SCOTTISH HOSPITALS INQUIRY

Hearing commencing 24 April 2023

Bundle 11 – Provisional Position Papers

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SCOTTISH HOSPITALS INQUIRY

Provisional Position Paper 1

The Reference Design utilised for the Royal Hospital for Children and Young People and Department for Clinical Neurosciences

Purpose of the Paper

This Provisional Position Paper has been produced to assist the Chair in addressing the Terms of Reference. It outlines the Inquiry Team's understanding of the means by which a 'reference design' was adopted for the Royal Hospital for Children and Young People and the Department for Clinical Neurosciences (RHCYP/DCN) and the reasons for that approach.

An earlier draft of this paper was circulated to some Core Participants (CP) for consideration and comment. Those comments have been considered by the Inquiry Team and taken into account in finalising this paper.

The paper focusses on the period from November 2010 to January 2015. The paper explores:

- The contextual factors leading to the decision to produce a Reference Design;
- The agreed scope and purpose of the Reference Design;
- The procedures for reviewing the Reference Design;
- The provision of the Reference Design to tenderers; and
- The adoption of the Reference Design by the preferred bidder.

In due course, the Chair is likely to be invited by the Inquiry Team to make findings in fact, based on the content of this paper. The Inquiry Team does not presently intend to lead further detailed evidence on the matters outlined in it, though inevitably some of those matters will be touched upon to a greater or lesser extent in the hearing set to commence on 24 April 2023. In addition, it is open to any CP – through evidence or submissions – to seek to correct and/or contradict it. It is therefore possible that the Inquiry's understanding of matters set out in the paper may change, and so the position set out in this paper remains provisional. If it is the case that the Inquiry Team's understanding does change significantly, a revised edition of this paper may be published in due course.

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1. Introduction

1.1 The purpose of issuing this Provisional Position Paper (PPP) is to set out the Inquiry Team's provisional assessment of why the mechanism of a 'Reference Design' was adopted for the Royal Hospital for Children & Young People/Department of Clinical Neurosciences (RHCYP/DCN), how it was developed and its role in the procurement exercise for the hospital. In particular, this PPP is concerned with the reasons why NHS Lothian (NHSL) mandated aspects of the RHCYP/DCN's design and why an Environmental Matrix containing environmental information was provided to prospective tenderers.

1.2 The terms of the PPP have been informed by comment from CPs and reflect the Inquiry Team's understanding of the evidence it has available to it. It is intended to assist CPs, as well as informing CPs and the general public of the findings that the Chair may be invited to make by Counsel to the Inquiry. If CPs wish to dispute, or supplement, what appears in the PPP, the Inquiry Team invites them to do so either by way of witness statements or through submissions. In the absence of such notice, the Chair may adopt some or all of what appears in the PPP for the purposes of addressing the Terms of Reference without necessarily considering further evidence.

1.3 The scope of this paper focusses on the period from November 2010 to January 2015. This covers the period when design work conducted under the capital funding model was carried forward for producing a Reference Design under a Non-Profit Distribution (NPD) funding model, to when Integrated Health Solutions Lothian (IHSL) was appointed as preferred bidder and the Reference Design was superseded by work developed by IHSL.

1.4 Section 2 of this paper narrates the Inquiry Team's understanding of the principal steps whereby NHSL, with the advice of Mott MacDonald Limited (MML), adopted the concept of a Reference Design as a component within the procurement process for the RHCYP. Section 3 identifies what the Inquiry

Team understands to be key documents produced during the procurement process which relate to the Reference Design and which record how its purpose was understood and how it was put to use. Section 4 identifies what the Inquiry Team understands to be the practical implications on the RHCYP/DCN project as a result of adopting a Reference Design approach. Section 5 sets out the Inquiry Team's provisional conclusions from the evidence set out in Sections 2 to 4.

2. Background to the Reference Design

2.1 The need for a new children's hospital was first discussed by NHSL in 2005. The preferred site was adjacent to the Royal Infirmary Edinburgh (RIE). Once this site was approved, the Royal Hospital for Sick Children (RHSC) project developed through the Outline Business Case (OBC) stage, and early capital design work, from 2008 to 2010. The RHSC was initially to be delivered through Scottish Government (SG) capital funding, using the Framework Scotland procurement programme and the NEC standard form contract.

2.2 During this phase, MML was appointed by NHSL as NEC supervisor. Davis Langdon was appointed separately by NHSL as the NEC Project Managers, and BAM Construction (BAM) was appointed as the Principal Supply Chain Partner. A design was to be produced by BAM and the following design team:

- Nightingale Associates (Concept Architects);
- BMJ Architects (Clinical Architect);
- Hulley & Kirkwood (Services Engineer);
- Arup (Civils, Structural, Traffic and Transport, Acoustics and Fire Engineering); and
- Tribal (Health Planners).

2.3 On 17 November 2010, SG decided to change the funding structure. SG announced that the new RHSC would be funded by a non-profit distributing (NPD) model. This provided for private capital to be used for public projects with a capped return provided to the private sector partner. With the change in funding, it was also decided that the Department of Clinical Neurosciences (DCN) would be co-located with the RHSC and form part of the same project. The combined project was what became the RHCYP/DCN.

2.4 NHSL's Director of Finance (Susan Goldsmith) and Chief Operating Officer (Jackie Sansbury) prepared a report for the NHSL Finance & Performance Review Committee meeting on 12 January 2011. The report provided an

update on the RHCYP/DCN reprovision project. The Committee was invited to:

> "Approve progressing with a detailed reference design for a combined project as a key component of the NPD procurement route utilising either the current Framework Contract with BAM or by procuring the design team through the Office of Government Commerce (OGC) procurement solution."

2.5 The same report further advised:

> "The project and design team currently engaged through HFS Frameworks for the standalone RHSC have effectively been 'stood down' awaiting confirmation of a future role… All knowledge and information produced through the standalone RHSC design process is being captured for future use and consists of all design data at point of suspension, technical validation information, briefing data, cost data and construction information."

2.6 The reasons given in the report for pursuing this Reference Design approach included: "an objective to minimise both the delay to the programme…and the abortive and on-going costs". To achieve this outcome, it was proposed to utilise: "the existing design team to complete the design process". The Board of NHSL appointed MML as Technical Advisor for the revised project with the new funding model on 22 March 2011. The Reference Design Team were appointed under the Contract Control Order (CCO) between MML and NHSL dated 11 July 2011. The Reference Design Team was constituted of the same design team set out at paragraph 2.2 of this paper.

2.7 A review meeting took place on 23 December 2010, including the Scottish Futures Trust (SFT) and SG. Following consideration, NHSL concluded that the recognised route for NPD procurement was to take a 'reference design' to the market. However, as at 9 February 2011, the level of detail had yet to be determined.

2.8 A draft Advisory Paper produced by MML for the Board of NHSL in February 2011 advised that: “for the NPD procurement process, a Reference Design is required to be developed on behalf of the Board”. This position was amended in a later MML paper to reflect the fact that Reference Designs had been: “promoted by the Scottish Futures Trust and the Scottish Government”. In responding to an earlier draft of this paper, MML have told the Inquiry that although there are differences in the wording used in the papers, the intention was the same. Namely, that it was a requirement of SFT and SG that a Reference Design be used in all NPD Procurements.

2.9 The draft Advisory Paper by MML noted that further development of the design was required. In the absence of formal guidance, the Board of NHSL required to decide the extent of the development and precisely how a Reference Design would be used.

2.10 The draft Advisory Paper by MML drew a comparison with ‘Exemplar Designs’ in Public Private Partnership (PPP) projects, which were described as similar to the NPD model from a technical and whole life cost perspective. An Exemplar Design was defined as a design that represented just one example or solution to the output specification. By contrast, a Reference Design was defined as a design representing a specific solution, the key features of which the procuring authority wished to see in the final design. The draft Advisory Paper by MML noted that: “Both an Exemplar Design and a Reference Design represent a springboard for Bidders to develop their own designs however the level of prescription and fixity in the case of a Reference Design is greater.”

2.11 The draft Advisory Paper by MML advised that, historically, the standard approach on PPP projects in England was to develop a robust Exemplar Design. In Scotland, Exemplar Designs were used for indicative purposes only. Bidders were encouraged to develop their own ideas in response to the output specification rather than simply adopt the Exemplar Design. In Northern Ireland, bidders were expected to adopt and develop Exemplar

Designs, effectively rendering them mandatory and to be used as a baseline for bidders.

2.12 The draft Advisory Paper by MML noted that the initial view of the Board of NHSL was to pursue a Reference Design approach under NPD more in line with the Northern Irish Exemplar Design approach under PPP projects. The reasons for this included:

- The significant amount of design work already completed by BAM, resulting in a design that user groups were satisfied with. Although reworking was required to account for the addition of DCN, this was considered marginal compared to the levels of engagement required if three bidders were developing separate designs – with the risk that none of the bidder designs would be considered as effective as the Reference Design;
- NHSL wished to retain control over certain elements of the design. Pursuing a Reference Design was considered the most appropriate way of achieving this; and
- A Reference Design approach was considered the simplest and most cost effective route.

In responding to an earlier draft of this paper, NHSL have told the Inquiry that there had to be a greater level of prescription and fixity beyond an exemplar design because the RHCYP/DCN had to be adjoined to the existing RIE at Little France. The RIE was an existing Private Finance Initiative (PFI) site run by Consort Healthcare Ltd (Consort). NHSL and Consort had to agree and resolve issues such as (i) the interface between RHCYP/DCN with the RIE, and (ii) access/egress to RIE. NHSL's reference design provided bidders with an architectural representation of one possible concept design but which critically illustrated the mandatory requirements imposed on the Board of NHSL as a result of the pre-existing arrangements with Consort.

2.13 In light of this envisaged Reference Design approach, Donna Stevenson, Associate Director of SFT, suggested, in a Project Discussion of 1 February 2011, that contact be made with John Cole in Northern Ireland to learn from work done there concerning Reference Designs.

2.14 An Approach to Reference Design paper produced by MML in 2012 and discussed more fully in Section 3 of this paper summarised the perceived benefits offered by the use of a Reference Design in NPD projects. The paper considered that a Reference Design would reduce procurement costs and timescales, reduce the amount of clinical user consultation required during the Competitive Dialogue phase, provide greater cost certainty at OBC, and provide greater certainty over the eventual design solution.

2.15 In the draft Advisory Paper by MML, the suggested level of development for the Reference Design was informed by The Design Development Protocol for PFI Schemes (the DD Protocol), an approach to the design development process agreed between the Department of Health, NHS Estates, NHS trusts, the Health and Safety Executive, the Royal Institute of British Architects and the Major Contractors Group.

2.16 In 2007, the DD Protocol was revised as a consultative document to take account of the competitive dialogue procedure. According to the draft Advisory Paper by MML, Section 2 of the DD Protocol advised that a common theme for developing a Reference Design was to define and mandate the 'Clinical Functionality' of the design. 'Clinical Functionality' was defined at Appendix A of the draft Advisory Paper. It concerned the following issues but only in so far as each of these matters related to clinical use:

- the points of access to and within the development site and the buildings;
- the relationship between buildings;
- the adjacencies between different hospital departments;
- the adjacencies between rooms within the hospital departments;

- the quantity, description and spatial areas of those rooms;
- the location and relationship of equipment, furniture, fittings; and
- the location of and the inter-relationships between rooms within departments.

2.17 Appendix B of the draft Advisory Paper by MML set out a list of suggested 'deliverables' for the Reference Design. These suggested 'deliverables' largely reflect the deliverables later agreed for the Reference Design in the CCO appointing the Reference Design Team and discussed more fully at paragraph 3.1 of this paper.

2.18 The Project Working Group discussed how rigid the scope of the Reference Design should be. At a meeting on 26 May 2011, the Project Working Group recognised that: "defining things too rigidly may compromise the design quality". The Project Working Group appreciated that NHSL would need to be clear with bidders on the scope for flexibility. At a Project Working Group of 2 June 2011, a Procurement Options paper was tabled and discussed at length by all the parties present from NHSL, SFT, MML and Davis Langdon. Responses from Core Participants to a previous draft of this paper have indicated that the Procurement Options paper in question bears the issue date of 16 June 2011 and was prepared for NHSL by MML and Davis Langdon.

2.19 It was stated in the introduction to the paper that NHSL was in discussions with SFT: "to determine the shortest possible procurement route. The procurement process options, and their associated timescales, are directly linked to the approach adopted on the reference design". The paper considered four approaches to the Reference Design, along with their benefits and drawbacks.

2.20 Option A was to mandate the design so far as it related to Clinical Functionality. This had the perceived benefit of keeping the risk transfer profile intact, insofar as Clinical Functionality risk already sat with the

Procuring Authority, while all other design risk remained with the private sector. It was also suggested that Option A raised few issues with the Reference Design Team members subsequently joining bid teams. The approach was described as more encouraging of bidder innovation in terms of the architectural, services and structural solutions than other options, whilst allowing a greater level of certainty upfront over the clinical solutions than with an exemplar approach. The large part of the design to be developed was seen as an opportunity for potential bidders to use their expertise thus potentially increasing the attractiveness to the market. It was also considered to be the most cost-effective option. In terms of drawbacks, it was noted that mandating elements of the design would limit innovation to an extent, and involve a more detailed and longer competitive dialogue period than Options B and C to enable bidders to develop the design. The level of clinical engagement was also considered greater than Options B and C.

2.21 Option B was to mandate the full design. It was believed this would reduce the time required for competitive dialogue, as well as reducing to a minimum the level of engagement required between bidders and clinical user groups. It was also believed that Option B would give a greater degree of certainty over affordability of the project. The drawbacks of Option B were that it might require a longer period for the design stage before launching the procurement process, it raised risk transfer issues for the private sector (in that for the private sector to accept design risk, they would require a full due diligence exercise on the design), it was more costly to NHSL than Option A, and limited innovation to the extent that procurement became a competition based mostly around pricing.

2.22 Option C was described as the same as Option B, but involved novation of the Reference Design Team to the successful bidder. This option was noted as a new approach not done before on PPP or NPD type projects, requiring detailed analysis to understand the extent to which it was deliverable. Nevertheless, it was noted that this option, in reducing bid costs, was potentially more attractive to potential bidders than Options A and B. It was also noted that novation of the Reference Design Team would allow design

risk (excluding Clinical Functionality) to be transferred in full to the private sector.

2.23 Option D was to develop an Exemplar Design – referred to as the: “approach typically used in previous health PPP/PFI projects”. This was noted to be less costly than Options A, B and C and would transfer full design risk to the private sector (excluding Clinical Functionality) – however intensive clinical input throughout the bid period was anticipated, requiring the longest period for competitive dialogue.

2.24 Option A was selected and agreed as the favoured route at the aforementioned Project Working Group of 2 June 2011.

2.25 Another draft report titled ‘Procurement Strategy’ explained that Option A was a departure from what normally happened in a PPP type project. In response to an earlier draft of this paper, MML have told the Inquiry that this dates to July 2011. The report advised there was increasing precedent for Procuring Authorities to undertake a degree of design work in the early stages of a project and pass it to bidders either as mandatory or as an exemplar. The report comments that the Board of NHSL’s advisors had contact with potential bidders and this led them to the view that Option A would be acceptable to the market.

2.26 In response to an earlier draft of this paper, NHSL have told the Inquiry that it agreed to proceed on the basis of Option A since it adopted the principle of using a reference design (and therefore utilised some of the work done to date) while having advantages around risk transfer, innovation, market interest and cost of design without resulting in an unacceptable programme or overly onerous clinical user involvement requirements through the procurement process.

3. Key Documents Relating to the Reference Design

Contract Control Order appointing the Reference Design Team (the CCO)

3.1 The CCO appointing the Reference Design Team, dated 11 July 2011, set out the 'Deliverables' the Team had to deliver, and provided whether these would be mandatory for bidders to adopt.

3.2 In response to an earlier draft of this paper, MML have told the Inquiry that the purpose of the CCO was limited to appointing the Reference Design Team to develop design deliverables.

3.3 Room Data Sheets were categorised as a deliverable that would mandate and fix 'Clinical Functionality' (as defined at paragraph 2.16 of this paper). The Room Data Sheets were to be mandatory for bidders.

3.4 Capita was responsible for leading this phase, and Hulley & Kirkwood (H&K) were responsible for developing the 'environmental information'. From a review of the Room Data Sheet format, the Inquiry Team understands that 'environmental information' relates to aspects such as the noise, lighting, temperature, ventilation, and air pressure requirements needed for the effective service of clinical functions within specific rooms of a hospital. 'Environmental information' is variously referred to as 'environmental data' and 'environmental parameters' in the documentation available to the Inquiry Team. The Inquiry Team understand these terms to be interchangeable and will adopt the term environmental information in this paper for the sake of consistency.

3.5 This environmental information had not been included in the definition of Clinical Functionality set out at Appendix A of the draft Advisory Paper by MML and discussed in paragraph 2.16 of this paper. Thus it had not been included as a mandatory requirement for bidders.

3.6 For Mechanical & Electrical (M&E) engineering specifications, the CCO noted there would be no input from the Reference Design Team, although both the Engineering Design Philosophy and Energy Strategy and Schedules of Power, Heating and Cooling Loads was: “needed to support BREEAM pre-assessment”.

BREEAM 2008/2011 Comparison

3.7 In September 2011, H&K produced a report investigating the project’s potential to meet new Building Research Establishments Environmental Assessment Method (BREEAM) requirements.

3.8 The ‘Report Scope’ section states that: “‘BREEAM Healthcare 2008’ was first issued on 24 June 2008. As of 1 July 2008 all health authorities in the UK required that all healthcare buildings seeking OBC approval commit to achieving an Excellent rating.” This second point is not strictly accurate. The 2009 publication of HTM 07-07 did introduce such a requirement, but the requirement did not apply in Scotland. The requirement was introduced later in Scotland. In April 2009, ‘A Sustainable Development Strategy for NHS Scotland’ was published. It provided that: “Scottish Government Health Directorate support the general thrust of the other UK health departments that from August 2008 all Boards should seek to attain the BREEAM Healthcare ‘excellent’ rating for new builds and ‘very good’ rating for refurbishment of existing properties. SGHD [Scottish Government Health Directorate] is currently integrating such a requirement into its procurement policy and guidance, for building projects of £2 million or more.” The requirement was reflected in SG policy set out in Chief Executive Letter 19 (2010) (CEL 19) and in the Scottish Capital Investment Manual Business Case Guide of 18 July 2011: “All new build above £2m are required to obtain a BREEAM Healthcare/ or equivalent ‘Excellent’ rating”.

3.9 The ‘Report Scope’ section of H&K’s September 2011 paper further states that, during February 2010, H&K confirmed that an ‘Excellent’ rating was

achievable for the RHSC. Following the change of procurement route and inclusion of the DCN, H&K assessed the combined building under the 2008 assessment method. H&K confirmed on 8 July 2011 that an 'Excellent' rating was achievable. The 'Report Scope' does not explicitly state that this, and further BREEAM assessments, were based on the Reference Design. However, the Inquiry Team understands from responses from CPs to a previous draft of this paper that this was the case.

3.10 On 1 July 2011, the 'BREEAM 2011 New Construction' scheme was launched. This was a more onerous assessment method than 'BREEAM 2008'. The purpose of H&K's September 2011 report was to highlight the key differences between the 2008 and 2011 assessment criteria and how this would affect the BREEAM rating.

3.11 The report indicated that an 'Excellent' rating was not likely to be achieved under BREEAM 2011; a 'Very Good' rating being more achievable. A later assessment confirmed this. According to H&K, one of the minimum requirements to achieve an 'Excellent' rating under BREAAM 2011 was to reduce CO2 emissions 25% further than targets set as a result of Schedule 5, part 6 of the Building (Scotland) Regulations 2004, as amended by The Building (Scotland) Amendment Regulations 2010 (the Building (Scotland) Regulations). This reduction was to a level H&K believed was likely to incur significant design and cost implications for the project - even if it were possible to implement. On this basis it was not considered a practical proposition given the nature of the site. Notwithstanding this, H&K later confirmed in a Section 6 SBEM Compliance Report that the building could meet the CO2 emission targets set out Schedule 5 Part 6 of the Building (Scotland) Regulations, by adopting ventilation solutions aligned with the Environmental Matrix, discussed below.

The Environmental Matrix and Ward Room Thermal Comfort Analysis

3.12 SG policy set out in HDL (2006) 58 made the use of Activity Database Sheets mandatory. This policy was updated by CEL 19. CEL 19 includes a document called ‘A Policy on Design Quality for NHS Scotland’ (the Design Quality Policy). CEL 19 remained extant for the duration of the project.

3.13 Mandatory requirement 7 of the Design Quality Policy states that:

> “All NHS Scotland Bodies engaged in the procurement of both new-build and refurbishment of healthcare buildings must use and properly utilise the English Department of Health’s Activity Data Base (ADB) as an appropriate tool for briefing, design and commissioning.
>
> [If deemed inappropriate for a particular project and an alternative tool or approach is used, the responsibility is placed upon the NHS Scotland Body to demonstrate that the alternative is of equal quality and value in its application.]”

3.14 The Design Quality Policy also contains a section entitled ‘Activity Data Base (ADB)’ which states that:

> “Activity Data Base (ADB) is the briefing, design & commissioning tool for both new-build and refurbishment of healthcare buildings. It is a briefing and design package with an integrated textual and graphical database, an interface with AutoCAD and an extensive graphical library - the complete tool for briefing and design of the healthcare environment. ADB is produced by the Department of Health in England and is mandated for use in Scotland by the Scottish Government Health Directorates as the preferred briefing and design system for NHS Scotland (see Mandatory Requirement 7 of this Policy). It has been developed to assist in the construction, briefing development, design and alteration of healthcare facilities.

> Spaces designed using ADB data automatically comply with English planning guidance (such as Health Building Notes (HBNs) and Health Technical memoranda (HTMs) as ADB forms an integral part of the English guidance publication process. Whilst Scottish users can create their own project-specific briefs and designs using ADB's extensive library of integrated graphics and text which includes room data sheets, room layouts and departmental room schedules, extreme care should be taken to ensure that such data generated by the package are consistent and compliant with Scottish-specific guidance such as Scottish Health Planning Notes, Scottish Health Facilities Notes (SHFNs) and Scottish Health Technical Memoranda (SHTMs) as published by Health Facilities Scotland."

3.15 On 9 September 2010, H&K produced an 'Environmental Matrix' for the standalone RHSC, before the DCN was included in the project. This was the first Environmental Matrix associated with the project.

3.16 The purpose of the Environmental Matrix was set out in emails between H&K and BAM from that year:

> "With regards to environmental issues, rather than employ ADB M&E sheets, H&K will produce Environmental Matrix spreadsheet for each room type for easy reference as a user sign off tool." [15 February 2010]

> "This document is intended as an easier tool to replace ADB RDS M&E sheets for the elements covered in the matrix." [8 September 2010]

3.17 On 3 February 2012, H&K produced the first version of an Environmental Matrix for the combined RHCYP/DCN project. This was based on the initial Environmental Matrix of 2010.

