Glasgow, acute in-patient services will be provided from Glasgow Royal Infirmary and Gartnavel General Hospital.
- In South Glasgow, acute in-patient services will be provided from a major new development at the Southern General Hospital.
- Full A&E services will be provided from two sites, located at Glasgow Royal Infirmary and the Southern General Hospital.
- Trauma and Orthopaedic in-patient services will be provided from the two full A&E sites. Orthopaedic out-patient and day case services to be provided from all five adult sites (Gartnavel, Stobhill, GRI, Victoria and Southern General).
- Minor Injury Units will be provided from all five adult sites.

In 2004 the Minister for Health and Community Care announced that the Scottish Government would provide £100 million to enable a new children's hospital to be built on a site which would support the "triple co-location of services". The Royal Hospital for Sick Children is currently co-located with the Queen Mothers Hospital (QMH). The planned closure of the QMH, and the transfer of its activity and services to the Southern and Glasgow Royal sites, will leave the Royal Hospital for Sick Children (RHSC) isolated. Following an option appraisal in 2005, of potential locations for the new children's hospital, the Southern General site was identified as the only location to offer both co-location with maternity and adult services and appropriate vacant land for building. This process was undertaken in collaboration with a Ministerial Advisory Group chaired by Professor Andrew Calder. The report of that Group, published in March 2006, affirmed the selection of the Southern General site as the location for the new children's hospital. This recommendation was accepted by the Minister for Health and Community Care in 2006 following a period of consultation.

A review of laboratory services was carried out to identify the optimal configuration of laboratory services in Glasgow to support the Acute Services Strategy. The preferred option involves: centralising the majority of laboratory services into two main sites at Glasgow Royal and the Southern site; consolidating immunology, tissue typing, stem cell lab work and all other laboratory services associated with leukaemia research and Haemato-oncology onto the Gartnavel site co-location with the West of Scotland Cancer Centre; and finally centralising pathology and genetics services onto a single site near the Southern Campus.

The process to transform acute hospital services across the city is well underway with the opening of the new West of Scotland Cancer Centre in 2007 and construction of two, state of the art, Ambulatory Care Hospitals (ACH) at the Victoria and Stobhill sites. The ACH's will be commissioned over the period late 2007 to summer 2009, which will result in not only significant modernisation of Glasgow's healthcare facilities and creation of single centres of excellence but will also result in 4 of Glasgow's major adult hospital sites operating below capacity.

This document describes the scheme which forms the second phase of the Acute Strategy, this involves the development of the new South Glasgow Hospital campus which not only sees the single biggest phase of modernisation and rationalisation of our adult clinical services, but incorporates the creation of a new Children's Hospital for the Greater Glasgow and West of Scotland populations and the completion of the modernisation of Glasgow's Maternity Services.

On completion of the development of the new adult hospital in 2014, the Board will be able to enact the following:

- inpatient services in the Victoria Infirmary to transfer to the new development thus vacating the Victoria Infirmary site;
- inpatient services at the Mansion House Unit (MHU) to transfer allowing closure of the MHU;
- inpatient services housed in outdated buildings on the southern site to be relocated;
- transfer of Accident and Emergency services and associated beds at the Western Infirmary enabling closure of the Western Infirmary.

By 2014, following some major refurbishment and new build works within existing estate at Glasgow Royal Infirmary and Gartnavel General Hospital, sufficient capacity will be created, following the opening of the new South Glasgow Hospital, to allow the 3 site inpatient configuration of adult services to be implemented, therefore also allowing the rationalisation of the inpatient services from Stobhill to Glasgow Royal Infirmary by no later than 2014.

Phase 3 of the Acute Services Strategy sees the major redevelopment and modernisation of the Glasgow Royal Infirmary campus and this work will be developed with a view to being brought forward for funding consideration in the period beyond 2015 followed by the final phase, which would see the redevelopment and modernisation of the retained adult inpatient services required on the Gartnavel General Hospital campus undertaken.

1.4 PROPOSED FUTURE SERVICES

1.4.1 Adult and Children's Services

Adult New Build

A 1,109 bedded adult new build acute hospital is planned. This will provide A&E services and acute specialist in-patient care, a small volume of medical day cases and out-patient clinics serving the local population. No day surgery will be undertaken as this will be provided by the New Victoria Hospital.

New Children's Hospital

The proposed new 240 bedded children's hospital will provide A&E services and a comprehensive range of inpatient and day case specialist medical and surgical paediatric services on a local, regional and national basis. The new development will also have outpatient facilities. The Health Board's strategy is that all Glasgow's Children's Services (up to the age of 16 and up to 18 years where appropriate) will be provided at the New Children's Hospital.

The planned number of beds for the adult and children's hospitals are shown below:

Adult Hospital	
Specialty	***Beds***
General Medicine (including MHDU)	407
Haematology	14
Dermatology	18
Nephrology (incl surgery)	80
Geriatric Medicine	93
CCU	18
ITU	20
SHDU	23
General Surgery & Vascular	169
Urology	51
Orthopaedic & Ortho Rehab	141
ENT	37
Clyde Beds *	38
Total In-patient Beds	1,109

Children's Hospital	
Specialty	***Beds***
In-patient (including critical care areas)	193
Short-stay (emergency receiving)	20
Day Care/Day Investigation	27
Total	240

* Clyde Beds
In line with the South of the River Strategy for Clyde, consulted and agreed on during 2006/07, the in-patient bed requirements for the following services have been included within the bed model for the new South Glasgow Adult Hospital – Vascular Surgery, ENT, Dermatology and Haematology.

1.4.2 New Laboratory Build

The proposed New Laboratory build will provide biochemistry, haematology blood transfusion and mortuary services.

1.1.1 1.4.3 Retained Services

The Southern site will retain approximately 630 beds within the Institute of Neurological Services, Maternity, Spinal Injuries and Langlands buildings. The Langlands facility provides older people's services and also services for the young physically disabled.

1.4.4 Future Service Changes

At the time of undertaking the latest bed modelling exercise for the ASR it was recognised that there might be future changes to bed numbers as the result of changes to regional services provision such as neurosciences, oral-maxillofacial services, renal services, gynae-oncology services. With the exception of renal services, which has already been factored into the new South Glasgow Adult Hospital's bed model other potential changes to requirements in relation to beds do not affect the new South Glasgow Adult Hospital's current proposals.