3.18 H&K subsequently developed the Environmental Matrix of 3 February 2012 to produce an Environmental Matrix dated 19 September 2012. This Environmental Matrix was supplied to bidders with the Reference Design as

part of the ITPD, as will be discussed later in this paper. In a number of documents provided to the Inquiry Team, the Environmental Matrix of 19 September 2012 has been referred to as the 'Reference Design Environmental Matrix'.

3.19 Guidance Note 1 of the Reference Design Environmental Matrix stated that:

> "This workbook is prepared…as an easier reference tool to replace ADB RDS M&E Sheets for the Environmental Criteria elements described on these sheets."

3.20 In response to an earlier draft of this paper, H&K have told the Inquiry that the Environmental Matrix was derived by reference to published guidance including SHTMs and HTMs current at the time of the reference design (2011/2012) and Reference Design client briefing information, as referred to within the Guidance Notes page of the matrix. The Inquiry Team understands that this Reference Design client briefing information refers to an NHSL Design Brief dated 10 June 2011.

3.21 The 10 June 2011 Design Brief stated that:

> "Comprehensive NHS Estates design guidance has informed the departmental accommodation requirements; these include Health Building Notes (HBN), Health Technical Memoranda (HTM), Scottish Health Planning Notes (SHPN), Scottish Health Technical Memoranda (SHTM) and Activity Data Base (ADB). There are some slight variations between 'English' UK wide healthcare estates guidance and the Scottish versions. Project teams and designers have to be aware of this, however universal space and ergonomic standards apply."

Under the heading 'Heating, Ventilation and Air Conditioning Systems', the following text appeared:

"The need to maintain acceptable comfort conditions in all areas is of paramount importance and the designer needs to demonstrate their strategy for achieving optimum comfort together with minimum energy consumption.

"Ventilation systems provided throughout the hospital should comply with all relevant HBN and HTM standards".

3.22 H&K were asked by the Inquiry Team to confirm how it was demonstrated that the Environmental Matrix was of equal quality and value to ADB. H&K have advised the Inquiry Team that this relates to information outwith H&K's knowledge.

3.23 The Environmental Matrix specified environmental information that was potentially inconsistent with published guidance, namely SHTM 03-01 which outlines ventilation requirements in a hospital. Certain single and multi-bed rooms in the Critical Care department were shown in the Environmental Matrix to require 4 air changes per hour (ACH). This differed from the 10 ACH recommended for Critical Care Areas in SHTM 03-01. This inconsistent information was contained in the version of the Environmental Matrix provided to bidders within the ITPD. Specific aspects of the Environmental Matrix and its iterations are addressed in a separate paper by the Inquiry Team. This issue will also be explored in greater detail at the hearing in April 2023.

3.24 The first reference to the 4 ACH figure seen by the Inquiry Team is in an email of 2 July 2010 from H&K to BAM. 4 ACH is quoted as being sufficient to maintain a temperature range of 18°C to 28°C in typical single bedrooms and multi-bed rooms/wards (those not in Critical care). The design solution given for High Dependency Unit (HDU) bed areas is 10 ACH.

3.25 The email goes on to narrate that the 4 ACH: "would be supplemented by opening windows for natural ventilation". This information was repeated in the Guidance Notes of the very first Environmental Matrix of 2010 for the RHSC, before the DCN was included in the project.

3.26 H&K also produced a report titled ‘Ward Room Thermal Comfort Analysis’ on 21 February 2012. The purpose of the report was to determine peak temperature profiles for typical room accommodation, with a focus on identifying M&E engineering solutions that would keep internal temperatures below 25°C. This temperature was a briefed maximum by NHSL, given experiences in the ERI.

3.27 Simulations conducted for that report illustrated that exclusively mechanical ventilation and mechanical ventilation supplemented by some natural ventilation were both capable of maintaining a temperature of 25°C or less with only 4 ACH. H&K did not analyse Critical Care and HDU type ward rooms in the study. The report stated that: “…critical care and high dependency type ward rooms which receive air change rates in the region of 10 ACH, have not been analysed in this study”. The reference to critical care and HDU type ward rooms having 10 ACH is in line with SHTM 03-01.

3.28 In January 2015, the Board of NHSL, acting on input from NHS National Services Scotland (NHS NSS), considered that: “the design solution should not rely in any way with the opening windows”. This issue will be discussed further at paragraphs 4.20 to 4.23 of this paper.

The Outline Business Case (OBC) and Early Design Review

3.29 An OBC for the RHSC re-provision was submitted to SG and approved by the Capital Investment Group in August 2008. An OBC for the re-provision of DCN was approved by NHSL in December 2009, but did not proceed to SG because capital funding was not available. After the change in funding model to NPD, SG approved the development of an update to the existing (approved) OBC to include DCN as part of the same project. On 25 January 2012, that OBC was approved by the Board of NHSL.

3.30 At the time of the OBC, confirmation was pending on whether BREEAM 2008 or 2011 was to be adhered to. However, SG policy was for all new NHS buildings to achieve the standard of BREEAM Healthcare 'Excellent'.

3.31 Reference was made within the OBC to design task groups that would ensure staff could feed into the Reference Design. These groups were to engage with their colleagues and the project team to develop and agree operational briefs that reflected their requirements, and to review project designs and proposals and feed back to the design team. Provision was also made for a Reference Design Task Group to have monthly meetings.

3.32 In response to an earlier draft of this paper, IBI Group (UK) Limited (IBI) (formerly Nightingale Associates) have told the Inquiry that they are unaware of any monthly meetings between a 'Reference Design Task Group' but that regular meetings took place among the Reference Design Team members themselves. MML have informed the Inquiry that the following task groups were in place:

- Clinical Functionality
- Design and Construction
- Planning
- Consort Enabling Works
- Flood works
- Transport
- Art and Therapeutic Design
- Helipad Group
- Furniture and Equipment
- Catering
- Facilities Management

3.33 MML also advised in their response that Additional Task Groups dealt with the development of the contract documents covering the Clinical, Design & Construction, Legal and Financial aspects of the project. Specialist NHSL Project Managers led the meetings. MML representatives attended task group

meetings in an advisory role. A document provided by NHSL in response to an earlier draft of this paper states that the purpose of the design sub task groups was to produce, with the project and design team, proposed 1:200 designs for their department and any required detailed 1:50 designs. The 1:200 designs involved planning internal room adjacencies whilst the 1:50 designs involved input from user groups on specific equipment requirements of certain rooms (from coat hooks to large scanners).

3.34 Further provision was made in the OBC for Capital Planning Project Managers to act as the liaison between NHSL, the Reference Design workstream, and the Design and Construct workstream. They were to be responsible for informing the Board's Construction Requirements (BCRs) and ensuring these were agreed by the appropriate NHSL user groups. Neil McLennan and Graham Gillies were named in these roles in a Project Execution Plan from September 2011.

3.35 Provision was also made in the OBC for Clinical Management Teams (CMT), who had operational management responsibility for children's services and DCN, to sign-off the Reference Design at all stages prior to final approval by NHSL. In response to an earlier draft of this paper, NHSL have provided documentation to the Inquiry which indicates that these sign-offs related to departmental drawings and Clinical Output Specifications as opposed to environmental information. In their response to the earlier draft of this paper, NHSL have told the Inquiry: "The clinicians reviewed the design in relation to space and content, i.e. the layout, adjacencies, clinical activities and equipment required…The clinicians are not M&E engineers…NHS Lothian appointed Technical Advisors, MML, to manage the specialist M&E aspects of the project."

3.36 The OBC stated that the Reference Design and development of the final design with the preferred bidder would be subject to a range of reviews as work progressed. These reviews included a Health Facilities Scotland NDAP – Design Assessment. The Scottish Capital Investment Manual Supporting Guidance: Design Assessment in the Business Case Process, dated 5 July

2011, provided: “From the 1 July 2010 an assessment of design quality will become part of the business case approval process…Accordingly projects submitted to the Capital Investment Group (CIG) for business case approval will be assessed for compliance with current published guidance. To facilitate this, Boards will be requested to submit a comprehensive list of the guidance that they consider to be applicable to the development under consideration…together with a schedule of derogations that are required for reasons specific to the project’s particular circumstances…Projects submitted for the business case process will be assessed for compliance with the following:…SHPN…SHTM…The assessment considers the general areas of design being addressed by the project team as a high level verification for the board and the CIG, as such it should not be seen as a replacement for the project team’s in-depth consideration of technical and other standards.” The Transitional Arrangements set out in the document provided: “This guidance shall apply to all projects submitted for approval of the Initial Agreement (IA) after 1 July 2010. Projects that have not received approval of their Outline Business Case (OBC) by 1 July 2010 shall be considered for the assessment process on a case by case basis.”

3.37 On 6 February 2012, Thomas Brady of Davis Langdon emailed Richard Cantlay of MML and others and advised: “The reference design team have been trying to ascertain, for some time now, if we need to complete a NDAP (NHS Design Assessment Procedure) review of the scheme…a meeting was to be held on 20th Jan between SFT/HFS/A+DS/Scottish Government to discuss if the NDAP review procedure was a requirement for NPD Contracts.” In response, David Stillie of MML responded: “Meeting did take place on 20 January and I spoke to Peter Henderson (architect) at HFS on 23 January. No clear way forward came out of the meeting but he did say that everyone present appreciated that RHSC/DCN project had been reviewed ‘to death’. I was unable to get a definitive answer from him before the last RDT meeting as he wanted to discuss further with SFT. I think it now falls to NHSL, probably Brian, to move this forward with SFT. I imagine he is reluctant to raise the issue in case it prompts a further round of review meetings.”

3.38 In response to an earlier draft of this paper, IBI have provided the Inquiry with a Change Control Form dated 9 March 2012 that states: “Due to the reference design team being unable to obtain a clear brief from SFT, NHSL or the PME for the NDAP review please be advised that the reference design programme can no longer accommodate this review. Accordingly it has now been deleted from the Reference Design Team Scope of Works.”

3.39 Given that the OBC was approved in 2008, the transitional provisions in relation to NDAP reviews applied. There was no absolute requirement for an NDAP to be completed. The Inquiry has not been provided with an NDAP review by any CP. The Inquiry Team therefore proceeds on the basis that no such review was undertaken for the project.

3.40 The OBC stated that an Achieving Excellence Design Evaluation Toolkit (AEDET) had influenced development of the Reference Design. According to AEDET Guidance Notes produced for the RHCYP/DCN, AEDET was a tool for evaluating the quality of design in healthcare buildings. The toolkit was developed in partnership by the NHS, CABE (Commission for Architecture and the Built Environment), the Construction Industry Council, and Sheffield University. It was: “specifically aimed at achieving excellence in design rather than ensuring compliance with any technical criteria or legislation.” AEDET was: “designed to be used by those involved in the commissioning, production and use of healthcare buildings.”

3.41 The NHSL Design Brief dated 10 June 2011 and discussed at paragraphs 3.20 and 3.21 of this paper stated that: “The Reprovision project team will use AEDET as a structure to monitor agreed standards through all stages of design to completed construction.” In oral evidence given to the Inquiry on 18 May 2022, NHSL Project Director Brian Currie stated that AEDET: “was undertaken by essentially the reference design team led by the architect for the reference design team.”

3.42 According to the AEDET Guidance Notes produced for the RHCYP/DCN, AEDET split the design into ten sections to summarise how well a healthcare

building complied with best practice. A score was produced for each section, indicating its strengths and weaknesses. As at 12 August 2011, Engineering, Performance and Construction scoring criteria were deemed: “not relevant at this stage in design development”.

3.43 On 12 December 2011, an Independent Design Review of the RHCYP/DCN was published by Atkins Consultants Ltd (the Atkins Report). This was instructed by SFT to review the value for money of the proposed building design together with the programme-wide design objectives, namely that the design (i) met the strategic needs for efficient and effective long-term service delivery, (ii) eliminated unnecessary space, maximising the potential sharing of space and fully integrating with an efficient service strategy, and (iii) minimised the whole life costs of the building and achieved the appropriate sustainability targets.

3.44 The Atkins Report reviewed the Reference Design: “to assess value for money in the creation of the environment for patients and staff.” In relation to the AEDET review of 12 August 2011, the Atkins Report noted that: “A number of elements are unable to be scored at this stage because the design is insufficiently developed. In particular performance, engineering and construction cannot be scored at this stage.” The remainder of the Atkins review into the Reference Design was limited to the choice of site and ability to expand the development, access points, links to the RIE, orientation of patient bedrooms for sunlight, traffic flows within the building, and clinical adjacencies.

3.45 A later AEDET Review was undertaken on 8 March 2012. The author of this review is given as ‘DH Estates and Facilities’. The purpose of the document is stated to be ‘Best Practice Guidance’. Section F relates to Engineering and: “asks whether the engineering systems are of high quality and fit for their purpose, will be easy to operate and if they are efficient and sustainable.” This section was ‘unable’ to be scored (as opposed to ‘not relevant’). However, an email from SFT to NHSL advises that the Reference Design was completed before 30 April 2012. The Inquiry therefore understands that the Reference

Design was significantly developed at the time of this AEDET review, and that some degree of assessment of the Engineering criteria could have been possible.

3.46 The fact that the AEDET review includes an Engineering category suggests that review of this Reference Design element was envisaged. However it is unclear to the Inquiry Team what Reference Design outputs the review was aimed at assessing. M&E engineering specifications were produced by the Reference Design Team in the form of the Environmental Matrix, the first of which was produced specifically for the RHCYP/DCN on 3 February 2012. This constituted an engineering element of the design that was available at the time of the second AEDET review and which had a bearing on the design's efficiency and sustainability, as outlined in paragraph 3.11 of this paper.

3.47 In response to an earlier draft of this paper, IBI have advised the Inquiry that AEDET provides a toolkit for evaluating the overall design of healthcare buildings; it is not intended to involve a detailed review of the technical design or compliance with healthcare guidance. IBI have advised the Inquiry that, by 8 March 2012, it would not have been possible to review the design of the Performance, Construction and Engineering elements of the design. The outputs from the Reference Design process would have been insufficient to inform these elements. A review of these elements under AEDET would not, to IBI's understanding, have been aimed at assessing compliance with healthcare guidance such as SHTMs.

3.48 In response to an earlier draft of this paper, MML have advised the Inquiry that it was not party to the AEDET review of 8 March 2012 and therefore cannot confirm why Performance, Engineering and Construction were marked as 'unable' to be scored.

3.49 In response to an earlier draft of this paper, NHSL have advised the Inquiry that the M&E design information was always going to be limited at this stage. NHSL considers that it specified compliance with SHTM 03-01 as a minimum

engineering standard and it was for the successful bidder to either develop the M&E design to that standard or otherwise seek a derogation from SHTM 03-01.

The 'M&E Reference Design Approach Paper'

3.50 In an M&E Reference Design Approach paper of March 2012, H&K advised that:

> "The building engineering services Reference Design Envisaged Approach is set out to demonstrate that compliance with Section 6 2010 is possible and to provide the vision for an energy efficient hospital without detriment to reliability of service or comfort to the patient and staff whilst complying with all relevant statutory legislation and healthcare guidance."

The Inquiry understand that the above reference to 'Section 6 2010' refers to Schedule 5, Part 6 of the Building (Scotland) Regulations.

3.51 The M&E Reference Design Approach Paper continued:

> "Although the development will be designed to maximise the use of natural ventilation, it is intended that rooms will not be reliant on natural ventilation alone, unless they comply with maximum temperature limits listed in the RDS Environmental Matrices."

3.52 The document also contains an Encode Checklist with the following questions answered in the affirmative:

- "Has every effort been made to use a natural ventilation strategy?
- If natural ventilation is not possible, can a mixed-mode approach be used?
- If mixed-mode ventilation is not possible then has every effort been made to use the most efficient ventilation in accordance with HTM guidance?"

The 'Approach to Reference Design' Paper

3.53 The Approach to Reference Design paper was designed to be used as a basis for accurately conveying NHSL's intentions to bidders in relation to mandatory and non-mandatory elements of the Reference Design. MML were the lead authors, with collaboration from NHSL and SFT. In response to an earlier draft of this paper, MML have told the Inquiry that the paper was an internal document which was not issued to bidders.

3.54 The latest version of the paper is Revision J, dated 28 August 2012.

3.55 Revision J states that the RHCYP/DCN project required greater input than would normally be the case in preparing a Reference Design. This was attributed to unique issues surrounding development of the facility on the existing RIE site, such as connections required to the RIE building, and the restricted nature of the site being bounded on all sides by existing infrastructure.

3.56 The Executive Summary reiterated that the project board agreed to develop a Reference Design in July 2011 to mandate elements relating to 'Clinical Functionality'.

3.57 Concerned that 'Clinical Functionality' referred to both clinical and non-clinical functions, and that this could lead to confusion, the paper agreed that 'Operational Functionality' should be used in preference. This was because: "some of the mandatory areas of the Reference Design will cover non-clinical functions".

3.58 The paper does not define 'Operational Functionality'. This was something flagged for development by the Procurement Workstream when drafting the Project Agreement for inclusion in the ITPD. Although a definition reflecting 'Clinical Functionality' appeared in ITPD Volume 2, this was only in 2013. In Revision J, the only indication of what 'Operational Functionality' meant was

that it was ‘based’ on the definition of ‘Clinical Functionality’ set out at Appendix A. This reflected the definition set out in the draft Advisory Paper by MML discussed in paragraph 2.16 of this paper. Despite this, it was stated in Revision J that the principal purpose of the Reference Design was to define ‘Operational Functionality’.

3.59 Revision J provided that bidders were: “to be fully briefed on non-negotiable status of Reference Design”. Any attempt by bidders to revisit its terms were to be resisted. The justification for this was that further review might lead to: “additional affordability and programme risks” and curb the benefits of having prepared a Reference Design in advance of the ITPD.

3.60 An earlier draft of the Approach paper (Revision C) highlighted a concern that existed around the willingness of bidders to adopt mandatory elements of the Reference Design. NHSL’s Project Director Brian Currie, in reviewing this draft, commented:

> “Concern from whom? We need to be more assertive here and just state what we will be doing… we will be controlling the process and agenda not the bidder…This is a discourse which may invite lengthy debate which we don’t have time for”.

3.61 Revision J also advised that those parts of the Reference Design that did not relate to Operational Functionality (named the non-mandatory elements) were for bidders to develop with freedom: “constrained only by the requirements of the Board’s Construction Requirements” (BCRs). These were set out at Section 3 of Volume 3 of the ITPD.

3.62 Concern around the scope for bidders to develop their designs in light of the degree of mandatory elements was raised by Donna Stevenson, Associate Director of SFT, in a meeting on 26 April 2012 between SFT and NHSL. At this meeting, the Approach paper was discussed in detail. An email from Donna Stevenson to Brian Currie on 30 April 2012 indicates these concerns

related to the shape of the building. Brian Currie provided reassurance that bidders would be able to change this.

3.63 Non-mandatory elements of the Reference Design are considered under two headings in Revision J: information that would be prepared and made available to bidders even in the absence of a Reference Design, and information that had been prepared as a consequence of preparing the Reference Design. This information was to be issued only so bidders could understand the intent of the Reference Design. It was for bidders to refer to the BCRs for the detailed requirements, as BCRs took precedence over the Reference Design for non-mandatory matters. This was repeated in ITPD Volume 1 at paragraph 2.6: "Bidders are advised that the Board's Construction Requirements will always take precedence over the Reference Design for matters which do not define Operational Functionality…"

3.64 Revision J featured the Reference Design Deliverables at Appendix B, which advised that 'environmental parameters' within Room Data Sheets – understood by the Inquiry Team to mean the same as 'environmental information' - was mandatory for bidders to adopt. However as stated previously, environmental information was not included in the definition of Clinical Functionality, which was set out at Appendix A of Revision J.

3.65 References to Room Data Sheets were removed from the remainder of the Revision J.

3.66 The Inquiry understands that the removal of references to Room Data Sheets was done to reflect the fact that NHSL instructed Nightingales to cease production of Room Data Sheets by a CCO dated 17 May 2012.

3.67 According to Revision J:

> "previously in PFI and PPP projects, draft or indicative Room Data Sheets could be issued…In NPD projects with a Reference Design there is a

requirement for a more complete set of Room Information to be available to Bidders".

3.68 Revision J continued:

"The specific room requirements (the 'Room Information') will be detailed in a combination of:-

- The General Requirements (subsection C of the Board's Construction Requirements);
- The Clinical Output Specifications (subsection D of the BCRs);
- The Adjacency Matrix (appendix A to the BCRs);
- The Environmental Matrix (appendix B to the BCRs);
- The Schedule of Operational/Design Notes (appendix C to the BCRs);
- The Equipment Schedule (Schedule Part 11 of the Project Agreement);
- The Schedule of Accommodation; and
- The Operational Functionality elements of the Reference Design."

This paragraph stated that the:

"Environmental Matrix specifies parameters and criteria that need to be met and for which the Bidders will be required to advise the levels that will be achieved in their particular design."

The language used in this paragraph of Revision J, together with Appendix B, indicates that the environmental information contained within the Environmental Matrix, and therefore the document itself, was intended to be mandatory for bidders.

3.69 Revision J states that the: "Operational Functionality requirements for the RHSC/DCN will be outlined in the Clinical Output Specification, the Schedule of Accommodation and the Adjacency Matrix". Clinical Output Specifications provided information in relation to the scope of departments and the operational function of the individual rooms within them. The Schedule of

Accommodation specified minimum floor areas. The Adjacency Matrix specified the location of certain departments in relation to other departments. Since mandatory requirements were defined as those that set out Operational Functionality, by the logic of this statement, no other documents were intended to be mandatory for bidders to comply with.

Key Stage Reviews

3.70 The project was subject to periodic Key Stage Reviews (KSRs) conducted by SFT. These were a condition of SG funding support and designed to provide an assessment of the project's readiness before moving on to the next stage of the procurement process.

3.71 KSR 1 was issued on 4 December 2012. At Section 2.7, SFT raised issues as to the extent of mandatory elements in the Reference Design and commented that clarity was required on this in the ITPD. The final position was to be reviewed as part of the Pre-ITPD KSR (KSR 2).

3.72 KSR 2 was issued on 7 March 2013. Section 2.4 of KSR 2 picked up on Section 2.7 of KSR 1 by stating that the clarity sought by SFT had been satisfied by ITPD Volume 1, Section 2.5 (Reference Design and Mandatory Reference Design Requirements) and Appendix E (Reference Design Elements). However, as will be explained below, Section 2.5.3 raised questions regarding the significance of the Environmental Matrix.

The Invitation To Participate in Dialogue (ITPD)

ITPD Volume 1

3.73 In the lead up to the ITPD, NHSL produced mock Dialogue questions. These included: "What do you mean by Operational Functionality?", "What do you mean by Mandatory Elements of Reference Design?" and: "We don't use ADB for Room Data Sheets, we have our own Super Duper alternative. OK to use?" The proposed answers to these questions are set out in a Project

Steering Board report of 28 March 2013. The definition given for Operational Functionality reflects what is outlined in paragraph 3.78 of this paper, while Mandatory Requirements: “Comprises the information that defines Operational Functionality.” Regarding the question on ADB, the proposed response is: “This is at your risk; we would strongly advise ADB.” As discussed above, CEL 19 provided, at mandatory requirement 7, that ADB was a mandatory tool for the design of Scottish hospitals. If ABD was deemed inappropriate, and an alternative tool or approached is used, the responsibility is placed on the health board to demonstrate that the alternative is of equal quality and value in its application.

3.74 Section 2.2(b) of the BCRs placed an obligation upon the successful tenderer to ensure their design complied with CEL 19. No documents provided to bidders, as part of the ITPD, precluded bidders from using ADB to inform their design or from testing their proposed design against the ADB.

3.75 ITPD Volume 1 Revision A was issued on 11 March 2013. The final version, Revision B, included a definition of Operational Functionality and was issued on 17 April 2013.

3.76 The purpose of the ITPD was to describe the Board of NHSL’s needs and requirements, and set out how Competitive Dialogue would be conducted. ITPD Volume 1 contained: “background information on the Project, the conditions of participation…Draft Final Tender Requirements, envisaged Final Tender requirements”.

ITPD Volume 1, Sections 2.5 and Appendix E

3.77 Section 2.5 was titled ‘Reference Design and Mandatory Reference Design Requirements*’.* This section reiterated that the:

> “mandatory elements of the Reference Design…are those elements of the Reference Design relating to Operational Functionality. The definition

used in the NPD Project Agreement is being applied to define the agreed Operational Functionality".

3.78 This definition provided that Operational Functionality meant:

- the points of access to and within the development site and the buildings;
- the relationship between buildings;
- the adjacencies between different hospital departments;
- the adjacencies between rooms within the hospital departments;
- the quantity, description and spatial areas of specified rooms;
- the location and relationship of equipment, furniture, fittings; and
- the location of and the inter-relationships between rooms within departments

but only in so far as each of these above matters related to Operational Use.

3.79 Operational Use meant the use of a room to carry out Board Services. Board Services included clinical services.

3.80 This section continued:

"For the avoidance of doubt, the Board will not enter into any Dialogue on alternative solutions to the Mandatory Reference Design Requirements".

3.81 Section 2.5.3, titled 'Room Data Sheets', provided that:

"Standard format Room Data Sheets have not been prepared by the Board for the Project. The specific room requirements (the 'Room Information') are detailed in the following documents:

- The Board's Construction Requirements;
- The Environmental Matrix;

- The Schedule of Operational/Design Notes;
- The Equipment Schedule;
- The Equipment Responsibility Matrix;
- The Draft Schedule of Accommodation; and
- The Operational Functionality elements of the Reference Design."

3.82 This section continued:

> "Bidders will be required to develop Room Data Sheets, incorporating the Room Information".

3.83 Appendix E is titled 'Reference Design Elements' and sets out the full constituents of the Reference Design together with a note of each elements' mandatory/indicative status. However, the Environmental Matrix did not feature on Appendix E. Nor did any of the Room Information documents other than the Schedule of Accommodation. BREEAM featured as an indicative element of the Reference Design on Appendix E. However, Section 2.8 of ITPD Volume 1 provided that: "Bidder's designs must achieve, as a minimum, a 'Very Good' BREEAM rating under BREEAM 2011". Designs also had to achieve an 'Excellent' rating in accordance with BREEAM Section 6.0 ENE1. This was the provision of BREEAM 2011 that H&K advised was not practical and maybe not possible.

ITPD Volume 1, Section 2.6

3.84 Section 2.6, titled 'Indicative Elements of the Reference Design', provided that Building Services Engineering Solutions was an indicative element.

3.85 Section 2.6 provided that the: "full distinction between Mandatory Reference Design Requirements and indicative Elements of the Reference Design are set out in Appendix E". As set out in the previous paragraph, the Environmental Matrix did not feature on Appendix E as a mandatory or indicative element of the Reference Design.

ITPD Volume 1, Appendix A (ii)

3.86 This Appendix was titled ‘Submission Requirements’. Section C8.1 provided:

> “Bidders must submit proposals setting out the engineering services design for each element of the scheme in sufficient detail to demonstrate compliance with the Board’s Construction Requirements.”

The Board’s Construction Requirements are discussed below.

3.87 Section C8.3 provided:

> “Whilst Bidders are required to undertake their own design, the Board has provided a draft Environmental Matrix as part of the ITPD documentation. Bidders must confirm acceptance of the Board’s Environmental Matrix, highlighting any proposed changes on an exception basis”.

3.88 Section C10.1 provided that bidders must submit an energy model showing how their design fulfilled an ‘Excellent’ rating in accordance with BREEAM Section 6.0 ENE1.

ITPD Volume 3

3.89 ITPD Volume 3 Revision A was also issued in March 2013. The final version issued to bidders was Revision C from August 2013.

3.90 ITPD Volume 3 consisted of Part 6 Section 3 Sub-Sections A to E of the Schedule to the Project Agreement, otherwise called ‘the Board’s Construction Requirements’. These set out the key design criteria for the project, with the successful tenderer needing to satisfy all the requirements therein.

3.91 This volume departs from the language of ‘mandatory and non-mandatory/indicative’ elements and ‘Operational Functionality’ as used in the Reference Design and ITPD Volume 1. Instead, ‘mandatory’ refers to requirements contained in certain SG guidance and regulations, such as SHTM 03-01.

3.92 At the ‘Definitions and Abbreviations’ section, ‘Environmental Matrix’ is defined as meaning:

> “the Environmental Matrix, which details the room environmental condition requirements of the Board required within each department/unit/space/area…as set out in Appendix C of this Section 3…(as varied, amended or supplemented from time to time in accordance with the Project Agreement)”.

3.93 At Section 8 ‘Mechanical & Electrical Engineering Requirements’ it is stated that:

> “Project Co shall provide the Works to comply with the Environmental Matrix.”

3.94 In ITPD Volume 3, the terms of the Environmental Matrix are framed as the Board’s Construction Requirements, as opposed to being ‘indicative’ .

3.95 Section 2.3 ‘NHS Requirements’, provides that:

> “unless the Board has expressed elsewhere in the Board’s Construction Requirements, a specific and different requirement, the Facilities shall comply with but not be limited to the provisions of the NHS Requirements”.

These requirements include, at 2.3.v, that bidders shall:

"in relation to all SHTM…ensure that the Facilities comply with the requirements of such SHTM…and adopt as mandatory all recommendations and preferred solutions contained in such SHTM…"

3.96 Section 2.5 'Hierarchy of Standards' provided that:

"where contradictory standards/advice are apparent…then…(1) the most onerous standard/advice shall take precedence…The Board shall be entitled to make the final decision regarding the standards/advice to be used for the Facilities..."

3.97 Section 2.3.x provided that the successful tenderer shall achieve as a minimum a 'very good' rating under BREEAM 2011 and an 'Excellent' rating in accordance with BREEAM Section 6.0 ENE1. As previously discussed, this was the provision of *BREEAM 2011* that H&K advised was not practical and may not be possible. The Final Tender of IHSL reflected compliance with the provision.

3.98 At Section 5.26 'Energy Strategy', the successful tenderer required to: "provide Facilities that…Minimise internal areas requiring mechanical ventilation". At Section 8.7.8, 'Mechanical Ventilation & Air Conditioning' the need for mechanical ventilation to maintain comfort conditions was of: "paramount importance", and was to be achieved with minimum energy consumption in mind.

3.99 Section 3.6.3, headed 'Room Data Sheets' provided that Facilities must: "as a minimum, meet all the requirements specified in the Room Data Sheets included in Schedule Part 6 Section 6."

3.100 In response to an earlier draft of this paper, MML have told the Inquiry that: "reference to RDS within Volume 3 refers to the RDS that were to be designed in the future by the Preferred Bidder. Section 2.5.3 of ITPD Volume 1 makes clear that RDS were not prepared by the Board for the project or provided to bidders."

3.101 Section 8.7.22 is titled 'Ventilation and Air Conditioning of Isolation Rooms' and provides that: "Ventilation and air conditioning systems for these room shall be designed and installed in accordance with SHTM 03-01, 04-01 and NHS Model Engineering Specification C04." This statement is ambiguous in its phrasing. SHTM 04-01 concerns the design of water systems and control of legionella. SHPN 04 Supplement 1 provides guidance on specialised ventilation in isolation rooms. While the phrasing suggests reference to SHTM 04-01, the context indicates that the intention was to refer to SHPN 04 Supplement 1.

The Invitation to Submit Final Tender (ISFT)

3.102 On 16 December 2013, the Invitation to Submit Final Tender (ISFT) Volume 1 Revision A was issued. This was the final version issued to bidders.

3.103 In their final tender submission, one of the two unsuccessful bidders flagged air changes per hour and pressure regime data in the Environmental Matrix that was inconsistent with healthcare guidance.

The Preferred Bidder's Final Tender

3.104 In their Final Tender submission of 13 January 2014, IHSL confirmed that the:

> "mechanical and electrical services shall be provided in accordance with the reference design environmental matrix and we shall provide an addendum matrix for any rooms on an exception basis highlighting any changes at preferred bid stage."

3.105 The same document provided that: "air change rate…shall be in accordance SHTM-03". This was also reflected in IHSL's specification brief provided to the M&E sub-contractor to implement the design. The sub-contractor was to provide a ventilation system in accordance with: "all appropriate Hospital Technical Memoranda" and the documentation listed at Appendix A of the

brief. This included the ITPD Documentation, which included the Environmental Matrix.

3.106 IHSL also set out in the Final Tender their intention to proceed with a mixed mode, natural and mechanical, ventilation strategy in light of experiences from the adjacent ERI, which allowed a maximum internal temperature of 25°C. The Final Tender also refers to 4 ACH for bedrooms and ward areas.

4. Practical Implications for the RHCYP/DCN Project arising from the adoption of the Reference Design Approach

4.1 A Project Dashboard report of 13 May 2011 provided that the Design Team: "produced a programme showing a 12 month duration to complete the Reference Design based on the schedule of deliverables issued via NHSL…and on three rounds of consultation meeting with the clinical staff". This was reviewed. It was: "looked at in order to reduce the timescale to an eight month period, one agreement being that clinical consultation will be reduced to two rounds".

4.2 This Dashboard report was tabled and discussed at a Project Board meeting of 13 May 2011. It was noted that the programme outlined was unacceptable to NHSL, SFT and SGHD given the estimated slippage in operational date from the previous capital funded project. It was further noted that the: "Reference Design Phase whilst already reduced to two rounds of clinical interface at each design stage is to be reviewed again with a view to shortening it as far as practically possible".

4.3 SG policy set out in CEL 19 provided that: "the client must…not allow design time to be squeezed in order to recover time lost in the programme for other reasons".

4.4 In the same Project Board meeting of 13 May 2011: "SFT and SGHD expressed a strong view that the period indicated for 'Competitive Dialogue' did not reflect the production of a reference design and was based on an exemplar design. This period, in their view, needs review with a considerable reduction in duration likely."

4.5 At a Project Steering Board meeting of 9 November 2012: "SFT reiterated the need to create an attractive as possible proposition to the market given the

current economic situation. SFT continued that…there was an ever more pressing need to shorten the Competitive Dialogue process. The use of a Reference Design…should, in SFT's view, allow such a compression… MB [SG Deputy Director (Capital and Facilities) Mike Baxter] commented that Scottish Government's view was that of SFT's and that there is an established general market view prevailing that the current procurement programme for this project is too long causing difficulties when considering bid intentions." After much debate, NHSL, SFT and SGHD unanimously agreed to shorten the period for Competitive Dialogue from 209 days to 155 days. The Evaluation duration was also shortened from 75 days to 39 days. This was despite the Project Team having a number of concerns about the programme, given the complexity of the project. In July 2013, changes were made to the design brief for bidders following approved derogations from the provision of single room accommodation in DCN Acute Care. On 10 July 2011, the Project Steering Board agreed to lengthen Competitive Dialogue phase by eight weeks to give bidders more time to develop compliant designs.

4.6 Revision J of the Approach to Reference Design paper refers to practical implications of the Reference Design approach on the Reference Design Team. According to Revision J, the Reference Design Team were ring fenced for Reference Design development so they could be released to join bidding teams during the procurement stage. The Inquiry Team understand this solution was formulated in response to concern in June 2011 around the ability of Reference Design Team members to join bid teams. An email exchange on 24 June 2011 between NHSL Project Director Brian Currie and Associate Director of SFT Andrew Bruce suggests that Nightingale Associates and BMJ Architects threatened to withdraw from the Reference Design process if they could not bid for the project. The potential implications of this for the project timescale created significant concern.

4.7 According to Revision J, ring fencing the Reference Design team meant there was complete separation between the Technical Advisory Team (involved in the development of procurement and contract documents) and the Reference Design Team (engaged at arm's length to develop the Reference Design).

4.8 Revision J outlines that a Design Manager was appointed to provide the linkage so that the Reference Design Team prepared a solution that was consistent with that required by the Technical Advisory Team, without giving the Reference Design Team any understanding or involvement in the development of the procurement and contractual elements of the project. The Inquiry Team understands that David Stillie of MML was appointed to this role as Design Manager Architect and Thomas Brady of Davis Langdon as Design Manager M&E.

4.9 Revision J explained that, as the Reference Design Team were not to be retained by NHSL during the procurement period, it was envisaged that the Reference Design would be handed over to the Technical Advisory Team and actions would be taken to cover for the fact that the Reference Design Team would not be available to address queries during the procurement process.

4.10 It was proposed in Revision J that the Technical Advisory Team would need to take ownership of the design as if it was its own work. This would entail the two teams meeting regularly and the Technical Advisory Team undertaking a thorough and detailed review of the Reference Design.

4.11 In response to an earlier draft of this paper, MML have told the Inquiry that: "Prior to the Reference Design team's departure from the project, MML sought assurance that the Reference Design had been developed in compliance with applicable guidance." On 28 February 2012, Andy Duncan of MML wrote to Thomas Brady of Davis Langdon to seek this assurance. The email stated:

> "There is an action on the Reference Design Team to confirm that the Reference Design complies with NHS Guidance and key legislation. I attach the requirement schedule for each of the Reference Designers to respond to. We require a statement from each designer to confirm that the Reference Design complies with the Requirements Schedule. Should it not fully comply then each designer shall confirm that the Reference Design complies with the Requirements Schedule with a schedule of

derogations. We will need the compliance statement from the Reference Designers before they leave the project to work for potential bidders."

4.12 On 16 March 2012, Nightingale Associates, BMJ Architects, H&K and Arup issued a joint statement in response to this email: "relating to compliance generally and derogations." The document stated:

> "issues relating to compliance shall only be relevant in so far as the proposals have generally been required to be developed to an equivalent level of RIBA Stage C."

Beneath the heading 'Reference Design Compliance Statement Requirement', the following text appears:

> "Health Technical Memoranda and Scottish Health Technical Memoranda - We have followed SHTMs and also HTMs when there is no Scottish equivalent."

A full list of derogations is then included in the letter. There are no derogations relating to SHTM 03-01.

4.13 The Inquiry Team understands that this was the only occasion where environmental information within the Reference Design was officially reviewed and signed-off for compliance with healthcare guidance.

4.14 Concern around the ability of NHSL to technically evaluate bids when the Reference Design Team departed was raised by Associate Director of SFT Donna Stevenson in the meeting of 26 April 2012 between SFT and NHSL, where the Approach to Reference Design paper was discussed in detail. NHSL's response to the specifics of this point are not available. However, in an email from NHSL Project Director Brian Currie to Donna Stevenson on 16 May 2012, Mr Currie stated:

"Draft Evaluation criteria/ final submission requirements and scoring approach have now been prepared following workshops with Strategic (24/04) / FM (27/03) and D&C (0/4 & 01/05) work streams. To be presented to PME 24/5 before going to SFT for comment and NHSL Senior Management for final approval. Interim submission requirements being developed in parallel."

4.15 NHSL also: "received no correspondence recommending adjustment to this report [the Approach to Reference Design paper] or its recommendations from SFT."

4.16 The Inquiry Team understands that once Reference Design work was completed, and Davis Langdon left the project, the project management function transferred to MML, who were the only technical advisers working on the project. This is also the position adopted by the authors of the Grant Thornton Report, which reviewed the governance and internal controls over the RHCYP/DCN project, and whose findings were accepted by NHSL.

4.17 On 8 April 2013, NHSL provided an update on requirements for Operational Functionality. The update stated: "Through Dialogue Meeting 1 it became evident that the understanding of Operational Functionality required further clarification. Feedback was given to Bidders on their specific proposals."

4.18 At a Project Steering Board meeting of 10 July 2013, the Project Steering Board were reminded that: "the project team have communicated previously growing concern of the inadequacies of the programme to deal with the level of design development necessary for a major acute health facility regardless of the availability of a 'Reference Design'".

4.19 The minutes of a Special Project Steering Board on 22 August 2014 record that Mike Baxter (SG Deputy Director, Capital and Facilities): "asked if there was a common understanding of the requirements to sign off operational functionality and BC [Brian Currie of NHSL] responded that he didn't think this was the case". IHSL advised that they were being asked to deliver much more

than on other projects, and: “considerably more than was required for comfort of Operational Functionality”.

4.20 In September 2014, IHSL’s own Environmental Matrix was produced by Wallace Whittle (now part of TUV SUD UK Ltd), reflecting the ITPD Environmental Matrix.

4.21 The Board of NHSL commented on this in October 2014, noting for what appears to be the first time the discrepancy between the ACH for single bedrooms within the Environmental Matrix and those required by SHTM 03-01. IHSL advised this was intentional - the 4 ACH referred to mechanical ventilation only, and was intended to be supplemented by 2 ACH of natural ventilation from openable windows. IHSL believed this was what the Reference Design demanded, and this strategy was reflected in an Air Movement Report for Single Bedrooms produced by Wallace Whittle.

4.22 Mr Ian Stewart, of NHS NSS, advised Janette Richards (NHSL’s Lead HAISCRIBE Infection Prevention and Control Nurse) that he was:

“…surprised at reference to the use of openable windows. This could lead to ingress of unfiltered air or egress of infectious air that could find its way to a nearby openable window (whether or not in an isolation room) or to a nearby air intake. In short, have sealed windows as this will enable air flow patterns to be controlled.”

4.23 In January 2015, the Board of NHSL confirmed to MML that: “the design solution should not rely in any way with the opening windows”. This was almost five years after H&K first outlined that the design would be supplemented by opening windows, a strategy reflected at Guidance Note 14 of the first Environmental Matrices of 2010 – which formed the basis of the Environmental Matrix later supplied to prospective tenderers. A ventilation design supplemented by opening windows was also investigated by H&K as part of their 2012 Ward Room Thermal Room Comfort Analysis.

4.24 At Financial Close in February 2015, the Environmental Matrix was listed as Reviewable Design Data not approved by the Board and had to be re-submitted incorporating the Board of NHSL's comments under the Schedule Part 8 (Review Procedure) of the Project Agreement between NHSL and IHSL. None of the comments from the Board of NHSL at Financial Close related to ACH within the Environmental Matrix.

4.25 Despite the decision of the Board in January 2015 regarding single bedroom ventilation, and the categorisation of the Environmental Matrix as Reviewable Design Data in February 2015, the single bedroom ACH figures reliant on supplementary natural ventilation were not amended by IHSL in a later Environmental Matrix of 26 November 2015.

5. Provisional Conclusions

5.1 As outlined at the start, this paper seeks to set out the Inquiry Team's current understanding of the Reference Design adopted for the Project. It is provisional in nature. The paper does not constitute any findings of the Chair of the Inquiry. It is open to any CP to seek to correct and/or contradict the contents of the paper. However, unless that is done, in addition to such other findings in fact that Counsel considers appropriate, the Chair is likely to be invited by Counsel to the Inquiry to make the following findings in fact at the conclusion of the hearing scheduled for April 2023:

5.1.1 Prior to 17 November 2010, the project to replace the RHSC was proceeding as a capital funded project.

5.1.2 A team of technical advisers had been appointed by NHSL and significant design work had been undertaken.

5.1.3 On 17 November 2010, SG decided to change the funding structure of the RHSC project to an NPD funding model. NPD funding involves private finance being utilised for public sector projects with returns to the private sector being set at a capped level.

5.1.4 At the same point as the change in funding model, a decision was taken that the DCN should be co-located with the RHSC to form the combined RHCYP/DCN project.

5.1.5 SFT was responsible for assisting public sector bodies in Scotland with NPD projects.

5.1.6 NHSL determined that a 'Reference Design' should be utilised for the RHCYP/DCN project. This was intended to be shared with prospective tenderers in the procurement process and used as a springboard for bidders to develop their own designs.

5.1.7 A ‘Reference Design’ mandates elements that a tenderer must comply with. It can be contrasted with an ‘Exemplar Design’ which is but one potential design option and tenderers are given greater latitude to develop designs.

5.1.8 Historically, Exemplar Designs had been used for Public Private Partnership projects in Scotland.

5.1.9 NHSL, SFT and SGHD supported shortening the programme for producing the Reference Design as far as practically possible.

5.1.10 NHSL, SFT and SG wished to shorten the programme to avoid the potential for slippage in the project arising from the change in funding model.

5.1.11 NHSL had responsibility for determining the detail to be included within the Reference Design and, in particular, the elements with which compliance was mandatory.

5.1.12 CEL 19 provides guidance on the approach NHS Scotland bodies should adopt when designing a new hospital.

5.1.13 CEL 19 mandated that all NHS Scotland Bodies use the English Department of Health’s Activity Data Base (ADB) as a tool for briefing, design and commissioning. Where ADB was deemed inappropriate for a particular project, and an alternative tool was used, the NHS Scotland Body was required to demonstrate that the alternative was of equal quality and value to ADB in its application.

5.1.14 ADB would automatically comply with guidance and legislation applicable in England. The NHS Scotland body would need to ensure compliance with Scottish guidance, including SHTMs.

5.1.15 CEL 19 provides that design time must not be squeezed to recover time lost in a project for other reasons.

5.1.16 NHSL did not use ADB as a tool for the briefing and design stages relating to the environmental information for the RHCYP/DCN project.

5.1.17 The Inquiry has seen no documentation demonstrating: (i) why NHSL determined to deviate from using ADB; and (ii) why it considered that the alternative approach that it adopted was of equal quality and value to ADB.

5.1.18 The original Reference Design Team, in place when the project was to be capital funded, was retained by NHSL for the NPD project.

5.1.19 Members of the Reference Design Team were permitted to join a team tendering for the project.

5.1.20 The Reference Design Team were ring fenced and only dealt with the development of the design itself. The Reference Design Team were not involved in the development of the procurement documents or the contractual documents.

5.1.21 The services of the Reference Design Team were dispensed with by NHSL prior to the commencement of the procurement exercise. Accordingly, the Reference Design Team were not available to assist NHSL, or its technical advisers, during the procurement process.