1.5 EXPECTED BENEFITS OF THE PROJECT

It is anticipated that the proposals set out in this business case will deliver a range of benefits for patients. These are as follows:

- Provision of high quality services which are timely, accessible and consistently available by providing local access to core medical and surgical services and consolidating specialist and tertiary services on fewer sites within the city.
- Investment in high tech equipment and Information Technology
- Attention to design and landscaping to improve the patients overall care
- Fully accessible to all and DDA compliant (Disability Discrimination Act.)
- Reduced waiting times for treatment through the provision of more efficient services increasing clinical capacity by investment in Information Technology (IT), the concentration of clinical teams onto fewer sites, optimising departmental and functional relationships and improving access to diagnostic services such as laboratory services.
- Access to highly specialised steams provided by skilled staff facilitated through the centralisation of services.
- Rapid, one stop services through high volume processing of diagnostic tests and an extended working day to fit in with new models of care.
- Protection of elective workload from disruption by emergencies thereby improving the efficiency of the service and reducing the number of cancellations.
- Enhanced staff skills and knowledge through improved retention and recruitment due to a radically better working environment
- Modern, fit for purpose facilities which meet the needs of patients, visitors and staff

- Enhanced University links through co-location of an academic centre with the new hospitals on the Southern General Campus. This will enhance teaching, and research and play a significant role in attracting and retaining high quality staff in all disciplines.

It is also recognised that the proposed new builds on the Southern site could contribute substantially to the local Govan economy and the wider area.

A social economic benefits analysis was carried out by SQW Consultants, funded by NHS Greater Glasgow NHS in partnership with a number of other contributors including Scottish Enterprise and Glasgow City Council.

The analysis looked at the potential impact on the immediate area around the Southern General site, the wider city of Glasgow and the Glasgow Metropolitan City Region. The analysis identified potential benefits within the following categories: economic, human and social, knowledge (e.g. research and development) and place.

In brief SQW has estimated that the future service configurations on the Southern General site will have a combined direct, indirect and induced economic impact of between £30 and £40 million on the South West Glasgow economy; between £110 and £140 million on the city economy and between £240 and £290 million on Glasgow city region by 2012/13. The new builds will also contribute to opportunities for training and employment and the development has the potential to support collaboration between academic, public and private sector partners to realise opportunities in research and development, bio-medical and life sciences.

In conclusion, the Southern General development is seen as a catalyst for wider social and regeneration activity contributing to the creation of higher aspirations for the physical development of the local area.

1.6 OPTION APPRAISAL – SITE AND DESIGN OF NEW SOUTH GLASGOW AND NEW CHILDREN'S HOSPITALS

1.6.1 Greenfield Option

For purposes of comparison for the Outline Business Case the option of building the new hospitals on a Greenfield site was revisited. This confirmed the outcome of the 2002 review, during which this option was first explored and dismissed because of high cost.

1.6.2 New Southern General Campus Options

Site

In thinking about the optimum site on the Southern General Campus for the New South Glasgow and New Children's Hospitals a key criterion has been the need to physically link the new hospitals to the Maternity and Neurosciences buildings. This will allow ready access to a range of paediatric services for foetus in utero or new born babies and mothers access to critical care and other acute services. An area which lies between the Maternity and Neurosciences buildings has therefore been designated for the construction of the new Hospital to allow these links.

Separate or Integrated Hospital Builds

In comparing options to build the new hospitals separately or together as an integrated build, the latter, an integrated build, was considered to offer more benefits, less risk, increased deliverability and lower cost. A further option appraisal took place involving NHS stakeholder input to identify the optimum design solution for the integrated build. An exemplar design was then developed involving input from a wide range of users.

Supporting/Associated Developments and Works

In addition to the new Adult and Children's Hospitals and Laboratory facility there are series of associated developments and works. For the purposes of the Outline Business case two options around the Southern General site have been developed, these are option 1 with a higher percentage of new build associated developments and option 1a utilising more of the existing estate.

1.6.3 Benefits Appraisal

A benefits appraisal exercise was undertaken looking at the Greenfield site, Option 1 and Option 1a. The benefits criteria were derived from the project objectives. The criteria were weighted and scored against each of the options. The appraisal of the options produced scores within a very tight band, those options involving an increased percentage of new build producing slightly higher scoring.

1.7 LABORATORY SERVICES

A Glasgow wide review of laboratory services identified centralisation of the majority of laboratory services on the Southern General site and Glasgow Royal site as the optimum configuration to support the Acute Services Strategy.

A new build laboratory facility is planned for the Southern General site housing haematology, biochemistry and mortuary services. The laboratory will be located alongside the new hospitals linked via an underground tunnel.

The new build will support the New Adult and Children's Hospitals and other services south of the city. The planned model for the new laboratory development will be one of high volume processing of tests with use of automation and up-to-date integrated IT systems with extended day and 24/7 working to reflect the new patient care models.

1.8 FINANCIAL ANALYSIS

The capital cost of the proposal to provide New Adult and Children's Hospitals on the Southern General site is forecast to be £841.7m (Option 1a, 100% single rooms).

It is proposed to fund this following a public capital procurement route, combining £270m of capital resources sourced from the Board's general allocation of capital funds and from capital receipts generated from the disposal of sites which become surplus, together with £20m from its endowment funds, leaving £551.7m to be provided by SGHD in the form of a specific allocation of capital funding to the Board. This represents the level of capital funding which the Board requires to deliver the proposal contained within this Outline Business Case, and which is the subject of the Outline Business Case.

The Board has tested alternative procurement routes for delivering the new Adult and Children's Hospitals, assessing each of these in terms of their capacity to deliver Value for Money and Affordability. The outcome of this assessment confirms that there is little to differentiate the alternative procurement routes in terms of their capacity to deliver Value for Money, however a publicly funded capital route offers the potential to deliver an affordable solution within the context of the Board's financial plan for the 10 year period to 2017/18.

In testing the affordability of a new service commitment of this scale, the Board has required to prepare a 10 year forward financial plan which examines the movements in both funding and expenditure which it is likely to face over this time period. In doing so, it has identified and assessed the key areas of risk which could impact on its financial projections, and reviewed its capacity for mitigating these through management action. On the basis of this analysis, the Board is able to conclude that the proposal which is contained within this OBC is affordable.

1.9 ASSOCIATED CAPITAL WORKS

As described, there are a series of smaller capital works and developments associated with the new hospitals, these being: clearance of the build site, development of multi-storey car parks, a clinical support facility and a 22 bedded rehabilitation facility.