5.1.22 Responsibility for the Reference Design was passed to the Technical Advisory Team when the Reference Design Team left the project.

5.1.23 Prior to the departure of the Reference Design Team, MML sought an assurance from the team that the Reference Design was compliant with NHS Guidance and appropriate legislation.

5.1.24 The Reference Design Team issued a joint document in response, stating that SHTMs (and HTMs where there was no Scottish equivalent) had been followed in producing the Reference Design.

5.1.25 This was the only occasion, prior to the conclusion of the contract with the preferred bidder, where ‘environmental information’ set out in the Reference Design concerning the proposed ventilation system for the hospital – including air changes per hour and pressure regimes - was formally reviewed and signed-off for compliance with healthcare guidance.

5.1.26 H&K produced an ‘Environmental Matrix’ for the project on 9 September 2010. This set out a range of environmental information including details of air changes per hour (ACH) and pressure regimes for various areas of the hospital. This formed the basis of a later Environmental Matrix produced by H&K, dated 19 September 2012, which was issued to prospective tenderers with the ITPD.

5.1.27 The Environmental Matrices stated that the document was an easier reference tool to replace ‘ADB RDS M&E’ Sheets.

5.1.28 There is currently no material available to the Inquiry indicating that the Environmental Matrices were produced using ADB.

5.1.29 On 2 June 2011, the Board of NHSL, with assistance from MML, decided that the Reference Design would set mandatory requirements in relation to ‘Clinical Functionality’. This was later redefined as ‘Operational Functionality’. Environmental information had not been included in the definitions of ‘Clinical Functionality’ or ‘Operational Functionality’.

5.1.30 The Environmental Matrix of 19 September 2012 was provided to prospective tenderers as part of the ITPD.

5.1.31 The Environmental Matrix provided with the ITPD contained environmental information that was inconsistent with healthcare guidance, namely SHTM 03-01, which outlines ventilation requirements in a hospital. In particular, values inserted in the Environmental Matrix for certain critical care areas did not comply with the guidance in SHTM 03-01.

5.1.32 ITPD Volume 1, Section 2.5.3 stated that tenderers were required to use the Environmental Matrix, and other 'Room Information' documents, to form the basis of Room Data Sheet production.

5.1.33 ITPD, Volume 3, Section 2.3 required tenderers to comply with SHTMs.

5.1.34 There was a lack of clarity in the procurement documents in relation to: (i) the purpose of the Environmental Matrix; and (ii) whether compliance with the Environmental Matrix was mandatory.

5.1.35 IHSL did not seek to change any of the values set out in the Environmental Matrix when it submitted its final tender.

5.1.36 One tenderer did seek to change values set out in the Environmental Matrix in its tender.

5.1.37 In October 2014, ACH for single bedrooms within IHSL's Environmental Matrix was flagged by the Board of NHSL as potentially non-compliant with SHTM03-01.

5.1.38 This was disputed by IHSL. IHSL maintained that it was proposing a mixed mode ventilation system – comprising of natural ventilation and mechanical ventilation - which complied with SHTM03-01.

5.1.39 NHS NSS corresponded with NHSL in relation to this dispute and expressed surprise that NHSL was considering having openable windows as part of the ventilation system.

5.1.40 In January 2015, the Board of NHSL determined that there should be no openable windows in the RHCYP/DCN.

5.1.41 This was not reflected in IHSL's Environmental Matrix submitted as part of its final tender.

5.1.42 Notwithstanding this disconnect between what the Board of NHSL wished and the solution being offered by IHSL, NHSL did not insist on any changes being made to IHSL's tender (including the Environmental Matrix submitted by IHSL) before a contract was signed.

5.1.43 NHSL entered into a contract with IHSL which stipulated that the Environmental Matrix would be 'Reviewable Design Data' under the contract. Therefore, the precise parameters for the ventilation system would be worked out after the contract was concluded.

SCOTTISH HOSPITALS INQUIRY

Provisional Position Paper 2

The Environmental Matrix for the Royal Hospital for Children and Young People and Department of Clinical Neurosciences

Purpose of the Paper

This Provisional Position Paper has been produced to assist the Chair in addressing the terms of reference. It outlines the Inquiry Team's understanding of the development of the environmental matrix utilised for the Royal Hospital for Children and Young People and the Department of Clinical Neurosciences (RHCYP/DCN).

An earlier draft of this paper was circulated to Core Participants (CP) for consideration and comment. Those comments have been considered by the Inquiry Team and taken into account in finalising this paper.

In due course, the Chair is likely to be invited by the Inquiry Team to make findings in fact based on the content of this paper. The Inquiry Team does not presently intend to lead further detailed evidence on the matters outlined in it with the exception of areas where the position is currently unclear. Therefore, some of the matters addressed in the paper will be touched upon to a greater or lesser extent in the hearing set to commence on 24 April 2023. In addition, it is open to any CP – through evidence or submissions – to seek to correct and/or contradict the content of the paper. It is therefore possible that the Inquiry's understanding of matters set out in the paper may change, and so the position set out in this paper remains provisional. If it is the case that the Inquiry Team's understanding does change significantly, a revised edition of this paper may be published in due course.

Contents

1. Introduction

1.1 NHS Lothian (NHSL) had responsibility for the RHCYP/DCN project. NHSL, with the assistance of its advisers, required to specify the technical requirements for the new hospital. This included briefing prospective tenderers on the technical requirements for key systems within the new hospital, including the ventilation system.

1.2 NHSL issued a document called an 'Environmental Matrix' (the EM) to prospective tenderers. The EM was essentially a spreadsheet that listed parameters for the ventilation system – including pressure and air changes per hour (ACH) - for various rooms in the new hospital. This paper seeks to address the purpose of the EM and how it was developed in the period from 2010 until the conclusion of a contract between NHSL and the preferred bidders (Integrated Heath Solutions Lothian (IHSL)) in February 2015. The paper also considers the ventilation specifications contained in the EM for key room types and compares this with published guidance, including Scottish Health Technical Memoranda (SHTM).

2. What is an Environmental Matrix?

2.1 An 'environmental matrix' is a spreadsheet that sets out a variety of technical parameters. This was addressed by Mr Stephen Maddocks, chartered building services engineer, in his oral evidence to the Inquiry on 12 May 2022. Mr Cantlay of Mott MacDonald Limited (MML), in his oral evidence to the Inquiry on 20 May 2022, described an 'environmental matrix' as:

> "…a spreadsheet which is pulling together all the environmental parameters into a single list against rooms so that they're all…in one place."

2.2 An 'environmental matrix' is different to a 'room data sheet'. The concept of a 'room data sheet' is addressed by Mr Maddocks at paragraph 3.3.2 of his

report dated 10 April 2022. An example of a 'room data sheet' is included in Appendix A of Mr Maddocks' report.

2.3 A 'room data sheet' is a multi-page document that sets out the requirements, including environmental requirements, for a specific room or space in a building. There would be a separate room data sheet for each room or space in a building. In contrast, an 'environmental matrix' lists all of the environmental parameters for spaces in the building in one table.

2.4 'Room Data Sheets' can be produced by way of a computer programme. For example, the Department of Health in England operated the 'Activity Database' (ADB), to assist with designing a hospital. ADB is a computer software package that assists healthcare planners, architects and teams involved in the briefing, design and equipping of healthcare environments. Content for ADB is developed from technical guidance such as Health Building Notes and Health Technical Memoranda (HTM). SHTMs are the Scottish equivalent of HTMs.

2.5 A room data sheet produced using ADB would comply with the requirements of HTMs because the room data sheet would automatically be populated with environmental parameters – including air changes per hour and pressure requirements - from the database. The database includes detailed information for various types of room required for a hospital. As long as the correct room type is selected, the room data sheet will be populated with the parameters set out in HTMs.

2.6 An environmental matrix is created by values being manually entered into a spreadsheet. The spreadsheet is not automatically pre-populated with values from a database. Accordingly, an environmental matrix would not automatically comply with published guidance such as HTMs. Such compliance would depend on the robustness of the process adopted for determining the values to be input into the spreadsheet. There is scope for errors to arise in the creation an environmental matrix. For example, transcription errors.

2.7 In his report, Mr Maddocks describes room data sheets as "…the most critical design document" when designing a new hospital. In his oral evidence, Mr Maddocks described room data sheets, created using the ADB system, as "best practice". He considered that presenting technical specifications for a hospital in an alternative way, such as by way of a spreadsheet, could "lead to misunderstanding."

3. CEL 19 (2010) and The Policy on Design Quality for NHSScotland

3.1 The Scottish Government (SG) imposed a mandatory requirement on all NHS bodies to use the ADB system, or a suitable equivalent, as the tool for the briefing, design and commissioning stages of any new hospital project. This is addressed in Provisional Position Paper 1 on the Reference Design for the RHCYP/DCN from paragraph 3.12 onwards. A summary of the position is set out below.

3.2 This requirement was set out in HDL (2006) 58. The policy was updated by way of a Chief Executive Letter issued in 2010 (CEL 19). CEL 19 includes a document called 'A Policy on Design Quality for NHSScotland' (the Design Quality Policy). CEL 19 remained extant for the duration of the RHCYP/DCN project.

3.3 Mandatory requirement 7 of the Design Quality Policy states that:

> "All NHSScotland Bodies engaged in the procurement of both new-build and refurbishment of healthcare buildings must use and properly utilise the English Department of Health's Activity DataBase (ADB) as an appropriate tool for briefing, design and commissioning.

[If deemed inappropriate for a particular project and an alternative tool or approach is used, the responsibility is placed upon the NHSScotland Body to demonstrate that the alternative is of equal quality and value in its application.]

3.4 The Design Quality Policy also contains a section entitled ‘Activity DataBase (ADB)’ which states that:

> “Activity DataBase (ADB) is the briefing, design & commissioning tool for both new-build and refurbishment of healthcare buildings. It is a briefing and design package with an integrated textual and graphical database, an interface with AutoCAD and an extensive graphical library - the complete tool for briefing and design of the healthcare environment. ADB is produced by the Department of Health in England and is mandated for use in Scotland by the Scottish Government Health Directorates as the preferred briefing and design system for NHSScotland (see Mandatory Requirement 7 of this Policy). It has been developed to assist in the construction, briefing development, design and alteration of healthcare facilities.
>
> Spaces designed using ADB data automatically comply with English planning guidance (such as Health Building Notes (HBNs) and Health Technical memoranda (HTMs) as ADB forms an integral part of the English guidance publication process. Whilst Scottish users can create their own project-specific briefs and designs using ADB's extensive library of integrated graphics and text which includes room data sheets, room layouts and departmental room schedules, extreme care should be taken to ensure that such data generated by the package are consistent and compliant with Scottish-specific guidance such as Scottish Health Planning Notes, Scottish Health Facilities Notes (SHFNs) and Scottish Health Technical Memoranda (SHTMs) as published by Health Facilities Scotland.”

3.5 A responsibility was therefore placed on NHSL to utilise ADB, or an equivalent tool, for the briefing, design and commissioning of the hospital. If NHSL determined that the ADB system was inappropriate for the RHCYP/DCN project as a briefing, design and/or commissioning tool, an obligation was placed on NHSL to demonstrate that the alternative tool adopted was of equal quality and value to the ADB system.

4. SHTM03-01: Ventilation for Healthcare Premises, Part A – Design and Validation

4.1 SHTMs are the Scottish equivalent of HTMs. SHTM 00 is entitled 'Best practice guidance for healthcare engineering – policies and principles'. It states that the aim of the guidance is to ensure that everyone concerned with the management, design, procurement and use of a healthcare facility understands the requirements of the specialist, critical building and engineering technology involved.

4.2 The content of SHTM03-01 sets out guidance on ventilation for health care premises. The detailed content of SHTM03-01 was addressed at the hearing in May 2022.

4.3 SHTM03-01 was not in place in the early stages of the project. It was first issued in October 2011. Prior to that, the relevant Scottish Guidance was set out in SHTM2025 (which did not include an equivalent of Table A1 in SHTM03-01, which sets out environmental parameters for rooms or departments requiring specialised ventilation).

4.4 Paragraph 1.2 of SHTM03-01 states that it provides "comprehensive advice and guidance" to healthcare managers and design engineers on specialist ventilation in healthcare settings. Section 7 is entitled "Specialised ventilation systems". Paragraph 7.2 provides that specialised ventilation is required for "critical areas and high-dependency units of any type". Paragraph 7.3 states

that design information is provided in Table A1. Paragraph 7.13 notes that air change rates are specified in the Table in A1.

4.5 Table A1, in Appendix 1, provides guidance on technical parameters, including air changes per hour and pressure regimes, for various areas of a hospital. Table A1 states that a ‘General Ward’ requires six air changes per hour. A ‘single room’ requires six air changes per hour. ‘Critical care areas’ require 10 air changes per hour. SHTM03-01, Appendix A, does not list parameters for every possible room. For example, there is no entry for a “4 bed room”.

5. The Purpose of the Environmental Matrix

5.1 NHSL did not utilise room data sheets, created using ADB, as a tool for briefing of prospective tenderers on its requirements for the ventilation system. The Inquiry Team understands that the EM was utilised as a substitute at the procurement stage.

5.2 This is set out in emails between Hulley & Kirkwood (H&K), who created the original EM, and BAM Construction (The original Principal Supply Chain Partner for the project) in 2010:

> ‘With regards to environmental issues, rather than employ ADB M&E sheets, HK will produce Environmental Matrix spreadsheet for each room type for easy reference as a user sign off tool.’ [15 February 2010]

> ‘This document is intended as an easier tool to replace ADB RDS M&E sheets for the elements covered in the matrix.’ [8 September 2010]

5.3 The EM was issued to prospective tenderers at both the Invitation to Participate in Dialogue (ITPD) stage and the Invitation to Submit Final Tenders (ISFT) stage of the procurement exercise. The ITPD stated certain room data sheets would be require to be submitted as part of the tender

process. However, a full set of room data sheets would only need to be created by the preferred bidder before financial close.

5.4 The ITPD also set out the Board's Construction Requirements (BCR). Section 2.2(b) of the BCR included a requirement that the design complied with CEL 19. Given this stipulation, and CEL 19's requirement for the ADB system to be utilised as a tool for briefing and design, it is not clear to the Inquiry Team why NHSL also sought to issue the EM to prospective tenderers.

5.5 It is not clear to the Inquiry Team precisely when NHSL determined that room data sheets, created using the ADB system, would not be utilised at the briefing stage of the RHCYP/DCN project. It is also not clear why this decision was taken given the guidance set out in CEL 19.

5.6 CEL 19 places a responsibility on NHSL to demonstrate that any alternative briefing tool to ADB is of equal quality and value in its application to room data sheets created using ADB.

5.7 H&K were asked by the Inquiry Team to confirm how it was demonstrated that the EM was of equal quality and value to ADB. H&K have advised the Inquiry Team that this relates to information outwith H&K's knowledge.

5.8 To date, no documentation has been provided to the Inquiry that demonstrates that NHSL considered CEL 19 or the NHS Design Quality Policy at the time the decision was taken to utilise the EM as a briefing tool for the project. It is not clear to the Inquiry Team what basis NHSL had for considering: (i) that the use of the ADB system was inappropriate for the briefing stage of the project; and (ii) that the EM would be as effective as the ADB system for the purposes of the briefing stage.

5.9 To date, no information or documentation has been provided to the Inquiry that suggests that the EM was of equal quality to room data sheets created using ADB. The Inquiry Team's provisional view is that the EM was not of a similar quality to room data sheets produced using the ADB system. That is

because the EM was a spreadsheet that was not automatically populated with information held on a database of technical information that complied with HTMs and/ or SHTMs. This gave rise to the potential for errors, including transcription errors, to arise.

5.10 NHSL maintains that tenderers required to produce room data sheets using ADB and to ensure compliance with CEL 19 and published guidance including SHTM03-01. These matters will require to be explored with witnesses at the April 2023 hearings.

6. Development of the Environmental Matrix for the RHCYP/DCN Project

The Creation of the EM

6.1 The EM for the RHCYP/DCN project was originally developed by H&K. H&K are a firm of mechanical and electrical engineers. H&K have informed the Inquiry that the EM was created by information being manually input to a spreadsheet by a qualified engineer. The EM was not created using the ADB system or any similar computer software system.

6.2 As described above, the EM is a spreadsheet setting out technical information concerning the ventilation system in the hospital. In addition to that, there is a 'Guidance Notes' section and a 'Comments Summary Section'. Thereafter, there are entries for various areas in the hospital. For example, 'Critical Care/HDU/Neonatal Surgery'. Each type of room in the proposed hospital is given a separate line entry under the heading 'Room Name'. Columns are provided for environmental data. This includes entries for:

- Temperature
- Relative Humidity (removed 03/02/2012)
- Heating
- Cooling
- Cooling Type

- Ventilation including type, supply air changes per hour (ac/hr), extract ac/hr, relative pressure, minimum filtration
- Safety temperatures – surface, water
- Lighting

6.3 Information such as department code, department name, department sub-group and room name, quantity (of a particular room type), area (this was removed in later versions) and notes are also included. From 2012 onwards, another column was added for 'room function' and a separate sheet was included in the EM called 'Room Function Reference Sheet'. This is addressed in section 8 of this paper, 'Reference Design development for RHSC-DCN project procured under NPD: 2012'

6.4 Technical specifications are aligned to the function of each room. For example, the environmental conditions required to make an operating theatre safe and comfortable for its users differ from those needed for rooms without special clinical requirements.

6.5 The starting point in creating the EM was the 'Schedule of Accommodation' (SoA). The SoA is a spreadsheet containing: (i) the departments; (ii) room types within each department; and (iii) the number, and square metreage, of each specific room type. A schedule of accommodation is typically produced by a specialised healthcare planner, and is the end-product of close dialogue with the clinicians who will be working at the prospective hospital. In particular, the clinicians will inform the healthcare planner of their room requirements within specific departments, which will then be translated into a schedule format by the healthcare planner. The Schedule of Accommodation used for H&K's EM was initially prepared by Tribal, healthcare planners to the Project under Frameworks Scotland. Versions of the EM produced by H&K in 2012 used the SoA prepared by NHSL.

6.6 The EM contains guidance notes at the beginning of the document which refers to NSS guidance, building standards and other NHSL requirements.

From 2012 onwards, every line entry in the 'notes' column of the EM contains the instruction "See Guidance Notes"[1].

6.7 While the EM provided very specific technical information relating to different departments, other design documents such as design briefs and Clinical Output-based Specifications gave an overview of the clinical services intended for each department, and the considerations that tenderers design teams needed to take into account to allow the facilities to meet the needs of users and enable services to run safely and efficiently. This included high-level information relating to environmental conditions, and reference to design guidance. These documents were produced at an early stage of the project by clinical task sub-groups, and signed off by the Clinical Management Team, the Project Clinical Directors, and the Project Sponsor. Clinical Output Specifications were included in the Invitation to Participate in Dialogue (ITPD) Volume 3, which set out the Board's Construction Requirements.

The Stages of Development

6.8 There were five versions of the EM created by H&K. Thereafter, the EM was developed by prospective bidders. From the point the preferred bidder (IHSL) was appointed, the preferred bidder took over development of the EM.

6.9 The table below provides a summary of the development of the EM at different stages of the project.

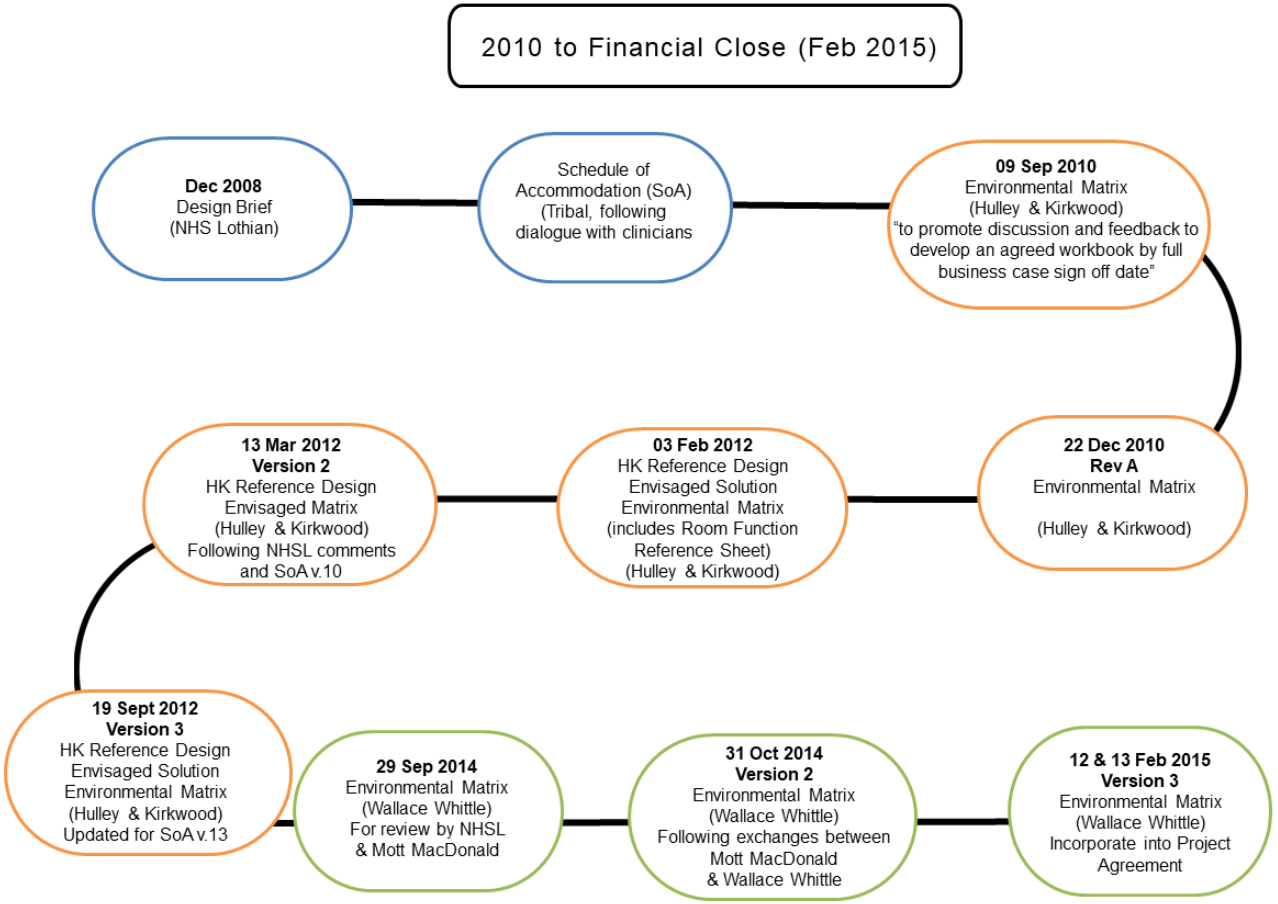
Stage of Project	Party Responsible for the EM	Comments
2010: RHSC Project under Frameworks Scotland	H&K, subcontracted by BAM, who were the principal consultants under Frameworks Scotland.	• 09/09/10 "First Issue" • 22/12/10 "RDS Environmental Matrix updated in accordance with Tribal SoA[2] Sheets Version 8. H&K Scheme Design Update"

[1] The 2010 versions contained more specific instructions in the notes column.
[2] SoA – Schedule of Area or Accommodation

Stage of Project	Party Responsible for the EM	Comments
2012: Reference Design development for RHCYP/DCN project procured under NPD	H&K as part of the reference design team (commissioned by Davis Langdon, a sub-contractor of MML) This version was reviewed by NHSL Estates.	• 03/02/12 "First Issue Based of Schedule of Area V8" • 13/03/12 "Second Issue Based on Schedule of Area V10 Ward Room T Max Reduced from 28 to 25 Degrees Celsius Revised to suit NHSL Comments" • 19/09/12, "Third Issue Based on Schedule of Area V13"
March 2013 – Jan 2014 Competitive Dialogue and final tender submission	The bidder's design teams. Bidders were asked to confirm acceptance of NHSL's Environmental Matrix, highlighting any proposed changes on an exception basis.	
2014: Further development of Preferred Bidder's design proposals up to Financial Close	IHSL was appointed as preferred bidder. Multiplex were contracted by IHSL for the design, procurement, construction and commissioning of the Works. Wallace Whittle, were the Mechanical and Engineering design consultants to Multiplex. MML provided comments on behalf of the Board. The EM was not approved by NHSL at Financial Close, and was subject to the Reviewable Design Data process.	• 29/09/14 (revision) • 31/10/14 (revision) • 14/02/15, "Financial Close"

ENVIRONMENTAL MATRIX

For the Royal Hospital for Children and Young People and Department for Clinical Neurosciences, Edinburgh



SCOTTISH HOSPITALS INQUIRY

7. RHSC Project under Frameworks Scotland: 2010

7.1 The EM was originally created in 2010, when the project was restricted to the re-provision of the Royal Hospital for Sick Children (RHSC), which was being procured under Frameworks Scotland. Frameworks Scotland was a procurement programme managed by Health Facilities Scotland (HFS) through which HFS selected a number of Principal Supply Chain Partners (PSCP) who would then be available to partner with NHS bodies on healthcare projects. NHS bodies could choose one of these PSCPs rather than conducting a lengthier, standalone, procurement exercise.