The capital cost of these associated works is identified and will be funded from within the Board's Capital Allocation provided through separate business cases. Those projects above the Board's delegated authority will be subject to Capital Investment Group, Scottish Government approval.

It is proposed that all of the above projects and the new adult and children's hospital will be planned and co-ordinated through a Site Programme Co-ordinating Group, ensuring that all potential risks that may occur in delivering a multi-construction project environment are appropriately managed.

1.10 PLANNING PERMISSION

The Outline Planning Application was submitted to Glasgow City Council on 13th April 2007. The application was considered at the Glasgow Planning Committee meeting held on 16th January 2008 and received approval subject to specific conditions and the Section 75 legal agreements.

1.11 UNIVERSITY – WORKING WITH ACADEMIC PARTNERS

Glasgow University is intending to support the development of the Southern General campus by building an academic centre on the site. This will provide a modern academic facility to support teaching and research. An area of land on the Southern Campus has been identified by the Health Board for this purpose.

A new multidisciplinary Skills and Education Centre is also proposed. Partners in this include the Royal College of Physicians and Surgeons of Glasgow, the University of Glasgow and NHS Education for Scotland. A site adjacent to the new hospitals has been identified as a possible location.

1.12 FACILITIES, TECHNOLOGY, WORKFORCE

The reconfiguration of services across Glasgow will have a major impact upon the workforce and the requirements for information technology and facilities.

The Health Board's intention is to provide all hard and soft FM services from within NHS Greater Glasgow and Clyde's facilities pool and to explore the most effective methods of service delivery through benchmarking to achieve value for money and efficiency for these services. The FM services for the PFI Langlands Building in the south of the southern campus will remain with the present contractor and will not form part of this exercise.

There is a need to invest in significant Information Technology (IT) infrastructure with appropriate functionality to support the reconfiguration of services and emerging models of care, which will be crucial to the successful implementation of modern efficient healthcare systems.

As the largest NHS employer in Scotland, NHS Greater Glasgow and Clyde will continue to undertake effective workforce planning linked to issues of service delivery and redesign.

This will allow any future workforce gaps to be identified as well as to set in motion a range of solution based action plans.

The proposal to develop the South Glasgow Hospital site will consolidate a range of services which will require the transfer of staff from a number of existing sites across the city. The opportunities for redesign offered by the new investment in facilities and the consolidation of workforce onto fewer sites will allow for significant re-profiling of the workforce.

In determining the potential workforce implications of change, workforce planning methodologies have been developed in conjunction with input from Service Directors and Professional Leads. This has involved analysing a range of policy and legislative drivers for change and a review of the subsequent knock-on effect for future workforce requirements.

1.13 REDESIGN OF SERVICES

Another important aspect in the success of the project will be a proactive programme of redesign of services to:

a) ensure efficient services which:

- meet patient needs;
- offer one-stop services;
- offer quick access to diagnostic services;
- reduce the amount of time patients are in hospital;
- provide a balance of care and treatment in the community.

b) provide a high quality streamlined service within the projected bed complement;

c) influence the optimal building layout and design.

An important aspect of the redesign work will be the interface with the Community Health (and Care) Partnerships to ensure, where appropriate, services for patients are provided outside of hospital settings.

A programme of redesign work is underway to address the models of care associated with the Ambulatory Care Hospitals. The programme is closely linked to the planned changes in regional workforce planning and the development and implementation of the information Management and Technology Strategy.

The methodology and templates being put into place to take this work forward will be applied to the New South Glasgow Hospital ensuring consistency in care models and a streamlined flow of service provision within Glasgow.

1.14 PROJECT MANAGEMENT ARRANGEMENTS

Robust Project Management arrangements are in place to ensure that the project, and the individual elements within it, meet the expected time, cost and quality criteria.

1.15 PARTNERSHIP WORKING

The Board is committed to partnership working. There is an open and inclusive approach to staff side communication and the Board. The project management arrangements incorporate partnership working and staff side input with staff side membership on the two key project groups Project Executive Group and the Acute Services Review Programme Board.

1.16 COMMUNITY ENGAGEMENT

NHS Greater Glasgow and Clyde established a Community Engagement team in 2002 to inform and involve patients and the public in the acute services strategy. Dedicated staff have been allocated to the new hospitals and an extensive programme of consultation with patients, carers, families is ongoing. Detailed work involving communities in Greater Govan and South West of Glasgow is also occurring. The team are working in partnership with both local and national organisations, such as Scottish Enterprise, to develop the full potential of the project for regenerating the wider area.

1.17 GATEWAY REVIEW

The New South Glasgow Hospitals project is subject to an Office of Government and Commerce (OGC) Gateway Review.

The review is an independent assessment confirming that the business case is robust to meet the business need, is affordable, achievable with appropriate options explored and likely to achieve value for money.

In doing this, the review outcome highlights whether aspects of the project are red, amber or green (traffic light system). Red means that the project cannot proceed to the next milestone until the issues identified as red are addressed. Amber means that the recommendations identified must be completed before the next Gateway Review stage. Green means that the programme or project is in good shape but may benefit from uptake of any green recommendations to enhance the project.

The project completed a Gateway Review Stage 1 assessment in January 2008. The outcome of the Gateway Review was that there were no red recommendations hence the project may proceed to the Board and Scottish Capital Investment Group with the Outline Business Case.

There were five amber and one green recommendations and these will be addressed before the Gateway 2 Review.

Director-General Health and Chief Executive NHS Scotland
Dr Kevin Woods

T: [redacted] F: [redacted]
E: [redacted]

The Scottish Government

Mr T Divers
Chief Executive
NHS Greater Glasgow and Clyde
Dalian House
PO Box 15329
350 St Vincent Street
Glasgow
G3 8YZ

Your ref:
Our ref: [redacted]
May 2008

NHS GREATER GLASGOW – NEW SOUTH GLASGOW HOSPITALS – OUTLINE BUSINESS CASE

Following consideration and a recommendation of approval of the above Outline Business Case (OBC) by the Health Directorate's Capital Investment Group (CIG) this investment in healthcare infrastructure was considered and supported by the Cabinet of the Scottish Government. I am pleased therefore to formally confirm approval of the OBC and invite your Board to proceed to develop the Full Business Case.

I would draw your attention to HDL(2005)19, *Freedom of Information (Scotland) Act 2002; publication of PPP contracts and capital business cases,* which requires all business cases/ addendums where the capital equivalent cost is in excess of £5m to be placed within the Scottish Parliament Library (SPICe) within one month of receiving approval. Therefore, I would be grateful if you could forward a public version of the FBC to Glenda Roy at the above address within one month of receiving this approval letter.

If you have any queries regarding the above please contact Mike Baxter on [redacted] or e-mail [redacted]

Finally I would like to take this opportunity to commend you and your staff for the quality of the business case submitted and your positive working relationship with the Health Directorates

Yours sincerely

[redacted]

KEVIN WOODS

From:	McGowan M (Mariane)
To:	Hanlon S (Steven)
Subject:	FW: New South Glasgow Hospitals - Full Business Case - PLEASE DELETE THIS EMAIL ONCE USED
Date:	21 March 2016 14:49:00
Attachments:	NHS Greater Glasgow and Clyde - New South Glasgow Hospitals - Full Business Case - Oct 2010.obr NHS Greater Glasgow and Clyde - New South Glasgow Hospitals - Full Business Case - Appendices - October 2010.obr NHS Greater Glasgow and Clyde - New South Glasgow Hospitals - Full Business Case - comments table.obr
Importance:	High

From: Roy G (Glenda)
Sent: 22 October 2010 13:18
To: Baxter M (Mike) (Health); Sizeland B (Bettina); Kinnear N (Norman); Waugh I (Ian); Tither S (Stephen); Marshall M (Marjorie); Michael N (Nils); Welsh J (Joe); Sheriff C (Carmel); Armstrong J (Jennifer); Calderwood C (Catherine); Macdonald S (Sheena); Froggatt J (John); Verrall R (Ricky); Connaghan J (John); Rhodes P (Paul)
Cc: Haggarty P (Phyllis)
Subject: New South Glasgow Hospitals - Full Business Case
Importance: High

Good afternoon

Please find attached NHS Greater Glasgow and Clyde's FBC for the New South Glasgow Hospitals and its appendices.

Please note that both documents are password protected. They are also huge in size so think twice before printing!

The passwords are as follows:

FBC – to open – gLASGOW

to print – gLASGOW123

Appendices – to open – Glasgow

to print – Glasgow123

It is hoped that this will be discussed at 9th November CIG meeting so could I ask that any comments you may have including nil returns be entered into the attached comments table by close of play 3rd November at the very latest.

Thanks

Glenda

Glenda Roy

Scottish Government Health Directorates

Health Finance Directorate | Capital Planning and Asset

Management

Basement Rear

St Andrew's House

Edinburgh

EH1 3DG

*[redacted]

* mail to : [redacted]

*[redacted]

MINUTES OF THE MEETING OF THE CAPITAL INVESTMENT GROUP (CIG) HELD ON TUESDAY 9 NOVEMBER 2010 AT 9.30AM IN CONFERENCE ROOM A & B, ST ANDREWS HOUSE

Present: Mike Baxter (Chairperson)
Norman Kinnear
Ian Waugh
Bettina Sizeland
Stephen Tither
Christine McLaughlin
Tracy Barschtschyk
Nils Michael
Carmel Sheriff
Yvonne Summers
Marjorie Marshall
Claire Wilkinson
Glenda Roy (secretary)

Apologies: Robert Peterson
Ian Williamson
Julie McKinney
Alison Cumming

	1.	**MINUTES OF THE LAST MEETING**
	1.1	The minutes of the 28 September 2010 meeting were approved and taken as a true record of the meeting.
	2.	**ACTION POINTS FROM THE PREVIOUS MEETING (PAPER 28/10)**
	2.1	Action point 1 – Mr Baxter referred to the North West Dumfries Primary Care project and advised the Group that the outstanding land issue had now been resolved, however written confirmation has still to be received.
	2.2	Action point 2 – Mr Baxter informed the Group that he had had an initial meeting to discuss the how the assessment of business cases should be done in future. The matters arising from the meeting are being taken forward and will be discussed at the next Capital Systems Sub Group which is due to take place on 25 November 2010.
	2.3	Action point 5 – The Group were advised that a number of issues had been raised in respect of NHS Greater Glasgow and Clyde's Outline Business Case for Possilpark Health Centre, in particular around design and security. Both Health Facilities Scotland (HFS) and A+DS worked with the Board to resolve these issues and provided supporting documentation which Primary Care colleagues

		have said they are content with. It was noted that the issues surrounding this project have proved that working with HFS and A+DS have worked well, however there is a need to monitor that the process is fit for purpose.
Action: Mr Baxter	2.4	Action point 7 – Mr Baxter confirmed that a national procurement for radiotherapy equipment had issued the OJEU on 1st November and said that the Board should be in a position to progress soon. Mr Baxter said that he would discuss the progression with Mr Matheson given that this project is a commitment within the maintenance programme.
	3.	**BUSINESS CASE TIMETABLE (PAPER 29/10)**
	3.1	Mr Baxter introduced Paper 29 stressing that the outcome of the budget is imminent and explained that his priority has been given to the New South Glasgow Hospitals Project and legal commitments.
	3.2	The Group were reminded that there will still be significant investment in capital next year which will need to be managed closely. Mr Baxter said that his priority will be getting projects to a stage in which they can progress and ensuring the delivery of the projects that are currently under development. He stressed that close continual engagement with NHS Boards will be essential.
Action: Mr Baxter	3.3	The Group were advised that it was hoped that a form of words would be approved and issued to Boards to provide advice handling of their internal approvals processes and the submission of business cases for CIG consideration until the Budget has been set in early 2011. Confirmation was provided that Business Cases received and timetabled up to March 2011 cannot be approved until the budget process concludes within the Scottish Parliament. Therefore CIG meetings will be deferred until February/March 2011. Health Delivery colleagues asked for a standard approach to this issue to be prepared to support Board Mid Year Reviews which were due to begin. Mr Baxter agreed to provide this.
Action: Mr Baxter	3.4	Further discussion took place on the use of revenue finance and other delivery vehicles. It was suggested that Scottish Future's Trust (SFT) be invited to give a presentation at what would have been the next CIG meeting on 14th December 2010. The Group agreed that his would be extremely helpful and requested that the invitation be extended to colleagues out with the CIG membership. Mr Baxter undertook to contact SFT.