7.2 BAM Construction, one of Framework's Scotland's PSCPs, was appointed Principal Supply Chain Partner for the RHSC Re-Provision project on 10 July 2009. NSHL and BAM negotiated the contract for the delivery of stages 3 and 4 of the project, which involved design development and assistance in preparing for the Full Business Case, and the completion of design, construction and handover of the project.

7.3 The Project Manager was Fraser McQuarrie from Davis Langdon and the Supervisor was David Stillie of MML. BAM's Mechanical and Electrical Engineering Design consultant was H&K. The healthcare planner was Tribal. Although the contract was only concluded in 2010, work on the project began before the conclusion of the contract.

7.4 In June 2009, a RACI[3] matrix was produced, showing which parties were responsible, accountable, consulted and informed of different elements of the project, including the design. According to this matrix, the PSCP was responsible and accountable for undertaking the design of the project, and co-ordinating and managing the design process and design teams. The Board of NHSL was responsible and accountable for developing the clinical

[3] RACI stands for 'responsible, accountable, consulted, informed'.

brief, carrying out the clinical review of BAM's design and advising and issuing all NHSL policies to the PSCP for design requirements. NHSL was accountable for managing the clinical review of BAM's design but the advisers were responsible for this. Advisers were also both responsible and accountable for many aspects of reviewing BAM's design, including scrutinising BAM's design and construction information on all technical matters relating to the project.

7.5 In December 2009, BAM prepared a programme for Stage 3 of the project (development of design and preparation for the full business case), which included an activity schedule. According to this schedule, H&K was responsible for Concept Design, Scheme Design and Detail Design and Market Testing. Responsibilities under Scheme Design including amongst other things "Services Input into RDS & C Sheets". The Inquiry Team understands that RDS stands for Room Data Sheets (which are addressed at paragraph 5 above).

7.6 On 15 February 2010, Michael O'Donnell from H&K wrote to David Muir of BAM, copying in other design team members, providing feedback on the Stage 3 Programme. Under the heading 'HK Scheme Design' Mr O'Donnell wrote:

> "With regards to environmental issues, rather than employ ADB M&E sheets, HK will produce Environmental Matrix spreadsheet for each room type for easy reference as a user sign off tool."

7.7 On 2 July 2010, in an email to Graeme Brodie the Architectural & Technical Services Manager for BAM Construction, Michael O'Donnell described the approach H&K would take to control the maximum temperature in different rooms of the hospital on the hottest summer day. This email introduces a figure of four air change rates for bedrooms.[4] Mr O'Donnell noted that for a

[4] Ventilation has an effect on the temperature of a room, similar to the cooling effect of a breeze. The higher the air change rate (written as ac/hr) or air flow, the cooler the room becomes (without an additional source of heating).

typical bedroom to meet the HTM 03-01 criteria of a 18°C to 28°C float range, HTM recommends 6ac/hr through mechanical supply or natural ventilation (or both) and stated that:

> "Design Solution for RHSC- Dynamic Simulation Modelling we have carried out in previous schemes show that with around 4ac/hr of cooled supply air to for example a typical ward room can maintain such conditions. Normally, extract is achieved through en-suites. This would be supplemented by opening windows for natural ventilation."

7.8 For High Dependency Units (HDU), Mr O'Donnell stated that:

> "Design Criteria - HBN 57 gives specific guidance as well as HTM 03-01 - esp Appendix 2 for air change rates - 10ac/hr S&E[5], 18°C to 25°C control range.
>
> The department should be air conditioned and controlled on a zonal basis.
> Design Solution for RHSC - With 10ac/hr of cooled supply and extract air and with multiple zoned ducted reheat batteries on supply to critical care wards/individual/zoned rooms it is possible to maintain such conditions. Central AHU plant requires humidification."

7.9 Therefore, at the preliminary stages of the project, H&K was aware of the need for HDU and critical care areas to have 10 air changes per hour.

7.10 H&K issued the first EM in September 2010. The Guidance Notes section stated that:

> "1. This workbook is to promote discussion and feedback to develop an Agreed Workbook by FBC sign off and is intended as an easier

[5] Supply and Extract. Extract systems tend to be used to remove contaminated air or air containing odour, whereas supply systems are used to supply fresh air to a room, when the air movement in the room needs to be controlled.

reference tool to replace ADB RDS M&E Sheets for elements described on these sheets"

7.11 The first EM contained a number of potential inconsistencies with the guidance set out in HTM 03-01: Specialised Ventilation for Healthcare Premises. (The Scottish version of this guidance, SHTM 03-01: Ventilation for healthcare premises, was not yet available and SHTM 2025: ventilation in healthcare premises, did not contain recommendations for air change rates.)

7.12 The tables below replicate relevant columns of the EM with the recommendations from HTM 03-01 given in bold where they vary from those given in the matrix. These tables show extracts relating to certain rooms and are not intended to be a comprehensive list of all incidences in the EM where figures potentially vary from those in published guidance including HTM 03-01 (SHTM 03-01 not being in existence in 2010).

B1 Critical Care/HDU/Neonatal Surgery

Room Name	Temperature		Ventilation					Notes
	Design max deg C	Design min deg C	Type	Supply ac/hr	Extract ac/hr	Relative Pressure	Min filtration	
Open Plan Bay (4 beds)	25	18	S&E **S**	10	10 **0**	Balanced **Positive**	F7	See p.2 guidance notes - Note 13
Single Bed Cubicle	28 **25**	18	S	4 **10**	0	positive	G4 **F7**	See p.2 guidance notes - Note 13

Guidance note 13 states: "The internal temperature in mechanically ventilated rooms shall not exceed the maximum temperature as listed on these Environmental Matrices provided external summer design criteria is not exceeded."

C1 InPatient Pathway/ Ward Care

Room Name	Ventilation					Notes
	Type	Supply ac/hr	Extract ac/hr	Relative Pressure	Min filtration	
4 Bed Room[6]	S	4 **6**	0	Positive **Balanced or negative**	G4	See p.2 guidance notes – Note 5
Bedroom – single	S	4 **6**	0	Positive **Balanced or negative**	G4	See p.2 guidance notes – Note 5

Guidance note 5 states: "Ventilation air change rates and the use of natural ventilation in Patient Areas shall be reviewed throughout the detail design process to ensure a maximum internal temperature of 28°C (dry bulb) is not exceeded for more than 50 hours per year during norm occupancy as listed in HTM 03-01 Clause 2.15."

7.13 The Open Plan Bays (with four beds) in Critical Care were given air change rates consistent with those outlined in HTM 03-01. However, the ventilation type and pressure regime were inconsistent with HTM 03-01. For single-bed cubicles, the air change rates, maximum temperature and minimum filtration were all inconsistent with HTM 03-01.

7.14 For single-bed rooms and multi-bed rooms in 'InPatient Pathways/Ward Care', the air change rates and pressure regime was inconsistent with the recommendations in HTM 03-01.

7.15 The ventilation design solution is explained in guidance note 14 and reiterates H&K's approach to controlling temperature:

[6] SHTM 03-01 does not specify the requirements for multi-bed rooms. According to HFS advice received from NHSL these are to be treated the same as single bedrooms. The 2011 and 2013 versions of Activity Database room data sheets confirm this.

"**Typical bedroom:** Design Criteria - HTM 03-01 Clause 2.15 - internal temperatures in patient areas should not exceed 28°C db for more than 50 hrs per year. Appendix 2 HTM 03-01 gives 18°C to 28°C float range. Design Solution for RHSC- Dynamic Simulation Modelling shall show that with around 3 to 4 ac/hr of cooled supply air to for example a typical ward room can maintain such conditions. Normally, extract is achieved through en-suites. This would be supplemented by manually opening windows for natural ve [ventilation]

HDU bed areas – Design criteria HBN 57 gives specific guidance as well as HTM03-01 – esp Appendix 2 air change rates 10 ac/hr S&E, 18°C to 25°C control range. (Capability shall be provided but not at the summer and winter external ambient design extremes)

…

Design solution for RHSC – With 10 ac/hr of cooled supply and extract air…to critical care wards…

…

Critical Care areas – Design Criteria – HTM03-01 – esp Appendix 2 for air change rates – 10 ac/hr S&E…"

7.16 The guidance note above correctly identifies the parameters for high dependency units and critical care areas.

7.17 The second version of the EM was produced in December 2010. The air change rate for single bed cubicles in Critical Care was corrected to 10 ac/hr, but the ventilation type, relative pressure, minimum filtration and maximum temperature were all potentially inconsistent with recommendations in HTM 03-01.

B1 Critical Care/HDU/Neonatal Surgery

Room Name	Ventilation					Notes
	Type	Supply ac/hr	Extract ac/hr	Relative Pressure	Min filtration	
Open Plan Bay (3 beds)	S & Ex **S**	10	10 **0**	Balanced **Positive**	F7	See p.2 guidance notes - Note 13
Single Bed Cubicle	S & Ex **S**	10	10 **0**	Balanced **positive**	G4 **F7**	See p.2 guidance notes - Note 13

7.18 Neither iteration of the EM by this stage of the project provided detail regarding the sub-departments with 'InPatient Pathways/Ward Care', for example, the Haematology/Oncology department, which provides services for neutropenic patients and thus has specialist clinical requirements.

8. Reference Design development for RHSC-DCN project procured under NPD: 2012

8.1 On 17 November 2010, the SG introduced a policy change and announced that RHSC would be funded under the Non-Profit Distribution (NPD) model. With the change in funding, it was also decided that the Department of Clinical Neurosciences (DCN) would be co-located with the RHSC.

8.2 The change in the method of funding necessitated a change in the structure of the project. Rather than appointing a contractor to design and build the hospital, a project agreement required to be put in place. This required a standalone procurement exercise to be conducted which complied with the relevant statutory regulations (the Public Contracts (Scotland) Regulations 2006 and thereafter the Public Contracts (Scotland) Regulations 2012). In the circumstances, NHSL adopted the competitive dialogue procedure. The Inquiry Team's provisional understanding of the competitive dialogue procedure, in relation to the development of the EM, is set out in section 10 of this paper, 'The Environmental Matrix during Competitive Dialogue'.

8.3 The decision was made to follow a Reference Design approach, which had implications for the extent of design development to be undertaken by a)

NHSL's advisers in advance of procurement, and b) bidders during competitive dialogue.

8.4 The reference design approach is the subject of a separate paper produced by the Inquiry Team. However, in essence, a reference design provides bidders with certain fixed requirements which the contracting authority considers are mandatory (otherwise, the 'mandatory elements'). This can be contrasted with an exemplar design which provides one possible solution but tenderers have the ability to submit alternative solutions.

8.5 NHSL appointed MML as Technical Adviser, for the revised project with the new funding model, on 22 March 2011. According to the 'Technical Adviser Scope' included in the contract, MML would, amongst other things, manage and co-ordinate the review of any design proposals against the scheme brief during the preparation of the Business Cases, lead on the preparation of Reference Design documentation, and check the Reference Design for compliance with all appropriate NHS and legislative guidelines and requirements and identify any derogations.

8.6 MML contracted Davis Langdon as sub-consultant on 10 May 2011. According to the 'Technical Adviser Scope', included in the sub-consultancy agreement, Davis Langdon would, amongst other things, act as Lead Technical Adviser and point of contact for NHSL, and prepare the 'Invitation to Partake in Dialogue' [sic] including Output Specification, Payment Mechanism etc.

8.7 MML and Davis Langdon appointed H&K to the Reference Design Team on 11 July 2011. H&K's role was Services Engineer, with the following responsibilities (amongst others):

- Developing the environmental information to use for Room Data Sheets
- Input to Building Research Establishment Environment Assessment (BREEAM) pre-assessment workshops and provision

of preliminary ‘evidence’ as necessary, relating to requirement for a BREEAM ‘excellent’ rating.[7]

- Support BREEAM pre assessment with M&E Strategy Drawings and Statements, Energy strategy and schedules of power, heating and cooling loads, Engineering design philosophy.
- Review and advise the client on the engineering services requirement elements contained within the ADB room data sheets.
- Review architects proposals for compliance with section 6 (energy) of the Scottish Building Regulations and SHTM 07-02: Encode – making energy work in healthcare.
- Determine the mechanical services system philosophies, including on natural ventilation and mixed mode ventilation.

8.8 The change in the funding model occurred at a point where significant design work had already been undertaken. The Inquiry Team has seen no documentation which suggests that NHSL, or its design team, re-appraised whether an environmental matrix was the correct approach for the revised project when the design team was re-appointed.

8.9 H&K produced three further iterations of the EM, now called ‘HK Reference Design Envisaged Solution Environmental Matrix’. According to H&K, the information contained in the EM was derived from reference to SHTM/HTM/HBN Guidance current at the time of the reference design (2011/2012) and Reference Design client briefing information, as referred to within the Guidance Notes page of the matrix.[8] SHTM 03-01 was issued in October 2011.

8.10 The ‘HK Reference Design Envisaged Solution Environmental Matrix’ introduced the ‘Room Function Reference Sheet’ (RFRS). The RFRS is essentially a summary of room types that occur in the matrix. It was intended

[7] BREEAM is a method of assessing, rating and certifying the sustainability of buildings
[8] A40151858 H&K response to EM paper, p.23.

to be used to facilitate design review and refine inputs. An extract from the Room Function Reference Sheet is reproduced below:

Room Function Reference Sheet

The following table details reference templates which are used to populate cells within the environmental matrix. Refer to individual department sheets for individual room environmental conditions.

Room Function	Temperature		Ventilation					Notes
	Design Max deg C	Design Min deg C	Type	Supply ac/hr	Extract ac/hr	Relative Pressure	Min Filtration	
Bedroom	25	20	Central Supply Air	4	0	Positive	G4	See Guidance Notes
Changing Facilities	28	18	Central Supply and Extract	5	4	Positive	G4	
HDU	25	18	Central Supply Air	10	0	Positive	F7	See Guidance Notes
Multi-bed Wards	25	18	Central Supply Air	4	0	Positive	G4	See Guidance Notes
Isolation lobby	25	18	HBN4 Dependent	HBN4 Dependent	HBN4 Dependent		F7	See Guidance Notes
Isolation bedroom	25	21	HBN4 Dependent	HBN4 Dependent	HBN4 Dependent	Balanced	F7	See Guidance Notes
Operating Theatre Recovery	25	18	In line with SHTM 03-01	In line with SHTM 03-01	In line with SHTM 03-01	Balanced	F7	See Guidance Notes
Recovery Bay/ Recovery Room	28	20	Central Supply and extract	4	0	Positive	G4	See Guidance Notes

8.11 As noted in the sub-heading of the Room Function Reference Sheet, the room function reference sheet acted as a ‘reference template’ used to “…populate cells within the department sheets for individual room environmental conditions”. A new column for ‘room function’ was added to the department sheets.

8.12 Not all of the ‘room functions’ set out in the EM appear in HTM 03-01 or SHTM 03-01. For example, there is no ‘Application’ listed in Appendix 2 of HTM03-01, or Table A1 of SHTM 03-01, for the terms ‘Multi-bed ward’ or ‘HDU’. HTM 03-01 and SHTM 03-01 include various ‘Applications’ including: ‘General Ward’; ‘Critical Care Areas’; and ‘Neutropenic patient’. None of these appear as ‘room functions’ in the RFRS.

8.13 It is not clear to the Inquiry Team how the creator of the EM determined what ‘Room Functions’ should be included, how they should be named, and how parameters should be ascribed to the stated ‘room functions’.

8.14 For rooms in various departments in the hospital, it is not clear how a ‘Room Function’ was chosen from the RFRS. In particular, it is not clear to the Inquiry Team if this was a decision taken by an engineer acting in isolation or whether there was clinical input into this decision. This is relevant because there are various ‘Room Functions’ whereby the creator could face a range of options. For example, area B1 is given the department name ‘PICU and HDU’s – 24 Beds’. It is an area where critical care will be provided. There are a range of department sub-groups and room names in the EM for B1. One room names is ‘Open Plan Bay (4 beds)’. The ‘Room Function’ of ‘Multi-bed wards’ is set out in the EM. It is not clear to the Inquiry Team why this ‘Room Function’ was chosen rather than ‘HDU’. It is a general ward but it is a general ward in a critical care area.

8.15 The issues outlined above will require to be explored with witnesses at the hearing in April 2023.

8.16 The first issue of the 'Reference Design Envisaged Solution Environmental Matrix' dated 3 February 2012, was reviewed by NHSL's Estates Team. The following comments were received via email on 7 March 2012.

Environmental matrix

1. NHSL guidance states that all general medical/clinical areas temp design max of 25°C.Critical Care, theatres up to 28°C, Burns & Plastic Dressings may be higher.
2. Localised control +/- 2C.
3. Comfort cooled will be by AHP.

8.17 The Second Issue, dated March 2012, was revised to align with SoA10 as well as the comments from NHSL's Estates Team. The Third Issue, dated September 2012, was revised in accordance with SoA 13 which arose after the Reference Design Deliverables had been completed.

8.18 No comments were provided by NHSL highlighting any potential problem with the 'Room Function' ascribed to any room in the hospital. That included critical care areas where the values in the EM were potentially lower than those stated in HTM 03-01 and SHTM 03-01.

8.19 The table below contains selected extracts from the department sheets of the third issue of the 2012 EM, which is the version ultimately shared with prospective tenderers.

8.20 The department sheets contained a number of potential inconsistencies with published guidance, including SHTM 03-01. Where figures in the department sheets differ from the parameters and values contained in SHTM 03-01, or SHPN 04-01 Supplement 1 for isolation rooms, the recommended figures have been put in bold.

Selected Extracts from the Environmental Matrix third issue 2012[9]									
Dept Name	**Dept Sub Group**	**Room Name**	**Room Function**	**Ventilation**					**Notes**
				Type	**Supply ac/hr**	**Extract ac/hr**	**Relative Pressure**	**Min Filtration**	
B1 PICU and HDUs	PICU – 8 beds	Single Bed Isolation Cubicle	Isolation Bedroom	HBN4 Dependent **SHPN4 supp1**	HBN4 Dependent **SHPN4 supp1**	HBN4 Dependent **SHPN4 supp1**	Balanced	F7	See Guidance Notes
		Gowning lobby	Changing Facilities **Isolation lobby**	Central Supply and Extract **Supply**	5 **69**	4 **0**	Positive	G4 **F7**	See Guidance Notes
		Single Bed Cubicle	Bedroom **Critical Care Areas (Corresponds with 'HDU' on RFRS)**	Central Supply Air	4 **(10)**	0	Positive	G4 **F7**	See Guidance Notes

[9] Not intended as a comprehensive list of all examples of where figures differ from parameters and values contained in SHTM 03-01.

Selected Extracts from the Environmental Matrix third issue 2012[9]									
Dept Name	**Dept Sub Group**	**Room Name**	**Room Function**	**Ventilation**					**Notes**
				Type	**Supply ac/hr**	**Extract ac/hr**	**Relative Pressure**	**Min Filtration**	
		Open Plan Bay (4 beds)	Multi-bed Wards **Critical Care Areas (Corresponds with 'HDU' on RFRS)**	Central Supply Air	4 **(10)**	0	Positive	G4 **F7**	See Guidance Notes
	High Acuity – 6 beds	Single cot cubicle	Bedroom **Critical Care Areas (Corresponds with 'HDU' on RFRS)**	Central Supply Air	4 **(10)**	0	Positive	G4 **F7**	See Guidance Notes
		Single Bed Isolation Cubicle	Isolation Bedroom	HBN4 Dependent **SHPN4 supp1**	HBN4 Dependent **SHPN4 supp 1**	HBN4 Dependent **SHPN4 supp 1**	Balanced	F7	See Guidance Notes
		Gowning Lobby	Isolation Lobby	HBN4 Dependent	HBN4 Dependent	HBN4 Dependent	0	F7	See Guidance Notes

Selected Extracts from the Environmental Matrix third issue 2012[9]									
Dept Name	**Dept Sub Group**	**Room Name**	**Room Function**	**Ventilation**					**Notes**
				Type	**Supply ac/hr**	**Extract ac/hr**	**Relative Pressure**	**Min Filtration**	
				SHPN4 supp1	**SHPN4 supp 1**	**SHPN4 supp 1**			
		Open Plan Bay (4 beds)	Multi-bed Wards **Critical Care Areas. Corresponds with 'HDU' on RFRS**	Central Supply Air	4 **(10)**	0	Positive	G4 **F7**	See Guidance Notes
C1.1 Medical Inpatients	Medical	Single Bedroom	Bedroom	Central Supply Air	4 **(6)**	0	Positive **balanced or negative**	G4	See Guidance Notes
		4 Bed Room	Multi-bed Wards[10]	Central Supply Air	4 **(6)**	0	Positive **balanced or negative**	G4	See Guidance Notes

[10] SHTM 03-01 does not specify requirements for 4 bed rooms, however ADB room data sheets c.2011 show same requirements as Single room.