	4.	**GATEWAY REVIEW UPDATE – HEALTH SECTOR (PAPER 30/10)**
Action: Mrs Barschtschyk	4.1	Given the previous conversation Mrs Barschtschyk suggested that a meeting be arranged with her, Mr Baxter and Mr Charlie Fisher to discuss the best way to proceed with Gateway Reviews.
	4.2	The Group were asked to note that the Gateway Review 3 for the New South Glasgow Hospital produced a really positive report. The review recommended the production of a 'lessons learned' report to support other public bodies undertaking major projects.
	4.3	Mr Baxter explained that DG Health receives copies of the Delivery Confidence Assessments produced through Gateway Reviews which gives him the opportunity to comment and ask for clarification from the relevant Board on any areas that are of particular concern. Mr Baxter confirmed that this system is working well and is proving to be a success.
	5.	**NHS FIFE – THE REDEVELOPMENT OF GLENWOOD HEALTH CENTRE - OUTLINE BUSINESS CASE – (PAPER 31/10) - ESTIMATED CAPITAL VALUE – £6.8m**
	5.1	Mr Baxter introduced Paper 31 and provided a brief overview of the project.
	5.2	Mr Baxter confirmed that there are still outstanding issues to be resolved which would be pursued to conclusion. It was noted that subsequent approval of the Outline Business Case will be withheld pending confirmation of capital resources available following the passage of the Budget Bill in February 2011.
	6.	**NHS TAYSIDE – MENTAL HEALTH PROJECT – FULL BUSINESS CASE ADDENDUM (PAPER 32/10)**
	6.1	Mr Baxter introduced Paper 32 and explained that all PPP projects are required to provide a Full Business Case Addendum providing details of the financial position which was achieved at financial close.
	6.2	The Group were asked to note that the unitary charge for the first full year of operations, the year ending March 2015, for the provision of all services and facilities at both the Murray Royal and Stracathro sites amounts to £10.039m. This is a decrease of £2.006m which was presented in the Full Business Case.
	6.3	Mr Baxter informed the Group that he had had a meeting with NHS Tayside on 8th November, who indicated that the construction of the project was on track and that Stracathro is progressing well and is ahead of schedule.

Action: Mr Baxter	6.4	On the basis of the information provided and with the agreement of the Group, Mr Baxter was content to recommend approval to DG Health.
	7	**NHS GREATER GLASGOW AND CLYDE – NEW SOUTH GLASGOW HOSPITALS – FULL BUSINESS CASE (PAPER 33/10) - ESTIMATED CAPITAL VALUE - £842m**
	7.1	Mr Baxter introduced Paper 33 and explained that there has been considerable discussion on this project during the Spending Review period.
	7.2	It was noted that the Full Business Case had been received after the CIG date for papers. The case had been circulated to give colleagues an opportunity to comment. It was confirmed that issues had been raised and that these have still to be concluded with the Board.
Action: Mr Baxter	7.3	Given the size of the project, Ms McLaughlin requested that she check the revenue affordability of the project before she agrees to sign off the business case. On the basis of the information provided and with the agreement of the Group, Mr Baxter recommended that the project be considered via expedited procedures once outstanding issues have been resolved.
	8.	**Any Other Business**
	8.1	**NHS Orkney** – The Group were advised that NHS Orkney have approved the Outline Business Case for Balfour Hospital and Kirkwall Dental Centre. It was also reported that there has been some Press coverage surrounding the Boards decision. Given the estimated capital value of £77.4m, a brief discussion took place around alternative ways that the project may be financed. Mr Baxter said that he would discuss further with relevant colleagues out with the meeting.
	9.	**DATE OF NEXT MEETING**
	9.1	The 14th December 2010 meeting has been cancelled.

Glenda Roy
November 2010

From: Tither S (Stephen)
To: Roy G (Glenda); Macdonald S (Sheena)
Subject: RE: New South Glasgow Hospitals - Full Business Case
Date: 15 November 2010 08:51:04

Glenda,
I have no comments on this.
ST

From: Roy G (Glenda)
Sent: 15 November 2010 07:28
To: Macdonald S (Sheena)
Cc: Tither S (Stephen)
Subject: RE: New South Glasgow Hospitals - Full Business Case

Sheena

Thanks for getting back to me. As yet no comments have been received from Primary Care, however Dr Armstrong has commented.

Kind regards

Glenda

Glenda Roy

Health Finance Directorate| Capital Planning and Asset Management

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From: Macdonald S (Sheena)
Sent: 12 November 2010 12:35
To: Roy G (Glenda)
Subject: RE: New South Glasgow Hospitals - Full Business Case

Many apologies Glenda – not been at desk to be able to deal with this but I am sure Steven will have contributed and as my comments are becoming seriously repetitive he will have included areas that I normally raise

sheena

Dr Sheena L MacDonald

Senior Medical Advisor

Primary Care and Community Care Directorate

Scottish Government

Room 1R05

St Andrews House

telephone [redacted]

From: Roy G (Glenda)
Sent: 04 November 2010 10:07
To: Tither S (Stephen); Calderwood C (Catherine); Macdonald S (Sheena); Connaghan J (John)
Cc: Haggarty P (Phyllis); Aitken S (Stuart)
Subject: FW: New South Glasgow Hospitals - Full Business Case
Importance: High

Good morning

I refer to the e-mails below. The deadline for commenting on the New South Glasgow FBC has now passed. A small extension is being given, therefore if you wish to comment then please do so before **close of play Friday 5th November**. If no comment has been received by the revised deadline then it will be assumed that you are content with the FBC.

Stuart – Previous discussion noted. Document now released to enter Health Finance contentment.

Regards

Glenda

Glenda Roy

Health Finance Directorate| Capital Planning and Asset Management

From: Roy G (Glenda)
Sent: 02 November 2010 09:51
To: Baxter M (Mike) (Health); Sizeland B (Bettina); Kinnear N (Norman); Waugh I (Ian); Tither S (Stephen); Marshall M (Marjorie); Michael N (Nils); Welsh J (Joe); Sheriff C (Carmel); Armstrong J (Jennifer); Calderwood C (Catherine); Macdonald S (Sheena); Froggatt J (John); Connaghan J (John); Rhodes P (Paul)
Cc: Haggarty P (Phyllis)
Subject: FW: New South Glasgow Hospitals - Full Business Case
Importance: High

Good morning

I refer to my e-mail below. As only one comment has been received, I wanted to remind you all that the deadline for comments on the attached business case is close of play tomorrow.

Regards

Glenda

Glenda Roy

Health Finance Directorate| Capital Planning and Asset Management

From: Roy G (Glenda)
Sent: 22 October 2010 13:18
To: Baxter M (Mike) (Health); Sizeland B (Bettina); Kinnear N (Norman); Waugh I (Ian); Tither S (Stephen); Marshall M (Marjorie); Michael N (Nils); Welsh J (Joe); Sheriff C (Carmel); Armstrong J (Jennifer); Calderwood C (Catherine); Macdonald S (Sheena); Froggatt J (John); Verrall R (Ricky);

Connaghan J (John); Rhodes P (Paul)
Cc: Haggarty P (Phyllis)
Subject: New South Glasgow Hospitals - Full Business Case
Importance: High

Good afternoon

Please find attached NHS Greater Glasgow and Clyde's FBC for the New South Glasgow Hospitals and its appendices.

<< File: NHS Greater Glasgow and Clyde - New South Glasgow Hospitals - Full Business Case - Oct 2010.obr >> << File: NHS Greater Glasgow and Clyde - New South Glasgow Hospitals - Full Business Case - Appendices - October 2010.obr >>

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It is hoped that this will be discussed at 9th November CIG meeting so could I ask that any comments you may have including nil returns be entered into the attached comments table by close of play 3rd November at the very latest.

<< File: NHS Greater Glasgow and Clyde - New South Glasgow Hospitals - Full Business Case - comments table.obr >>

Thanks

Glenda

Glenda Roy

Scottish Government Health Directorates

Health Finance Directorate | Capital Planning and Asset

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Basement Rear

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Edinburgh

EH1 3DG

*[redacted]

* mail to : [redacted]
*[redacted]

Acting Director-General Health and Chief Executive NHS Scotland
Derek Feeley

T: [redacted] F: [redacted]
E: [redacted]

The Scottish Government

Mr Robert Calderwood
Chief Executive
NHS Greater Glasgow and Clyde
JB Russell House
Gartnavel Royal Hospital
1055 Great Western Road
Glasgow
G12 0XH

Your ref: [redacted]

10 December 2010

Dear Robert

NHS GREATER GLASGOW AND CLYDE – NEW SOUTH GLASGOW HOSPITALS – FULL BUSINESS CASE

Following consideration and a recommendation of approval of the above Full Business Case (FBC) by the Health Directorate's Capital Investment Group (CIG) this investment in healthcare infrastructure was considered and supported by the Cabinet of the Scottish Government. I am pleased therefore to formally confirm approval of the FBC and invite your Board to proceed to implementation.

Please note that in accordance with the Revised SCIM Guidance, which replaces earlier guidance contained in NHS HDL(2005)19 issued on 22 April 2005, www.scim.scot.nhs.uk/Approvals/Pub_BC_C.htm, all business cases/ addendums in excess of £5m are required to be placed within the Scottish Parliament Library (SPICe) within one month of receiving approval. Therefore, I would be grateful if you could forward a public version of the Full Business Case to Glenda Roy at the above address within one month of receiving this approval letter.

If you have any queries regarding the above please contact Mike Baxter on [redacted] or e-mail [redacted]

Finally I would like to take this opportunity to commend you and your team for the quality of the business case submitted and the development work undertaken with the contractor you have appointed.

Yours sincerely

[redacted]

DEREK FEELEY

St Andrew's House, Regent Road, Edinburgh EH1 3DG
www.scotland.gov.uk

New South Glasgow Hospitals and Laboratory Project

Acute Services Strategy Board

8th March at 10am in Meeting Room 1, Project Offices

Present

Robert Calderwood (Chair)	Chief Executive, NHS GG&C
Alan McCubbin	Head of Finance, NHS GG&C
Barry White	Chief Executive, Scottish Futures Trust
Jane Grant	Chief Operating Officer Acute Division, NHS GG&C
Mike Baxter	Deputy Director Capital Planning & Asset Mgmt, Scottish Government

In Attendance

Alan Seabourne	Project Director, NHS GG&C
Douglas Ross	Director, Currie and Brown
Helen Russell	Audit Scotland

Apologies

Paul James	Director of Finance, NHS GG&C
Rosslyn Crockett	Board Nurse Director, NHS GG&C
Stephen Gallagher	Health Delivery, Scottish Government

Allyson Hirst (notes)	PA Project Team

1. Welcome and Apologies

   Apologies noted above.

2. Previous Minutes

   Previous minutes of 12th December 2011 were accepted as an accurate record.

3. Matters Arising

   There were no matters arising to note that were not already on the agenda.

4. New Hospitals and Laboratory Update

   AS spoke to enc 2 on the progress to date on the New South Glasgow Project. AS reported the Laboratory Project was scheduled to be handed over on Friday 9th March and noted that the close out process was being worked on until handover. At handover of the building it will be possible to release approx £1.5M retention fee with the remainder being released after the 2 year defects period.

   There are defects identified on the building which are of a minor nature with the exception of the seedam roof which will need to be re-planted at the appropriate time.

   AS reported that BT had been unable to complete the installation of all the telephones in time but this would not pose a problem as the building will not be in full use until July 2012.

   Some externals were not complete but it was noted that these were actually programmed

under stage 3 of the contract and would be complete on a temporary basis to allow access to the building for staff and equipment.

AS was pleased to note that the contract had completed on time and under budget.

From Monday 12th March Managed Service Contract installations would commence and due to the power testing carried out this week the testing of the fridges within haematology had to be carried over into the following week. AS informed members that the migration plan would start on Saturday 10th March From Monday 12th March training and induction would commence for almost 800 staff who would be working within the building.

Gateway

AS reported the Gateway Review was now complete and was pleased to report that Readiness for Service Assessment and had been given at **Green**. There were three minor issues raised from the Review. These were

I. All risk registers should be collated as one (this to include technical and non-technical risk registers)
II. Continue to develop benefits plan
III. Take any lessons learned from labs into new hospital project

Stage 2

AS noted that work was progressing and the project team were currently meeting with users to make detailed decisions on equipment such as medical gas pendants.

Equipment

AS reported that group 2,3,4 and 5 equipment list was now completed and was sitting at £70M (total spend if all new). This does not take account of equipment to be transferred from current hospitals.

Change Control

AS reported to the group on the progress of the previously noted changes requested at 1:50 stage.

Ophthalmology (out-patient) change of treatment room to clean room - this was currently sitting with JG for approval.

Ophthalmology request to change office area into a waiting area - after consideration and consultation with project team it was decided to keep as an office area.

ENT requested to convert bedroom area into a treatment room - this has been approved by the Directorate and there was no cost implication.

Change to Guidance

AS reported that due to changes in fire regulations regarding hospital atria published in January 2012 he was currently working with BMCEL to agree the changes and noted that the approximate costs were reported to be in the region of £150,000.