Selected Extracts from the Environmental Matrix third issue 2012[9]									
Dept Name	**Dept Sub Group**	**Room Name**	**Room Function**	**Ventilation**					**Notes**
				Type	**Supply ac/hr**	**Extract ac/hr**	**Relative Pressure**	**Min Filtration**	
C1.4 Haematology /Oncology Inpatients and Daycases	Paedia-tric Beds	Single Bedroom	Bedroom **Neutropenic Patient ward. No correspon-ding room function on RFRS**	Central Supply Air	4 **(10)**	0	Positive	G4 **H12**	See Guidance Notes
	Day Facilitie s	Multi Bed Room: day care, 4 beds & 2 chairs	Multi-bed Wards **Neutropenic Patient ward. No correspon-ding room function on RFRS**	Central Supply Air	4 **(10)**	0	Positive	G4 **H12**	See Guidance Notes

Selected Extracts from the Environmental Matrix third issue 2012[9]									
Dept Name	**Dept Sub Group**	**Room Name**	**Room Function**	**Ventilation**					**Notes**
				Type	**Supply ac/hr**	**Extract ac/hr**	**Relative Pressure**	**Min Filtration**	
P1 Combined theatres	RHSC Patient Pre-Discharge Areas	Post Anaes-thetic Recovery	Recovery Bay/ Recovery Room **Only one type of recovery room in SHTM 03-01. Operating Theatre Recovery on RFRS**	Central Supply and Extract	4 **(15)**	0 **(15)**	Positive **balanced**	G4 **F7**	See Guidance Notes

8.21 Each line entry contains the instruction ‘see guidance notes’. For Critical Care/HDU, as well as post theatre recovery areas, the information contained in the guidance notes differed from that contained in the department sheet. Guidance Note 15 states:

> **“HDU bed areas** - Design Criteria - SHTM 03-01 - esp Appendix 1 for air change rates - 10ac/hr S&E, 18°C to 25°C control range.(Capability shall be provided but not at the summer and winter external ambient design extremes).
>
> The department should be air conditioned and controlled on a zonal basis.
>
> Central AHU plant requires humidification to achieve RH range during winter (HBN 57 Clause 4.60).
>
> **Critical Care areas** - Design Criteria - SHTM 03-01 - esp Appendix 1 for air change rates - 10ac/hr S&E, 18°C to 25°C control range.(Capability shall be provided but not at the summer and winter external ambient design extremes). NHSL may require specific rooms to have a control range up to 28°C.
>
> Central AHU plant requires humidification to achieve RH range during winter (HBN 57 Clause 4.60).
>
> **Post theatre recovery areas** - Design Criteria - SHTM 03-01 - esp Appendix 1 for air change rates – 15 ac/hr S&E , 18°C to 25°C control range. (Capability shall be provided but not at the summer and winter external ambient design extremes against the maximum and minimum range conditions)."

8.22 It is not clear why values were inserted into the EM which did not conform to the statements made in the Guidance Notes. This issue will need to be explored with witnesses at the April 2023 hearings diet.

8.23 The room functions ascribed to rooms in key departments do not reflect the range of rooms requiring specialised ventilation described in SHTM 03-01. For example, SHTM 03-01 provides specific requirements for Critical Care Areas and Neutropenic[11] patient wards. In the EM bedrooms and multi-bed rooms in the critical care department and the haematology/oncology ward (which accommodates neutropenic patients) respectively have been given the room function 'bedroom' and 'multi-bed ward'. The corresponding environmental data for bedroom and multi-bed ward does not meet the same air changes, pressure regime and filtration recommended for these more specialised areas.

8.24 The room function reference sheet did in fact contain a room function 'HDU' that corresponded with the recommendations contained in SHTM03-01, but this room function was not assigned to any of the rooms listed in the 'department sheets'.

8.25 Similarly, the room function 'operating theatre recovery' which corresponded with 'recovery room' in SHTM 03-01 wasn't assigned to the 'post-anaesthetic recovery' area. Instead, a different room function with less onerous ventilation specifications was used.

8.26 This version of the EM also retained the ventilation figures for single and multi-bed rooms which were potentially inconsistent with the air change rates and pressure regime outlined in HTM 03-01 and SHTM 03-01. This version of the EM does not refer explicitly to a mixed mode ventilation strategy although Guidance Note 5 states, "Ventilation air change rates and the use of natural ventilation in Patient Areas shall be reviewed throughout the detail design process to ensure a maximum internal temperature of 25°C (dry bulb) is not exceeded during normal occupancy."

[11] Neutropenia is a condition characterised by abnormally low levels of white blood cells. The condition can increase the risk of infections.

8.27 The use of 4 ac/hr for bedrooms outside of Critical Care areas was referred to in H&K's report titled 'Ward Room Thermal Comfort Analysis' in February 2012, which showed that "the internal temperatures in ward rooms can be maintained at comfortable levels with 4 ACH (air changes per hour) of cooled fresh air supply mechanical ventilation and could be controlled in summertime between 22°C and 25°C maximum." The implication of this, according to the report, was that the design was not reliant on natural ventilation to keep the rooms at the required temperature. The report did not analyse "critical care and high dependency type ward rooms which receive air change rates in the region of 10 ACH".

8.28 In February 2012, H&K also produced a report titled "Reference Design Stage Section 6 SBEM Compliance Report Revision A". The report was prepared "in order to demonstrate that the proposed Reference Design envisaged energy approach and envelope performance criteria for the Royal Hospital for Sick Children/Department of Clinical Neurosciences building could be compliant with the 2010 version of Section 6 Energy of the Scottish Building Regulations." Section 6 outlines SG's carbon emission reduction requirements. According to the report these requirements could be met if, amongst other things, the "ventilation solutions as aligned to the RHSC-DCN Matrix" were incorporated into the design of the hospital.

8.29 In March 2012, H&K produced a paper titled 'M&E Reference Design Approach' which referred to the use of natural ventilation. It stated that:

> "The ventilation systems to the Hospital shall be designed in accordance with Health Technical Memorandum SHTM 03-01. Ventilation shall be provided to suit both the operational and statutory requirements of the development. Although the development will be designed to maximise the use of natural ventilation, it is intended that rooms will not be reliant on natural ventilation alone, unless they comply with maximum temperature limits listed in the RDS Environmental Matrices."

8.30 The paper included an 'Encode checklist' to check for compliance with SHTM 07-02 which is titled 'Encode - making energy work in healthcare' and provides guidance on reducing energy use in the healthcare sector. This contained questions about the use of natural ventilation and mixed mode ventilation:

3. Design integration		
Has every effort been made to include renewables?	✓	Reference Design PiP Sustainability Statement
Can thermal storage, heat recovery, free cooling he used to minimise services further?	✓	Refence Design - Included where beneficial and clinical functionality allows
Has natural ventilation been optimised to minimise services?	✓	As above

6. Ventilation		
Has every effort been made to use a natural ventilation strategy?	✓	where clinical function permits -NDP solution to be reviewed
If natural ventilation is not possible, can a mixed-mode approach be used?	✓	NDP solution to be reviewed
If mixed-mode ventilation is not possible then has every effort been made to use the most efficient ventilation in accordance with Health Technical Memorandum guidance	✓	NDP solution to be reviewed
Has every effort been made to avoid humidification and/or dehumidification?	✓	NDP solution to be reviewed
Has night cooling been considered?	✓	Considered not suitable for a 24hr acute hospital
For full fresh air systems, has ventilation heat recovery been incorporated?	✓	Reference Design Anticipated Approach
Where mechanical plant is essential, is it the most efficient possible?	✓	NDP solution to be reviewed
Is ductwork designed to give low pressure drops?	✓	NDP solution to be reviewed
Does the ventilation design have effective controls (including variable speed drive (VSDs), good zoning and local user controls)?	✓	NDP solution to be reviewed

The report indicates that mixed mode ventilation was always part of the strategy for the ventilation system.

9. Ensuring Compliance with SHTM03-01

9.1 MML have advised the Inquiry Team that prior to the reference design team's departure from the project, MML sought assurance that the Reference Design had been developed in compliance with applicable guidance (see paragraph 4.11 of the Provisional Position Paper on the Reference Design).

9.2 On 28 February 2012, Andy Duncan of MML wrote to Thomas Brady of Davis Langdon to seek this assurance. The email stated:

> "There is an action on the Reference Design Team to confirm that the Reference Design complies with NHS Guidance and key legislation. I attach the requirement schedule for each of the Reference Designers to respond to. We require a statement from each designer to confirm that the Reference Design complies with the Requirements Schedule. Should it not fully comply then each designer shall confirm that the Reference Design complies with the Requirements Schedule with a schedule of derogations. We will need the compliance statement from the Reference Designers before they leave the project to work for potential bidders."

9.3 On 16 March 2012, Nightingale Associates, BMJ Architects, H&K and Arup issued a joint statement in response to this email: "relating to compliance generally and derogations." The document stated:

> "issues relating to compliance shall only be relevant in so far as the proposals have generally been required to be developed to an equivalent level of RIBA Stage C."

9.4 Beneath the heading 'Reference Design Compliance Statement Requirement', the following text appears:

> "Health Technical Memoranda and Scottish Health Technical Memoranda - We have followed SHTMs and also HTMs when there is no Scottish

equivalent."

A full list of derogations is then included in the letter. There are no derogations relating to SHTM 03-01.

9.5 The Inquiry Team understands that this was the only occasion where environmental information within the Reference Design was officially reviewed and signed-off for compliance with healthcare guidance. The assurance was provided in March 2012. However, the version of the EM that was issued with the ITPD was not completed until 19 September 2012.

9.6 It is not clear to the Inquiry Team what basis the reference design team had for providing the assurance that they did. In this paper, the Inquiry Team has highlighted potential inconsistencies between the environmental matrix and published guidance including SHTM 03-01. This issue will require to be explored at the hearing commencing in April 2023.

10. The Environmental Matrix during Competitive Dialogue

10.1 The 'Reference Design Envisaged Solution – RHSC/DCN Environmental Matrix version third issue' was shared with prospective tenderers who were invited to take part in competitive dialogue. Competitive dialogue is a method to identify the bidder whose proposals will best satisfy the contracting authority's requirements. This is accomplished through regular meetings and communications with prospective tenderers to discuss and clarify the requirements for the project and potential proposals to meet them.

10.2 At the beginning of the process, prospective tenderers were issued with the ITPD, which was made up of four separate volumes and multiple appendices. Two volumes of the ITPD are particularly relevant with regard to the EM. Volume 1 contains instructions to bidders, specifically: "background information on the Project, the conditions of participation, the arrangements

for the Dialogue, the Informal Submissions that Bidders must provide during the Dialogue Period, Draft Final Tender requirements, envisaged Final Tender requirements and how the Board intends to evaluate the Final Tender, award the Project and communicate with Bidders." Volume 3 contains the Board's Construction Requirements. Volume 3 was accompanied by a suite of documents making up the appendices.

10.3 An 'Important Notice' at the start of ITPD volume 1 explained that:

> "Any summaries or descriptions of documents or contractual arrangements contained in any part of the Invitation cannot be and are not intended to be comprehensive, nor any substitute for the underlying documentation (whether existing or to be concluded in the future), and are in all respects qualified in their entirety by reference to them."

10.4 Paragraph 2 was entitled "Pre-construction phase". It stated that:

> "2.2 Room layouts are to be prepared using ADB to include fully loaded 3D views"

10.5 In ITPD Volume 1, the EM is defined as "the matrix contained in ITPD Volume 3, Schedule Part 6, Section 3, Appendix C". ITPD Volume 3 defines the EM as:

> "…the Environmental Matrix, which details the room environmental condition requirements of the Board required within each department/unit/ space/area. The title is Reference Design Envisaged Solution – RHSC/ DCN Environmental Matrix version third issue as set out in Appendix C of this Section 3 (Board's Construction Requirements) of Schedule Part 6 (Construction Matters) (as varied, amended or supplemented from time to time in accordance with the Project Agreement)"

10.6 The EM is referred to twice in Volume 1: in Section 2 "Technical Overview" and Appendix A (ii) Submission Requirements.

10.7 Section 2, which contains an overview of the technical requirements of the project, explains that the specific requirements for the facilities are set out in the Board's Construction Requirements, but that "certain elements of the design as they relate to Operational Functionality are mandatory". The following sub-sections go on to describe mandatory elements as well as the indicative elements of the reference design. The mandatory elements, listed in Appendix E, relate to minimum room areas, points of access, room layouts and adjacencies[12].

10.8 Section 2.5.1 addresses the Schedule of Accommodation and Reference Design Schedule of Accommodation. Section 2.5.2 addresses Room Layouts. In these sections, bidders were informed of which design documents and drawings had already been included in the Reference Design, and what the bidders would need to develop themselves during Competitive Dialogue, and, if they were selected as preferred bidder, before Financial Close. Paragraph 2.5.2, explains that bidders would be required to develop 1:50 layout drawings for specific rooms in the hospital. A list of these rooms is provided in the document.

10.9 Following on from that, paragraph 2.5.3 on Room Data Sheets states:

> "Standard format Room Data Sheets have not been prepared by the Board for the Project. The specific room requirements (the 'Room Information') are detailed in a combination of the following documents:
>
> - The Board's Construction Requirements;
> - The Environmental Matrix;
> - The Schedule of Operational/Design Notes;
> - The Equipment Schedule;
> - The Equipment Responsibility Matrix;
> - The Draft Schedule of Accommodation; and

[12] Which areas need to be close to other areas for the most effective patient flows.

- The Operational Functionality elements of the Reference Design.

During Dialogue Bidders will be required to develop Room Data Sheets, incorporating the Room Information, for those rooms for which 1:50 layout drawings have been prepared. For the avoidance of doubt this shall include all Key Rooms and Generic Rooms in addition to those rooms identified in the table at paragraph 2.5.2 above. The Room Data Sheets will form part of the Bidders proposals. The Preferred Bidder will be required to complete Room Data Sheets for all remaining rooms prior to Financial Close."

10.10 Appendix A (ii) – Submission Requirements, sets out what bidders were required to include in their technical submissions, and how these were to be set out. Technical submissions for Approach to Design and Construction (Section C) would ultimately form part of the preferred bidder's proposals in accordance with the NPD Project Agreement.

10.11 The EM is mentioned in C8, M&E Engineering Design Proposals. C8.1 states that

"Bidders must submit proposal setting out engineering services design for each element of the scheme in sufficient detail to demonstrate compliance with the Board's Construction Requirements."

10.12 C8.2 asks bidders to set out how their design would be developed to meet certain requirements and asks for an 'environmental conditions/room provisions matrix for both mechanical and electrical services for each room in the Facilities'. C 8.3 states:

"Whilst Bidders are required to undertake their own design, the Board has provided a draft Environmental Matrix as part of the ITPD documentation. Bidders must confirm acceptance of the Board's Environmental Matrix, highlighting any proposed changes on an exception basis."

10.13 In Volume 3, which set out the Board's Construction requirements, the EM is mentioned in relation to general construction requirements and mechanical and electrical engineering requirements. It is defined as:

> "…the Environmental Matrix, which details the room environmental condition requirements of the Board required within each department/unit/ space/area. The title is 'Reference Design Envisaged Solution – RHSC/ DCN Environmental Matrix version third issue' as set out in Appendix C of this Section 3 (Board's Construction Requirements) of Schedule Part 6 (Construction Matters) (as varied, amended or supplemented from time to time in accordance with the Project Agreement)"

10.14 Volume 3 states:

> "Paragraph 5 General Construction Requirements
> 5.3 Thermal Requirements,
> c) The building fabric shall include passive design measures to limit summer temperatures to figures given within the Environmental Matrix;
>
> Paragraph 8 Mechanical & Electrical Engineering Requirements
> Project Co shall provide the Works to comply with the Environmental Matrix.
> …
> Project Co shall take cognisance of all the building services implications of the requirements described in the Board's Construction Requirements of this Schedule Part 6 Section 3 Sub-Section D (Specific Clinical Requirements) and Sub-Section E (Specific Non-Clinical Requirements).
>
> For the avoidance of doubt the hierarchy of standards and advice detailed in paragraph 2.5 shall apply to this paragraph 8."

10.15 Paragraph 8.1 also specifies minimum engineering standards and includes reference to SHTM 03-01, as well as "publications in paragraph 2 of this Sub-Section C Project Wide Requirement" which includes amongst others

requirements “Adherence to the requirements set out in CEL 19 (2010) A Policy for Design Quality for NHSScotland, 2010 Revision published by the Scottish Government”.

10.16 Paragraph 8.5.2 is entitled ‘Thermal Comfort’. It states that:

> “Where maximum internal summer time temperature calculations indicate that the internal temperature will exceed those limits set out in the Environmental Matrix, Project Co shall provide means of reducing the temperature rise.”

10.17 Clinical Output Based Specifications were also included within the ITPD Volume 3 (Board’s Construction Requirements), Schedule Part 6, Section 3, Sub-Section D (Specific Clinical Requirements). The Inquiry Team understands that these seek to describe the clinical requirements for different parts of the hospital. The Clinical Output Based Specification for Critical Care Areas contained the following information is set out in paragraph 1.8:

- Flexibility in the use of the Critical Care beds for both High Dependency and Intensive Care is key to maintaining efficient use of high specification beds. All three critical care areas must be co-located

- Single cubicles will be used for privacy or isolating ordinary infectious conditions

- Lobbied single bed isolation cubicles are required for both source and protective isolation of patients and they all require to have identical design of pressure control with positive pressure lobbies with filtered air, and negative extraction cubicles. It is required that contaminated air must not flow back into any of the open Critical Care areas. It is required that the lobby must be joined to the room at the foot end of the bed.

- All PICU and HDU bed spaces are required to be of the same specification to allow greatest flexibility of use.

10.18 The Clinical Output Based Specifications for Critical Care also listed the following design guidance:

- HBN 23: Hospital Accommodation for Children & Young People
- HBN 57: Facilities for Critical Care
- SHTM 2025: Ventilation
- SHFN 30: Version 3: Infection Control
- SHTM 61: Flooring
- HBN 14: Pharmacy
- Paediatric Intensive Care Society Standards Document published in 2001

10.19 The ITPD was issued to bidders on 11 March 2013, marking the start of competitive dialogue, which lasted until 13 December 2013 when bidders were invited to submit their final tender. By the time that the ITPD was issued, SHTM 2025 had been superseded by SHTM 03-01.

10.20 The relevant draft proposals of tenderers were submitted in April 2013, for review and feedback.

10.21 M&E Engineering was discussed at Dialogue Meeting 2, which was held in May. It is not clear to the Inquiry Team whether there were any significant discussions with tenderers regarding the EM during the competitive dialogue stage. This issue will require to be explored at the April 2023 hearings.

10.22 The Inquiry Team understands that one bidder – Bidder C – submitted a marked up version of the EM during the procurement process. This sought to amend some of the entries to reflect Bidder C's ventilation strategy, 'to enhance the proposed design criteria or to adjust values based on intended

room use'. Bidder C changed the air change rates for single bed cubicles and open plan bays in the PICU (Paediatric Intensive Care Unit) and Low Acuity department sub-groups from 4 ac/hr to 10 ac/hr. For single bed cubicles and open plan bays in the Neo-Natal and High Acuity department sub-groups Bidder C modified the air change rates to 6 ac/hr.

10.23 During Competitive Dialogue Bidder C had also requested to "explore the acceptability" of their ventilation strategy which would deliver "a lower air flow than the 6 air changes/hour specified in SHTM 03" and "review the specialist ventilation strategy for clinical areas" such as isolation rooms, including the "application of isolation room guidance to Critical Care single rooms". In their final tender Bidder C wrote, "we have proposed a lower air flow of four air changes/hr (which have been agreed in dialogue meetings, despite being lower than those specified in SHTM 03)…These will result in a similar air flow to the provision of four air changes/hr included in the reference design."

10.24 Bidders were required to submit a list of assumptions and derogations outlining where their proposals varied from the Board's Construction Requirements. Bidder C included a "clarification" with respect to Section 8: Mechanical & Electrical Engineering Requirements: "Project Co shall provide the Works to comply with the Environmental Matrix", referring NHSL to their own (Bidder C's) amended environmental matrix.

10.25 It is not clear whether this was discussed by NHSL and its advisers. It is also not clear to the Inquiry Team why all tenders were deemed to comply with the specified criteria when one tenderer was offering to provide a different solution to that set out in the EM issued with the ITPD and ISFT. These issues will require to be explored at the April 2023 hearings.

11. The Environmental Matrix at Final Tender Stage

11.1 IHSL submitted its final tender on 13 January 2014. IHSL was selected as the preferred bidder by NHSL. In its final submission for section C8 'Clarity, Robustness and Quality of M&E Engineering Design Proposals' it stated that the "…Mechanical, Electrical and Public Health Services are designed to provide efficient, safe, secure services in accordance with the Brief, British Standards, CIBSE guides and NHS guidance documents".

11.2 IHSL also stated that the outline designs have "…been reviewed for compliance with SHTMs" (C8.1 i).

11.3 In section C8.2, the EM is addressed:

> "C8.2 (x) Environmental Conditions Room Matrix
>
> The mechanical and electrical services shall be provided in accordance with the reference design environmental matrix and we shall provide an addendum matrix for any rooms on an exception basis highlighting any changes at preferred bid stage.
> …
> Environmental Conditions:
> We have followed the reference design and have utilised the reference design matrix to compile the room environmental proposal drawings…
>
> The room temperature set points, air change rate and ands [sic] shall be in accordance SHTM 03 [sic] and lighting information as CIBSE guide LG2."

11.4 A table was included that sets out typical rooms. HDU is specified as requiring 10 air changes per hour. That was not replicated in all the entries in EM although this was stated in the Guidance Notes section at the front and there were a number of entries stating "See Guidance Notes".

11.5 Section C8.3 stated:

> "C 8.3 Environmental Matrix
>
> As indicated above no changes proposed at this time nor envisaged in the future but we will continue to review and advise back. The solutions are refenced on the Heating, Ventilation and Cooling strategy drawings, sequence 521, 524 and 525 recorded in AP1.1 Section 5.1 Mechanical Drawing Schedule."

11.6 IHSL did not submit their own 'room conditions matrix' in the form of a marked up version of the 'reference design envisaged solution EM' as they did not propose any changes.

11.7 IHSL described a mixed mode ventilation strategy in their final tender submission for Building Services Deliverables at paragraph 5.9. IHSL sought to maximise natural ventilation where appropriate including "examples of simulations that were carried out to reach a final solution". One of those referred to an approach for a single bedroom, as follows:

> "Single Bedroom Ward, South Facing Exposed (Summer) with mixed mode ventilation
> Opening windows – restricted opening to 100mm.
> Supply air provided if the room air temperature is great than 25°C.
> External air 4 ACH cooled to 18°C.
> No reliance on uncontrolled infiltration for cooling."

11.8 It was proposed that all ward rooms adopt a mixed mode approach (paragraph 5.9.6.4 of IHSL's submission for 'Building Services Deliverables).

11.9 Draft room data sheets were produced by IHSL in October 2013. These concerned certain key and generic rooms. The room data sheets for rooms in Critical Care/HDUs appear to replicate the environmental data contained in the EM which is potentially inconsistent with SHTM 03-01. For example, the

room data sheet for area B1 ‘PICU and HDU’s’ stated a value of 4 air changes per hour for “4 beds low acuity” notwithstanding that the room was in a High Dependency/Critical Care area of the hospital. Table A1 of SHTM 03-01 indicates that such areas should have 10 air changes per hour. It is not clear to the Inquiry Team if these were submitted along with the final tender.

11.10 IHSL stated that the ventilation system complied with published guidance including SHTM03-01:

> “The ventilation systems to the Hospital are designed in accordance with Scottish Health Technical Memorandum [sic] SHTL 03-01. Ventilation shall be provided to suit both the operational and statutory requirements of the development” (paragraph 5.9.7)
>
> “The M&E specifications shall comply with SHTMs and general healthcare guidance notes…” (paragraph 5.12.2)

11.11 It is not clear to the Inquiry Team how IHSL could have stated that there would be compliance with SHTM 03-01 and compliance with the EM (given that the EM contained values – including critical care areas – that do not appear to comply with SHTM 03-01). This issue will require to be explored with witnesses at the hearing commencing in April 2023.

12. The Environmental Matrix in the period from the Appointment of the Preferred Bidder to Financial Close

12.1 After being selected as the preferred bidder, IHSL became responsible for developing the design of the ventilation system. The Inquiry Team understands that the EM was not to be included in the Project Agreement as reviewable design data as the preferred bidder was to develop a full set of room data sheets before financial close. Therefore, the EM should have been superseded as a briefing and design tool by financial close. However, the requirement for a full set of room data sheets to be produced by financial close was waived by NHSL and the EM came to be included as reviewable design data within the contract. The reasons for this decision being taken will require to be explored with witnesses at the hearing in April 2023. As a result of the decision, the Inquiry needs to understand the development of the EM in the period to financial close.

12.2 On 3 July 2014, Multiplex requested a copy of the EM which had been prepared by NHSL and which formed part of the ITPD. Ken Hall, M&E Design Manager of Multiplex asked specifically for a version in Excel format to allow Stewart McKechnie of TUV SUD/Wallace Whittle to populate the matrix with any changes. MML acceded to the request on 11 July 2014.

12.3 According to the minutes of a Project Management Group Meeting held on 27 August 2014, Liane Edwards of MML, “advised that during a review of the Environmental Matrix a number of discrepancies have been uncovered impacting on RDS [Room Data Sheet] production and requested input from NHSL. IHSL to raise RFI”. RFI is a commonly used acronym for ‘Request for Information’ literally, an information request to another party usually using a standardised template such as a register.

12.4 The minutes of the Project Management Group meeting on 3 September 2014 note, ‘RDS [Room Data Sheet] schedule on the basis of generic and specialist rooms to be proposed by IHSL for agreement by Board’.

12.5 At a Project Delivery Group (PDG) meeting attended by representatives from NHSL and IHSL on 12 September 2014, it was noted:

> “RDS list with Board for review. Board have comments and will forward shortly. Target approval 30th September 2014.”
>
> ‘Environmental Matrix: IHSL to confirm proposed format and integration with RDS. It was noted the IHSL environmental matrix is to be read in conjunction with RDSs as available at FC and supplemented through the RDD process during the construction phase.’

12.6 Draft room data sheets dated 18 September 2014 were prepared by HLM, a member of IHSL’s consortia. These show single cubicles and open plan bays to have 4 ac/hr which corresponds with the ‘department sheets’ in the EM but is potentially inconsistent with SHTM 03-01. These contain some differences from the room data sheets submitted during dialogue in October 2013. Specifically, ventilation type has been changed from central supply air to natural and central supply air for rooms other than the isolation room. The single bed cubicle and ‘open plan bay: 3 cots’ were also shown to have extract via en-suite.

12.7 On 25 September 2014, Colin Macrae, Senior Building Services Engineer at MML emailed Graeme Greer and Maureen Brown (MML) with initial comments on IHSL’s EM, which had been prepared by Wallace Whittle and is 14 September 2014. These identify a number of areas where the figures provided on the EM differ from those stated in SHTM 03-01. For example, bedroom air changes per hour were stated to be four when SHTM03-01 stated six. An issue around the pressure regime for bedrooms was also identified. Wallace Whittle issued a revised EM on 29 September 2014.

12.8 This iteration of the EM was in Excel format. The guidance notes section was retained. A version of the RFRS was included in a tab called ‘Room Function Reference Sheet’. This was not an exact copy of the version issued with the ITPD and ISFT. Changes made by Wallace Whittle included:

12.8.1 The room function ‘HDU’ was removed from both of the Room Function Reference Sheets. It is not clear to the Inquiry Team why this reference was removed. It resulted in there being no reference to a high dependency unit or to critical care in the ‘Room Function’ section of the ‘Room Function Reference Sheet’.

12.8.2 The room function ‘operating theatre recovery’ was also removed from both RFRS.

12.8.3 The environmental data provided for Recovery Bay/Recovery Room was changed in the RFRS in the ‘All Rooms’ Tab to reflect the air change rates and relative pressure contained in SHTM 03-01, although the figures for temperature and minimum filtration remained the same as the previous version.

12.8.4 The Room Function Reference Sheet contained in the ‘All Rooms’ tab also introduced changes to the specifications for Bedroom and Multi-bed Ward room functions, including changes to the temperature, ventilation type (natural and central supply air), extract (via en-suite) and relative pressure (positive to en-suite).

12.8.5 A column was added for ‘ADB code’. An ‘ADB code’ was included for some rooms. However, not all rooms contained an ‘ADB Code’.

12.9 The ‘All Rooms’ tab contained the following information (with some changes such as the deletion of ‘HDU’ highlighted). Specifications recommended by SHTM 03-01 and SHPN 04 supplement 1 are in bold where they differ from those in the RFRS.

Tab: All Rooms

Room Function	ADB Code	Ventilation					Notes
		Type	Supply Ac/hr	Extract ac/hr	Relative Pressure	Min Filtration	
Bedroom		Natural and Central Supply Air (previously 'central supply air'. SHTM 03-01 recommends central supply air)	4 **(6)**	Via en-suite (previously '0')	Positive to en-suite (previously 'positive', SHTM 03-01 recommends **balanced or negative)**	G4	See Guidance Notes
Changing Facilities		Central Supply and Extract	5	4	Positive	G4	
HDU **(removed)**		Central Supply Air	10	0	Positive	F7	See Guidance Notes
Multi-bed Wards[13]		Natural and Central Supply Air (previously 'central supply air' SHTM 03-01 recommends central supply air)	4 **(6)**	Via en-suite (previously '0')	Positive to en-suite (Previously 'positive' SHTM 03-01 recommends **balanced or negative** for single bedrooms)	G4	See Guidance Notes
Isolation lobby		Central Supply	69	0	Positive	F7	See Guidance Notes

[13] SHTM 03-01 does not specify requirements for 4 bed rooms, however ADB room data sheets c.2011 show multi-bed wards to have same requirements as Single Room

Room Function	ADB Code	Ventilation					Notes
		Type	Supply Ac/hr	Extract ac/hr	Relative Pressure	Min Filtration	
Isolation bedroom		Supply via lobby	10	0	Positive (SHPN 04 suppl 1 states pressure differential to corridor should be **nominally 0**)	F7	See Guidance Notes
Operating Theatre Recovery **(removed)**		In line with SHTM 03-01	In line with SHTM 03-01	In line with SHTM 03-01	Balanced	F7	See Guidance Notes
Recovery Bay/Recovery Room		Central Supply and extract	15	15	Balanced	G4 **(F7)**	See Guidance Notes

12.10 In the department sheets, contained in the 'All Rooms' tab, the column for Department Sub-Group was removed. A column was added for 'ADB code'. The error in relation to the isolation room lobby in Critical Care was corrected. The table below shows the remaining potential inconsistencies with SHTM 03-01 and also marks up the erroneous inclusion of 'en-suite' to rooms in Critical Care, since these were not required in this department.

Dept Name	Room Name	Room Function	ADB Code	Ventilation					Notes
				Type	Supply ac/hr	Extract ac/hr	Relative Pressure	Min Filtration	
B1 PICU and HDUs	Open Plan Bay (4 beds)	Multi-bed Wards **SHTM 03-01: Critical Care Areas. No corresponding room function on RFRS**	B1609-01 (also B1609-02)	Natural and Central Supply Air **(Supply Air)**	4 **(10)**	Via en-suite **(no en-suite)**	Positive to en-suite **(no en-suite)**	G4 **F7**	See Guidance Notes
	Single Bed Cubicle	Bedroom **SHTM 03-01: Critical Care Areas. No corresponding room function on RFRS**	B1401	Natural and Central Supply Air **(Supply Air)**	4 **(10)**	Via en-suite **(no en-suite)**	Positive to en-suite **(no en-suite)**	G4 **F7**	See Guidance Notes
	Single cot cubicle	Bedroom **SHTM 03-01: Critical Care Areas. No corresponding room function on RFRS**	B1421	Natural and Central Supply Air **(Supply Air)**	4 **(10)**	Via en-suite **(no en-suite)**	Positive to en-suite **(no en-suite)**	G4 **F7**	See Guidance Notes

Dept Name	Room Name	Room Function	ADB Code	Ventilation					Notes
				Type	Supply ac/hr	Extract ac/hr	Relative Pressure	Min Filtration	
	Open Plan Bay (3 Cots)	Multi-bed Wards **SHTM 03-01: Critical Care Areas. No corresponding room function on RFRS**	B1407-01	Natural and Central Supply Air **(Supply Air)**	4 **(10)**	Via en-suite **(no en-suite)**	Positive to en-suite **(no en-suite)**	G4 **F7**	See Guidance Notes
C1.1 Medical Inpatients	Single Bedroom	Bedroom	B0305-01	Natural and Central Supply Air	4 **(6)**	Via en-suite	Positive to en-suite **balanced or negative**	G4	See Guidance Notes
	4 Bed Room	Multi-bed Wards[14]	B0405	Natural and Central Supply Air	4 **(6)**	Via en-suite	Positive to en-suite **balanced or negative**	G4	See Guidance Notes
C1.4 Haematology/ Oncology Inpatients and Daycases	Single Bedroom	Bedroom **SHTM 03-01: Neutropenic Patient ward. No corresponding room function on RFRS**	B0305-01	Natural and Central Supply Air **Supply Air**	4 **(10)**	0	Positive to en-suite	G4 **(H12)**	See Guidance Notes

[14] SHTM 03-01 does not specify requirements for 4 bed rooms, however ADB room data sheets c.2011 show same requirements as Single room

Dept Name	Room Name	Room Function	ADB Code	Ventilation					Notes
				Type	Supply ac/hr	Extract ac/hr	Relative Pressure	Min Filtration	
	Multi Bed Room: day care, 4 beds & 2 chairs	Multi-bed Wards **SHTM 03-01: Neutropenic Patient ward. No corresponding room function on RFRS**	B0405-01	Natural and Central Supply Air **Supply Air**	4 **(10)**	0	Positive to en-suite	G4 **(H12)**	See Guidance Notes
P1 Combined theatres	Post Anaesth-etic Recovery	Recovery Bay/Recovery Room		Central Supply and Extract	15	15	Balanced (this differs from the RFRS)	G4 **F7**	See Guidance Notes

12.11 The notes column still contained the instruction ‘see Guidance Notes’. The guidance notes contain requirements that differ from the figures provided in the department sheets. Specifically, Guidance Note 15 states:

> **“HDU bed areas** - Design Criteria - HBN 57 gives specific guidance as well as SHTM 03-01 - esp Appendix 1 for air change rates – 10 ac/hr Supply, 18°C to 25°C control range. (Capability shall be provided but not at the summer and winter external ambient design extremes against the internal maximum and minimum range conditions).
>
> The department should be air conditioned and controlled on a zonal basis.
>
> Central AHU plant requires humidification to achieve RH range during winter (HBN 57 Clause 4.60).
>
> **Post theatre recovery areas** - Design Criteria - SHTM 03-01 - esp Appendix 1 for air change rates – 15 ac/hr S&E , 18°C to 25°C control range.(Capability shall be provided but not at the summer and winter external ambient design extremes against the maximum and minimum range conditions).
>
> **Critical Care areas** - Design Criteria - SHTM 03-01 - esp Appendix 1 for air change rates – 10 ac/hr Supply , 18°C to 25°C control range.(Capability shall be provided but not at the summer and winter external ambient design extremes against the maximum and minimum range conditions). NHSL may require specific rooms to have a control range up to 28°C
>
> Central Air Handling Plant requires humidification to achieve RH range during winter (HBN 57 Clause 4.60).

12.12 As in the previous ‘reference design’ version of the environmental matrix, the air change rates and minimum filtration for the Critical Care areas described

in the department sheets are potentially inconsistent with SHTM 03-01. The Wallace Whittle version contains further detail relating to extract via en-suite and use of natural ventilation, which the Inquiry Team understands may not be suitable for rooms in Critical Care/HDU.

12.13 This version of the EM retained the ventilation figures for non-Critical Care single and multi-bed rooms which were potentially inconsistent with the air change rates and pressure regime outlined in SHTM 03-01, although natural ventilation is referred to in the column for ventilation type, and ‘extract via en-suite ’ is included.

12.14 The air change rates for post-anaesthetic recovery were now consistent with those recommended in SHTM 03-01, but the minimum filtration figure was inconsistent. The pressure regime was consistent with SHTM 03-01 but differed from what was outlined in the room function reference sheet.

12.15 On 14 October 2014, MML sent Multiplex a copy of NHSL's technical comments on the draft environmental matrix. The comments noted that the air change rates and pressure regime for bedrooms provided in the environmental matrix differed from SHTM 03-01 and that ‘Recovery stated as 4 ac/hr, SHTM says supply and extract 15 ac/hr’.

12.16 Although the comments note an error with figures for Recovery Room, these had in fact already been changed to 15 ac/hr in the ‘All Rooms’ tab but had not been changed in the ‘room function reference sheet’ tab.

12.17 No issues were raised by NHSL in relation to the values set out in the EM for critical care areas.

12.18 On 28 October 2014, Multiplex forwarded Wallace Whittle's response to the initial technical comments to MML. An extract of the relevant points are copied below (Wallace Whittle's response being the right-hand column in the table).

The Board has the following initial technical comments on the draft 1 of the Environmental Matrix	**IHSL Update 27 October 2014**
1. The submitted Environmental Matrix does not reflect the current Schedule of Accommodation, e.g. theatres and DCN acute care changes are not included. IHSL to provide up to date Environmental Matrix.	Theatre requirements are contained within the guidance notes section. The document will be updated to include these rooms as per item 5 below.
2. Issues within the guidance notes relating to:	
a. Environmental Matrix still dated as version 13 issued 19th September 2012	Date has been removed.
b. Humidification, the requirement is for the space for future installation,	Guidance notes amended accordingly.
c. HK Design reference to be removed	Reference removed.
3. The detail contained in the Clinical Output Specification requires theatre temperatures to be able to be raised to 31°C for certain operations. IHSL to reflect this in the Environmental Matrix.	Guidance notes amended accordingly.
6. SHTM 03-01 clause 2.11 states;	
“Internal temperatures in patient areas should not exceed 28°C db for more than 50 hrs per year”, however the Board added an additional BCR clause regarding the 25°C as clarified below:	Rooms at 25°C are identified within the matrix.
“Measures shall be assessed, modelled and implemented to demonstrate that the internal air temperature of any room or area does not exceed the maximum acceptable level of 25°C for more than 50 hours per annum”.	This is not agreed for all rooms. Refer to Environmental Matrix for individual room temperatures.
Further review and development of the Environmental Matrix is required to clarify the following:	The BCR’s allow for several rooms to go to 28 deg C and we have not received a change order to reduce the temperature in these rooms.

The Board has the following initial technical comments on the draft 1 of the Environmental Matrix	**IHSL Update 27 October 2014**
a. There are some rooms at 28°C which are provided with comfort cooling.	We understand that Internal temperatures in these rooms should not exceed 28°C db for more than 50 hrs per year
b. There are areas/rooms in the Environmental Matrix that contradict the above BCR clause, hence once IHSL produce an updated Environmental Matrix, further discussion is required with the Board to confirm which rooms or areas are not going to meet the Clause.	As indicated during the workshops we do not consider this as a contradiction. The BCR has two clauses one for specific rooms based on the 25°C and another for rooms on the 28°C criteria.
7. Bedrooms 4 ac/hr, SHTM says 6 ac/hr Bedrooms have no extract Bedroom en-suites 10 ac/hr, SHTM says 3 ac/hr Bedrooms stated as positive pressure, SHTM says 0 or –ve pressure The supply air to a bedroom has to be balanced with extract e.g.Bedroom area 19m2 and 2.4m high = volume 45.6m3 x 6ac/hr = 273.7m3 / hr En-suite area 5m2 and 2.4m high = 12.0m3 x 3ac/hr = 36m3 / hr To achieve balanced pressure within bedroom extract required = 276.3 – 36 = 237.6 m3/hr	The scheme is based on the Reference design throughout which is essentially mixed mode with openable windows and 2/3rds mechanical supply air to all bedrooms. This gives physiological benefits with access to fresh air control by user and obvious Energy Benefits. We have amended the environmental schedule to show the room being balanced which is provided by opening the window.
8. Recovery stated as 4 ac/hr, SHTM says supply and extract 15 ac/hr	15 ac/hr utilised with the current design, matrix amended accordingly

12.19 These comments show that NHSL had highlighted to IHSL potential inconsistencies between the EM and:

- the current Schedule of Accommodation (a document listing all the rooms in the hospital, along with room sizes);
- the Clinical Output Specifications (which describes the clinical function and requirements for departments);
- the Board's Construction Requirements; and
- SHTM 03-01.

12.20 The comments also indicate a difference of opinion between NHSL and IHSL on the correct interpretation of NHSL's published requirements.

12.21 On 31 October 2014, Multiplex issued an updated version of the EM to MML. The guidance notes section stated that:

> "1. This workbook is prepared for the Financial Close Stage as an easier reference tool to replace ADB RDS M&E Sheets for the Environmental Criteria Elements as described on these sheets"

12.22 The Inquiry Team notes that by financial close, room data sheets should have been prepared for all spaces in the hospital. It is not therefore clear why the EM would still be required at financial close. It is not clear when a decision was taken to dispense with the requirement for all room data sheets to be completed by financial close or why this decision was taken.

12.23 A meeting with the subject 'Environmental Matrix NHSL Comments Feedback' was convened on 11 November 2014. The meeting was attended by representatives from Multiplex, Wallace Whittle, NHSL and MML. Notes of the meeting were prepared by MML and issued by e-mail on 11 November 2014. Bullet 4 related to the pressure regime for single bedrooms and stated, "Detailed proposal awaited on bedroom ventilation to achieve balanced/negative pressure relative to corridor".

12.24 NHSL's Infection Control team and technical adviser MML expressed concern that IHSL's proposal for single bedroom ventilation was not compliant with

SHTM 03-01. Specifically, there was concern around the pressure regime, and the reliance on opening windows to maintain the required balanced pressure regime.

12.25 On 12 November 2014, Colin Macrae (MML) asked his colleague William Stevenson (MML) for comments on a summary of IHSL's ventilation strategy for single rooms. The proposal involved the opening of windows. The document attached to the email states:

"Single bedroom ventilation

Project Co's current ventilation strategy for the above room is as follows:

Supply air to bedroom at 4 ac/h and 17m2 x 2.4m high = 40.8 m3 x 4 ac/h = 163.2m3/h

Extract air from en-suite at 10 ac/h and 4.5m2 x 2.4m high = 10.8 m3 x 10ac/h = 108m3/h

This leaves an excess of 55 m3/h supply air to be discharged by other means to achieve balanced ventilation within the bedroom. Project Co have stated that this is satisfied by opening the window or the trickle vent on the window if the window is closed.

Extract from the corridor will reduce the resultant corridor pressure.

SHTM 03-01 Table A1

Room	Ventilation	Air change rate	Pressure	Comment
Single bedroom	supply/extract/natural	6	balanced or negative	
En-suite	extract	3	negative	

Mott MacDonald concern is that the room will be at a slight positive pressure relative to the corridor which would allow infection such as MRSA or Norovirus to spread."

12.26 William Stevenson responded on 12 November 2014 stating:

"I would tend to agree with your comments.

There is an excess of positive pressure air in the bedrooms.

Project Co are stating that the excess air will pass through the ventilator.

That would appear to imply that the ventilator would be required to be open all year round which would have an impact on energy targets – heat would be lost through the ventilators rather than recovered through the heat recovery systems?

There are still issues over them achieving the required 6 air changes in the room as per SHTM 03-01."

12.27 On 13 November 2014 this email was forwarded from Graeme Greer (MML) to Brian Currie (NHSL). Mr Greer stated:

"Further to the Environmental Matrix meeting on Monday, please refer to the email below and attached that summarised the issue with the single bedroom ventilation.

As discussed at the Environmental Matrix meeting we added the following comment on the Environmental Matrix,

'Detailed proposal awaited on bedroom ventilation to achieve balanced/negative pressure relative to corridor.'

However this may come down to an dispute over the SHTM requirement/ Infection Control requirements.

Might be worth raising this again at the RDD meeting?"

12.28 'RDD meeting' refers to meetings held to discuss Reviewable Design Data, which would be included in the Project Agreement Schedule Part 6 (Construction Matters) Section 5 (Reviewable Design Data), referred to as the 'RDD Schedule'. Reviewable Design Data refers to information, such as design deliverables and Project Co proposals, that had not yet been approved by the Board of NHSL and were subject to amendment in accordance with Board comments.

12.29 On 13 November 2014, Graeme Greer also emailed Brian Currie regarding the revised payment mechanism and GSU[15] table. Attached to the email was a report regarding a review of IHSL's Schedule of Accommodation (SoA) and Environmental Matrix, which MML had undertaken with a view to updating the Gross Service Unit Table (GSU) for inclusion in Schedule Part 14 (Payment Mechanism). The purpose was to mitigate the risk of using inaccurate data in the Payment Mechanism. MML found that IHSL's SoA revealed differences between the reference design and IHSL's design, and also did not reflect the current 1:200 drawings for the hospital. For example, the SoA referred to rooms that had been removed since the reference design, and did not include some rooms that had since been added to the design. Thus, the SoA was out of date. The problems highlighted with the EM, specifically in relation to IHSL's SoA and Payment Mechanism, included:

- The EM issued is closer to the Hulley and Kirkwood Reference Design SoA, hence is out of date
- Environmental Parameters can therefore not be set for rooms that do not exist

[15] GSU - Gross service units. Relates to energy consumption.