Piling

In the latter half of December 2011 AS advised that a problem had arisen with a number of

piles (9 locations). AS was intending to report that 29 piles were affected by the problem but after completing the review of all piles it was noted that there were in fact 47 locations that indicated problems which in real terms is 71 piles affected. Survey results indicated

1) All defective piles are in the basement and in the batter (ie excavated slope)
2) The forces from the batter (horizontal) has caused piles to bend and be out of tolerance (ie concentric position) by more than 75mm (some are out by 450mm)
3) Brookfield appointed Robert Bird Group (RBG) to carryout an investigation on why this happened and initial findings were

    a) piles were originally set in the correct position
    b) there doesn't appear to be any surcharge pressure
    c) batter design had potential to create instabilities
    d) concerns about the dewatering system effectiveness

Brookfield and their advisors have agreed on the required remedial works which involves installing 161 mini-piles in the areas affected. This work is being programmed into the construction process and we await to be advised if there is any impact on the critical path.

The initial estimate for the cost of this additional work is in excess of £2M. Brookfield have raised a claim for pile damage to their insurers (Marsh) and await their response.

Energy Centre

AS reported that this was progressing as noted in the enclosure. AS noted that it was the intention to complete and take handover of A side of the energy centre in August 2012 and this will allow temporary generators to be removed from site sooner than anticipated.

Car Park Completion Works

DR presented the paper Enc 3. DR advised there were 3 car parks to be constructed and that today he was presenting the options to procure car park 1.

DR advised that the overall budget estimate for all three car parks was now estimated at £25.4M with the original estimate of £23.8M. He advised that due to mitigation of risks (enc 7) this budget could now be afforded within the overall project contingency. DR explained his reasoning for the make up of the costs and requested the Board approve this budget limit. BW raised the question of the costs as it was noted that construction prices were currently lower than in previous years. DR responded that due to the complex design specifically around Car Park 1 - situated over the currently built sub-station and that there was an additional road to be built to access the car park and would be more costly than the first car park. The group asked for further detailed breakdown on the reasons behind the cost increase which were available but not noted within the paper submitted to the Group. This information was to include the elemental cost including design and externals which were different to the other car parks. DR agreed to pull this information together and forward to the group at the earliest opportunity. The group agreed to ring fence £1.6M budget increase for the car parks in anticipation of receiving the cost information from DR. The group were happy for this to go forward to the Quality and Performance Committee.

DR reviewed the second part of Enc 3 in relation to procurement option for Car Park 1. The recommendation was to negotiate the car park construction with BMCEL. RH outlined the legal position in that the Board can negotiate with BMCEL under the terms of the original procurement exercise. RH also provided notes on the measures to be taken to manage any procurement challenge from 3rd parties.

AS noted that by continuing with the current contractor for car park 1 it would lessen the

potential risks that could be incurred by having an additional contractor on an already congested site. The group agreed the procurement recommendation and suggested changes for review prior to the presentation to the Quality and Performance Committee for final approval.

Car Park 1 Fees

DR left the room in order that the group could discuss technical fees for park park 1. AS advised that as this new work (ie car park 1) was not part of the initial project scope he required additional resources to complete this work. He advised that he could deliver the design, project management and cost management within the fee cap of 6% (the completed car park was 6.8%) and this cost was contained within the indicative budget of £12M exc VAT (reference Enc 3).

AS also requested that the current technical and supervisor project advisors be commissioning to carryout this work. AS stated it would not be advisable to introduce a new advisor team into the project. AS also made the case to employ a company called Hypo-style Architects who had completed the first new car park to do initial work to a maximum value of £35K and took the Board through the reasoning as described in Enc 4. The Board were generally satisfied and noted their approval for appointment of the current Advisors, and agreed that Hypostyle architectural services could carry out the initial design work and the paper would be forwarded to the Quality and Performance Committee for final approval and progression.

DR rejoined the meeting

5. Finance

Change Control Process

DR reviewed the Change Control process paper marked Enc 5 - noting the two items that had moved to conclusion. The allowance for weather conditions had not yet been fully resolved as Currie and Brown were still to fully review the data.
RC questioned the two lines noting agreed and potential equipment - DR explained that first line indicated those items that were now fully resolved and the second line were those that still required some work to finalise therefore further savings were anticipated.

Defined Costs

DR reported that the defined costs were sitting at £2.7M below target price and that within 3 months all contractors prices would be concluded and finalised for the laboratory.

Overall Budget

AMcC reported on paper marked enc 6 - and noted that it remains unchanged from the previous submission. Table 1 now included interface costs for Car Park 1

Key Risks

DR reported on paper marked enc 7 and noted the changes to risk allowances arising from mitigation strategies and general progress of works., Risks for client changes, approval delays , and equipment risk have been reviewed and the potential financial impact reduced. The residual funding for other risks (including contribution to Car Park 1, 2 & 3) has increased from £18.5M to £25.4M, now fully covering the original Car Park costs (included in previous Board Capital plan) and the potential revised costs as noted in Enc 3.

Inflation Liability Calculation

As requested at the previous meeting this paper was included to show clearly the predicted inflation calculations and DR noted that the RPI data was included. Following review of the paper the group agreed that the figure of £20M was appropriate but would be continually reviewed at future meetings. BW requested that a further scenario be considered to show a rise of 0.5% for the next meeting. The group noted that the monies held within the risk was higher than actually required and this would be reviewed at the next meeting.

6. Small to Medium Enterprise Procurement

Small to Medium Enterprise paper was reviewed by the group as was previously requested at the December meeting. AS reported that although the figures could be higher BMCEL were working with local agencies to improve this. There are clear learning requirements for local SME's/SE's which BMCLE have been addressing. BW asked if it would be possible to break down these figures to show the areas where staff on the site actually lived but it was explained that contractors would live locally no matter where they came from hence not providing a true picture of local benefit.

7. ASR Update

JG reported on the paper marked encl 10 – the first point to note was that the name of the group had been changed to "On the Move" to differentiate the re-design programme in relation to the new hospital from the more strategic Clinical Services Review. JG detailed the work being undertaken by the various workstreams and agreed to include, for the next meeting, a section detailing the work on the laboratory changes in service. JG outlined the main areas of workstream activity as detailed in the paper and stated that one of the main areas of the focus would be the separation of emergency and elective work streams, where clinically appropriate.

It was noted that there was a separate workstream for children's services but JG highlighted that the aim of that workstream would be to ensure that similar principles were adopted in both the children's and adults hospitals in relation to issues such as patient management, bed flows and overall performance metrics. AS noted that, as the project for the hospitals moves from the design stage to the construction phase, the project team would be involved in the overall "On the Move" programme.

8. ACOB

RC noted that Jennifer Armstrong and David Stewart should be invited to join the group as the Boards Medical Director and Acute Services Associate Medical Director respectively.

9. Date and Time of Next Meeting

As this meeting had been moved to accommodate other commitments the date of the next meeting was considered too soon and therefore the group agreed that the date could be moved to the first half of May. Diaries were to be co-ordinated and a new date would be issued.

New South Glasgow Hospitals and Laboratory Project

Acute Services Strategy Board

On the Move – Redesign Programme

1. Purpose

The purpose of this paper is to provide the Acute Services Strategy Board (ASSB) with an update on the work underway through **'On the Move'** to progress the planning and service redesign to deliver the current Acute Services Review. It sets out the key work streams established, with a structured programme of activities in relation to planning and redesign in place, to ensure a smooth transition of clinical services to the New South Glasgow Hospitals (nSGH) in 2015. It should be recognised that the redesign will also have implications Glasgow-wide, especially where changes to patient services and flows impinge on services in the north of the city.

The paper also provides a brief update on the progress to date.

2. Work Stream Groups

A structured programme of activities has been established under 6 main work stream groups. It is recognized that within these overarching groups there will be a range of sub-groups established which will look in detail at the components of the services covered by the work streams.

The work streams are:

- **Emergency Patient Flows Group** – this group will look at the planning required the redesign opportunities in the following departments; Emergency Department, Acute Assessment Unit, Diagnostic Imaging, Interface with Theatres and Critical Care**.**

- **Inpatient – Elective Care Group** will focus on elective activity, in particular inpatient requirements, downstream management of inpatient beds, Critical Care, Theatres, interface with diagnostic imaging.

- **Outpatient / Day Case / Ambulatory Care Group** will look at outpatient capacity and configuration, outpatient / diagnostic interface, Medical Day Unit, Day Surgery (Children's Hospital).

- **Primary Care / Community Interface Group** will explore the possibilities to reduce / avoid admissions, discharge management arrangements and long term care management.

- **Clinical Support Services, Facilities Services and Building Operational Group** The group will focus on how on a day to day basis the building and the clinical and non-clinical support services will function in support of the clinical services. The areas covered by this group include Direct Patient Care - Imaging and Diagnostics and Pharmacy; Clinical and building support – facilities management, Clinical Physics, IT Services and medical records.

- **Children's Services Group** will be consider the Paediatric service redesign based on the same principles as the adult hospital, considering the Emergency Department; the Observation Ward; elective care and outpatient requirements; the diagnostic interface; and will build on the work already underway.

The work stream leads are as follows:

Work stream	Lead
Emergency Patient Flows	Grant Archibald
Inpatient Elective Care Group	Jim Crombie
Outpatient, Day Case Ambulatory Care Group	Jonathan Best
Clinical Support Services, Facilities and Building Operational Group	Alex McIntyre
Primary Care Interface Group	Anne Harkness
Children's Services Group	Kevin Hill

In addition three advisory groups have been identified IT; Information and Activity; and Workforce. The key function of these Advisory Groups is support the work streams, provide advice and to ensure a standard approach is taken to IT, activity modeling and workforce issues. It will also provide a system wide view and facilitate cross fertilisation of information between work streams and will ensure key assumptions underpinning the delivery of the full business case are adhered to.

3. Membership

Each work stream group is jointly led by a nominated Director and AMD and sub-groups are led by a nominated General Manager and Clinical Director. Each group will include representation from Nursing, AHPs and Primary Care. To support each group there will be representation from: the nSGH's Project Team to give detailed information and advice regarding content and other aspects of the building; OD to ensure organisational efficiencies and provide facilitation; Planning Managers to provide planning and redesign support and act as a key link in communicating outputs of the ongoing work; and HR to advise on workforce issues.

The Director / AMD for the work stream is responsible for ensuring that detailed plans are prepared to support the programme and that the outcomes, with clear time lines for delivery, are clearly identified and achieved. The Director/ AMD will be responsible for ensuring the ASR Redesign Group are sighted on the work being undertaken to ensure there is a clear understanding of service expectations and working models.

4. Expected Outputs from Work Streams

The main outputs for each group include:

a) Review and update the activity modeling
b) Confirm patient flows and interfaces with other departments
c) Confirm / develop clinical models and look at redesign in its widest context
d) Identify / confirm workforce (within parameters of the overall workforce model)
e) Develop Operational Policies for the new hospitals
f) Prepare departmental migration plans to support the overall migration plan to the new hospitals

5. Timeline

The timelines for the work streams to produce the outputs (a) to (e) listed above, is December 2012. This will allow the service redesign identified to be progressed wherever possible in the intervening time before the opening of the new hospital and will also allow workforce implications, job plans etc. required to support the service models in 2015 to be addressed.

During 2013 the focus will shift to developing detailed migration plans for transfer into the New South Glasgow Hospitals. The following table gives this in more detail.

Activity	***Timescale***
New South Glasgow Hospitals Programme	**Present – Summer 2015**
High level approach agreed	Sept 2011
Programme of work defined with groups established	Oct 2011 - Dec 2011
Detailed planning and redesign to develop operational policies	Aug 2011 - Dec 2012
Start to implement Redesign programme where possible	Aug 2011 - March 2015
Commissioning Plan agreed	March 2012
Detailed Migration Plans prepared	Jan - September 2013
Hospitals buildings commissioned	Spring - Summer 2015
Services Migration to new Hospitals	**Spring – Summer 2015**

6. Progress to Date

Initial workshops have been set up to define the work programme and to ensure that all areas of work required have been identified. This has included determining the main subgroups, leads and membership to take the programme of activity forward. The physical plans for the hospital and briefing packs on the assumptions / KPIs / activity underpinning the planning of the hospital have been prepared to support the work streams.

A meeting of the work stream leads has been arranged to provide an update on the subgroups and the work plans identified with the aim to check all areas are covered within the programme, areas where there is overlap to determine the approach and finalise off the overall programme.

Jane Grant
Chief Operating Officer
February 2012

SCOTTISH HOSPITALS INQUIRY

Bundle of documents for Oral hearings commencing 16 September 2025 in relation to the Queen Elizabeth University Hospital and the Royal Hospital for Children, Glasgow

Bundle 48 – Governance PPP

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