MML stated that the “EM therefore needs to be updated once the SOA has been updated.”

12.30 Following an RDD Meeting on 13 November 2014, the requirement to update the Schedule of Accommodation “to reflect all of the individual elements of the proposed Facilities in accordance with Good Industry Practice” was included in the ‘RDD Schedule’.

12.31 The Inquiry Team understands that on 19 November 2014, a Healthcare Associated Infection (HAI) – System for Controlling Risk in the Built Environment (SCRIBE) (HAI-Scribe) meeting was held at which it was recorded that the ventilation system design was not fit for purpose given the potential for infection spread via ventilation systems. The reason stated was that some concern has been raised in relation to a potential issue with ventilation with regard to negative/balance pressure in single bed rooms. Drawings and further information were require to fully understand if there was a risk/issue.

12.32 In an email of the same date, Liane Edwards-Scott emailed Ken Hall stating that: “Motts have just informed the HAI scribe that the vent system doesn't comply with infection control because it relies on the windows being openable- can you shed some light or offer opinion?”. Ken Hall forwarded this email to Stewart McKechnie, stating:

“Can you treat as priority the bedroom sketches for the vent before the door closes and we have no alternative but to comply with infection control requirements.

Realistically I think we need:

1.0 Interpretation of SHTM for bedrooms
2.0 Air flow movement under a few scenarios, natural vent etc
3.0 And how this impacts on the adjacent corridor ventilation

We will need to chat it through internally then table with infection control."

12.33 Mr McKechnie, of TUV SUD Ltd, replied stating "Told you wouldn't wait till RDDDDDDDDDD !!!" [sic].

12.34 TUV Sud/Wallace Whittle produced a draft report for air movement to single bedrooms dated 27 November 2014. A second draft was produced on 12 January 2015, titled 'RHSC-DCN Edinburgh Air Movement Report For Single Bedrooms (Draft)'. Under the section headed, 'Interpretation of SHTM 03 [sic] Ventilation for Healthcare Premises', the report states:

"A single room within Appendix 1 : Table A1 : Recommended air-change rates is given under the ventilation column as supply/extract/natural, with 6 ac/hr and room pressure as zero or negative. The single room WC from the table is 3 ac/hr and room pressure is negative.

Current bedroom ventilation design is supply into the room at 4 ac/hr with opening windows and trickle vents to provide natural ventilation, this gives a balanced room pressure as long as the window is open.

The single bedroom WC extract has been enhanced to 10 ac/hr and the room pressure is negative."

12.35 The Conclusion section states:

"…When the windows and trickle vents are utilised for natural ventilation the bedroom pressure is balanced and the corridor becomes negative.

If some of the windows and trickle vents are closed, these bedrooms will become positive and the bedrooms with open windows again will be balanced, where the corridor is negative.

Should all the bedroom windows and trickle vents be closed, the bedroom pressure is positive and the corridor shall be balanced as the corridor

extract rate will match the supply air coming from the bedrooms via their doors.

The window trickle vents should be left open when the rooms are occupied, this will ensure that the bedroom pressure is balanced.

By utilising the proposed mixed mode ventilation proposal for the bedrooms, ie. opening windows and trickle vents with the supply air reduced from 6Ac/Hr to 4Ac/Hr direct into the bedroom, this will provide the most energy efficient solution for the space.

We believe that we have complied with the reference design concept as detailed within the original Environmental Matrix."

12.36 On 13 January 2015, an 'MEP' (mechanical, electrical and plumbing) workshop meeting was held at which the issue of pressure regimes was discussed. This was originally planned as a HAI-Scribe Stage 3 review which was cancelled due to lack of attendance of key people. However, ventilation was discussed by those who attended.

12.37 According to an 'RFI Summary' issued on behalf of NHSL, a query was raised on 13 January 2015 regarding HAI Scribe stage 3 Construction:

We had scheduled a meeting today to complete HAI Scribe Stage 3 but unfortunately we could not proceed with the meeting as key individuals were not present. We did however manage to discuss the ventilation query and we will now review the information we were given at the meeting, which Ken is going to send electronically. As you will be aware this stage of HAI Scribe has to be completed prior to any construction starting on site. HFS have recently reviewed and changed HAI Scribe documentation and it is the new documentation that we are using.

When we completed Stage 2 at the workshop on 19th November we agreed that NHSL and their TAs would review the Stage 3 template and complete it in draft format which we would then review with IHSL at today's workshop. In order to progress this those of us who were at today's workshop agreed that in the first instance we would send you the completed draft and request that you review this and amend the document as appropriate. It is important that the [sic] as well as checking the yes/no/n/a responses that additional information is provided in the comments boxes to justify the response.

Given the need to have this completed prior to construction commencing and the need for us to review the completed documentation internally before we can sign off we do need to turn this around quickly. It may also be that we will require to meet to review the documentation but will advice [sic] of this once we have the completed documentation back from you."

12.38 On 13 January 2015, Janette Richards, NHSL's lead HAI-Scribe Infection Prevention and Control Nurse, sent an email to Ian Stewart (Consultant within HFS' Engineering and Environment department). David Stillie was copied into this email. In her email, Ms Richards provides detail on isolation rooms and then addresses the issue around pressure in single bed rooms:

"Single bed room accommodation will have positive pressure ventilation with negative in the en-suite facility but there will be no option to make the room negative pressure if infected patient in the room-however my understanding, from speaking with Mr Stuart Mckecnie who used to work with you I believe, is if the window/window grills are open the room then becomes negative pressure. I am concerned that we will not have a local option to have neg/pos pressure ventilation option. Most of the facility will be single room accommodation and if the rooms all have positive pressure then nothing should go into the rooms via the doors so immunocompromised patients should still be protected if they have to go into isolation other than the isolation rooms.

12.39 Mr Stewart responded on 14 January 2015, stating:

> "The situation regarding what SHPN 04 Supplement 1 describes as an enhanced single bed room (ie with gowning lobby) is that
>
> The lobby will have positive mechanical ventilation (over 60 air changes)
> The en suite will have extract ventilation creating negative pressure
> The bed room is 'balanced' without any supply or extract directly to/from the room allowing cascading of air from the lobby to the room via a pressure stabiliser and from the room to the en suite via a fixed grille (probably part of the door assembly).
>
> For what it is worth, I wrote this SHPN!
>
> Its philosophy is much simpler than it used to be. The concept of optional positive/negative ventilation, controlled by staff, for the actual bed room is outmoded. Staff were invariably confused as to when they should provide which and this led to human error and unwanted or unintended air-flow patterns.
>
> The logic now adopted is that if a patient is infectious, the positive pressure in the lobby will stop any 'infected' air getting into the corridor affecting other patients who are not isolated. If a patient is susceptible to infection, the reverse will occur and the corridor air will not get into the bedroom.
>
> I don't think I know Mr McKechnie but I am surprised at reference to the use of openable windows. This could lead to ingress of unfiltered air or egress of infectious air that could find its way to a nearby openable window (whether or not in an isolation room) or to a nearby air intake. In short, have sealed windows as this will enable ait [sic] flow patterns to be controlled."

12.40 Ms Richards forwarded Mr Stewart's response to Janice Mackenzie and David Stillie. Mr Stillie forwarded it on to Colin Macrae. Ms Mackenzie forwarded it to Maureen Brown on 16 January 2015.

12.41 On 14 January 2015, Ms Mackenzie, Clinical Director, NHSL, emailed Fiona Halcrow, attaching the Report by TUV SUD/Wallace Whittle entitled "RHSC – DCN Edinburgh Air Movement Report For Single Bedrooms (Draft)" as well as drawings headed G1547(57) showing air flows and resultant pressure using an extract taken from level 2 bedroom ventilation. According to this report, bedrooms could achieve 6ach/hr and balanced pressure through opening windows. Ms Mackenzie stated:

> "FYI, we discussed this yesterday and what was meant to have been the HAI Scribe Stage 3 workshop but other than the M&E people who were there to talk about the ventilation query the correct people weren't there!!
>
> Anyway David is going to discuss with Colin and Janette with HFS. IHSL do appear to have followed the relevant SHTM, so we await outcome of these discussions."

12.42 On 19 January 2015, Multiplex issued the following Request for Information to MML:

> "As per meeting of Tuesday 13.01.15 and our request for clarity on negative/positive pressure regime within the bedrooms, we attach the sketches distributed at the meeting and seek confirmation/acceptance from the NHS review with infection control."

12.43 Ken Hall (Multiplex) asked again for confirmation in an email to Kamil K Kolodziejczyk on 21 January 2015, copying in Maureen Brown and Colin Macrae. In an email dated 23 January 2015 Mr Macrae stated that:

> "The definitive answer that Ken is looking for from Tuesday's meeting is as follows:

- The single room with en-suite ventilation design shall comply with the parameters set out in SHTM 03-01.

- The design solution should not rely in any way with the opening windows as these will be opened or closed by patient choice.

- The critical factor from SHTM 03-01 for infection control will be the resultant pressure within the room being balanced with or negative to the corridor."

12.44 Graeme Greer responded stating:

"Can we run this past the Board prior to issue to Ken?"

12.45 Maureen Brown sent the comments on to Janice Mackenzie and Janette Richards to review and confirm whether they were happy for it to be released to IHSL. Janice Mackenzie responded on 26 January 2015 stating:

"…based on what Colin is saying are we therefore saying we are happy with their proposal for the isolation rooms?

If this is the case then I think this seems fine, but would want Janette to confirm she is happy."

12.46 Janette Richards responded on 28 January 2015:

"I have forwarded the information re isolation room ventilation from HPS, if the ventilation is now being put in place as per these requirements that were sent to David Stillie then I am happy with that."

12.47 On 29 January 2015 Maureen Brown (MML) responded to Ken Hall (Multiplex) using the Aconex system, stating:

"Following your recent RFI, the Board respond as follows:

- The single room with en-suite ventilation design shall comply with the parameters set out in SHTM 03-01.

- The design solution should not rely in any way with the opening windows as these will be opened or closed by patient choice.

- The critical factor from SHTM 03-01 for infection control will be the resultant pressure within the room being balanced with or negative to the corridor.

- Isolation room ventilation shall comply with SHPN 04 Supplement 1.

12.48 According to a document entitled 'Design risks to the Board at Financial Close', the risks at 28 January 2015 included an item on ventilation. The issue is not described, but it is given a 'high' risk impact. The current mitigation measures were:

"The single room with en-suite ventilation design shall comply with the parameters set out in SHTM 03-01.

The design solution should not rely in any way with the opening windows as these will be opened or closed by patient choice.

The critical factor from SHTM 03-01 for infection control will be the resultant pressure within the room being balanced with or negative to the corridor.

Isolation room ventilation shall comply with SHPN 04 Supplement 1."

12.49 The Inquiry Team understands that the issues outlined above were not definitively resolved before NHSL entered into a contract with IHSL in February 2015. It is not clear to the Inquiry Team why NHSL were prepared to enter into the contract when such issues remained unresolved. This issue will require to be explored with witnesses at the hearing in April 2023.

12.50 In the review process described above, no one commented on the air change rates, or pressure regimes, specified for High Dependency Units/ Critical Care within the EM.

12.51 At Financial Close, the EM was included in the Project Agreement as one of 'Project Co's Proposals'. This iteration again contained two room function reference sheets. Extracts from the second, which contained the most changes, are shown below. Where the stated figures differ from those set out in SHTM 03-01, the Inquiry Team have added the figure from SHTM 03-01 in bold for ease of reference.

Room Function	**ADB Code**	**Ventilation**					**Notes**
		Type	Supply Ac/hr	Extract ac/hr	Relative Pressure	Min Filtration	
Bedroom		Natural and Central Supply Air **(Central supply air)**	4 **(6)**	Via en-suite **(Not specified)**	Balanced (previously 'positive to en-suite')	G4	See Guidance Notes
Multi-bed Wards		Natural and Central Supply Air **(Central supply air)**	4 **(6)**	Via en-suite	Positive to en-suite **(Balanced or negative)**	G4	See Guidance Notes

Room Function	ADB Code	Ventilation					Notes
		Type	Supply Ac/hr	Extract ac/hr	Relative Pressure	Min Filtration	
Recovery Bay/Recovery Room		Central Supply and extract	15	15	Balanced	G4 **(F7)**	See Guidance Notes

12.52 As before, there is no ‘room function’ for HDU or neutropenic patient ward.

12.53 The pressure regime for single bedrooms had been changed from ‘positive to en-suite ’ to ‘balanced’, in line with comments received in relation to the ventilation solution for single bedrooms. However, the pressure regime for multi-bed wards remained the same as previous versions.

12.54 The pressure regime for recovery bay/recovery room had been changed to ‘balanced’.

12.55 The table below shows remaining potential inconsistencies between the EM and SHTM 03-01. It also marks up the potentially erroneous inclusion of ‘en-suite’ to rooms in Critical Care, which, the Inquiry Team understands, were not required in this department.

Dept Name	Room Name	Room Function	ADB Code	Ventilation					Notes
				Type	Supply ac/hr	Extract ac/hr	Relative Pressure	Min Filtra-tion	
B1 PICU and HDUs	Open Plan Bay (4 beds)	Multi-bed Wards **SHTM 03-01: Critical Care Areas. No corresponding room function on RFRS**	B1609-01 (also B1609-02)	Natural and Central Supply Air **Supply Air**	4 **10**	Via en-suite **no en-suite**	Positive to en-suite **no en-suite**	G4 **F7**	See Guidance Notes
	Single Bed Cubicle	Bedroom **SHTM 03-01: Critical Care Areas. No corresponding room function on RFRS**	B1401	Natural and Central Supply Air **Supply Air**	4 **10**	Via en-suite **no en-suite**	Balanced **positive**	G4 **F7**	See Guidance Notes
	Single cot cubicle	Bedroom **SHTM 03-01: Critical Care Areas. No corresponding room function on RFRS**	B1421	Natural and Central Supply Air **Supply Air**	4 **10**	Via en-suite **no en-suite**	Balanced **positive**	G4 **F7**	See Guidance Notes
	Open Plan Bay (3 Cots)	Multi-bed Wards **SHTM 03-01: Critical Care Areas. No**	B1407-01	Natural and Central Supply Air	4 **10**	Via en-suite **no en-suite**	Positive to en-suite **no en-suite**	G4 **F7**	See Guidance Notes

Dept Name	Room Name	Room Function	ADB Code	Ventilation					Notes
				Type	Supply ac/hr	Extract ac/hr	Relative Pressure	Min Filtra-tion	
		corresponding room function on RFRS		**Supply Air**					
C1.1 Medical Inpatients	Single Bedroom	Bedroom	B0305-01	Natural and Central Supply Air	4 **6**	Via en-suite	Balanced	G4	See Guidance Notes
	4 Bed Room	Multi-bed Wards[16]	B0405	Natural and Central Supply Air	4 **6**	Via en-suite	Positive to en-suite **balanced or negative**	G4	See Guidance Notes
C1.4 Haematology/Oncology Inpatients and Daycases	Single Bedroom	Bedroom **SHTM 03-01: Neutropenic Patient ward. No corresponding room function on RFRS**	B0305-01	Natural and Central Supply Air **Supply Air**	4 **10**	0	Balanced **Positive**	G4 **H12**	See Guidance Notes

[16] SHTM 03-01 does not specify requirements for 4 bed rooms, however ADB room data sheets c.2011 show same requirements as Single room

Dept Name	Room Name	Room Function	ADB Code	Ventilation					Notes
				Type	Supply ac/hr	Extract ac/hr	Relative Pressure	Min Filtra-tion	
	Multi Bed Room: day care, 4 beds & 2 chairs	Multi-bed Wards **SHTM 03-01: Neutropenic Patient ward. No corresponding room function on RFRS**	B0405-01	Natural and Central Supply Air **Supply Air**	4 **10**	0	Positive to en-suite ***balanced***	G4 **H12**	See Guidance Notes
P1 Combined theatres	Post Anaesthetic Recovery	Recovery Bay/Recovery Room		Central Supply and Extract	15	15	Balanced	G4 **F7**	See Guidance Notes

12.56 The Department sheets included changes to the pressure regime in single bedrooms, but not in multi-bed wards.

12.57 For Critical Care/HDU areas, the ventilation type, air changes and minimum filtration figures are all potentially inconsistent with SHTM 03-01. En-suites are mentioned but Critical Care/HDU areas do not require en-suites. The pressure regime for single bed cubicles, while corrected for single bedrooms, was now inconsistent with that recommended for Critical Care areas.

12.58 The ventilation for post-anaesthetic recovery was consistent with SHTM 03-01 with the exception of minimum filtration.

12.59 The Inquiry Team understands that the draft room data sheets dated 18 September 2014 were included in the Project Agreement as Schedule Part 6 (Construction Matters) section 6 (Room Data Sheets) and that these had not yet been approved by the Board of NHSL as they were included in Part 3 of the RDD Schedule which included Reviewable Design Data 'not provided to the Board nor approved by the Board at Financial Close'. The draft RDS appears to replicate the environmental data contained in the EM, which contains potential discrepancies when compared to SHTM 03-01.

12.60 It is not clear to the Inquiry Team how these discrepancies could have arisen if room data sheets, showing room environmental data, were produced using ADB. The procedure for the creation of IHSL's room data sheets will require to be explored with witnesses at the hearing diet in April 2023, In particular, whether room data sheets were produced to comply with the values set out in the EM rather than published guidance and, if so, why this procedure was adopted and why it was deemed acceptable by NHSL.

12.61 The Inquiry Team has seen no information or documentation that suggests the potential divergence from published guidance (namely SHTM 03-01) in the room data sheets for critical care was spotted by NHSL or its advisers when tenders were assessed or in the period to Financial Close.

12.62 The Project Agreement provided a mechanism, known as a derogation register, by which IHSL could highlight to NHSL any proposed derogations from the Board's Construction Requirements (BCRs) so that they could be agreed by NHSL.

12.63 On 5 September 2014, a derogation was requested from BCR Clause 8 Mechanical and Electrical Engineering Requirements which states "Project Co shall provide the Works to comply with the Environmental Matrix". The reason for this derogation was that 'anomalies' had been found within the environmental matrix. No further detail was provided with respect to these anomalies in the initial derogation request. Following further dialogue regarding the environmental matrix, IHSL submitted a reworded derogation request on 13 November 2014 which NHSL approved on 14 November 2014. Project Co's proposal stated:

> "Anomalies within the environmental matrix have been reviewed and proposals incorporated within the room data sheets (refer to schedule for proposed variations).This shall be further developed in conjunction with the board on the basis of the schedule of comments contained in Section 5 (RDD) Part IV."

12.64 As at Financial Close, the derogation register did not identify any proposed derogation by IHSL from SHTM 03-01 in relation to air change rates, pressure regimes and filtration within Critical Care.

12.65 IHSL's EM was not approved by the Board of NHSL at financial close. Neither were IHSL's room data sheets, which were associated with the EM as per paragraph 2.5.2 of the ITPD, which referred to the EM as one of a suite of documents providing room information that could be used in the production of room data sheets.

12.66 The EM, along with other design data, was included in the schedule of Reviewable Design Data, contained within Schedule Part 6 to the Project Agreement, section 5.

12.67 Schedule Part 6 (Construction Matters) Section 3 (Board's Construction Requirements) of the Project Agreement provided that Project Co shall submit Reviewable Design Data for review by the Board of NHSL in accordance with Schedule Part 8 (Review Procedure) and Clause 12.6 (Board Design Approval) of the Project Agreement.

12.68 These clauses provided that Project Co was not to commence or permit the commencement of construction of the part of the facilities to which the Reviewable Design Data related until that Reviewable Design Data had been submitted to the Board of NHSL and either:

- It had been approved; or
- Project Co disputed that the comments/objections made by the Board in relation to that Reviewable Design Data were on grounds permitted by the Project Agreement, in which case Project Co could proceed with further design or construction at its own risk pending the outcome of any reference to the Dispute Resolution procedure.

12.69 Schedule Part 8 Paragraph 4 outlines the meaning of the different "levels" allocated to Reviewable Design Data reviewed by the Board. These are set out in the table below:

Level	Meaning
A	No comment. The submitted item of Reviewable Design Data shall be complied with or implemented by Project Co.
B	Proceed subject to amendment as noted. Project Co shall proceed to construct (or proceed to the next level of design) of the submitted item of Reviewable Design Data but take into account any amendments required by the Board in their comments.

Level	Meaning
C	Subject to amendment as noted. Project Co shall not act upon the submitted item of Reviewable Design Data, but amend the submitted item in accordance with the Board's comments and re-submit the same for review.
D	Rejected. Project Co shall not act upon the submitted item of Reviewable Design Data, but amend the submitted item and re-submit the same for review.

12.70 By Financial Close IHSL's EM had received only a Level C or D status from the Board of NHSL, and was included in Part 4 of the schedule of Reviewable Design Data. Part 4 was titled 'Non-Approved Project Co's Proposals Design Data comments' and it outlined the amendments that Project Co needed to make before resubmitting the item to the Board for review.

12.71 Part 4 of the schedule of Reviewable Design Data: 'Non-Approved Project Co's Proposals Design Data comments' contained the following in respect of the EM:

"Project Co shall update the Environmental Matrix to reflect the following Board comments

- The Environmental Matrix shall by [sic] updated by Project Co to reflect all the rooms and room types in the proposed Facility, this should be based on an updated Schedule of Accommodation that has been commented on separately by the Board. This also needs to reflect the names and room numbers in the GSU table.
- Include the requirements contained in the Clinical Output Specification including but not limited to the requirement that theatre temperatures are to be able to be raised to 31°C for certain operations
- Measures shall be assessed, modelled and implemented to demonstrate that the internal air temperature of the following room types to reduce the temperature control from 28°C to 25°C;
    - Treatment Rooms;
    - Consulting Rooms;

    - Laboratory;
    - Physiotherapy Studio;
    - Recovery.
- These room shall not exceed the maximum acceptable level of 25°C for more than 50 hours per annum
- Detailed proposal awaited on bedroom ventilation to achieve balanced/negative pressure relative to corridor.
- Colour rendering all stated as 80 where certain areas should be 90.

12.72 Room Data Sheets were mentioned in Part 3 of the schedule: 'Reviewable Design Data' - Reviewable Design Data not provided to the Board at Financial Close.

12.73 By Financial Close, the EM was not obsolete. It was included as part of the contract between NHSL and IHSL. The EM had undergone various stages of development and review. Further development of the EM and room data sheets was still required, and would take place through the Reviewable Design Data process.

12.74 Concerns had been raised about the pressure regime for single bedrooms, and mention made of the fact that SHTM 03-01 recommended 6 ac/hr and not 4 ac/hr as contained in the EM. However, there were still a number of other potential inconsistencies between the EM and SHTM 03-01 that had not been raised as an issue.

12.75 Single bed cubicles and open plan bays in Critical Care/HDU potentially did not meet the specifications for Critical Care Areas as outlined in SHTM 03-01. Specifically, the ventilation type, air change rates and minimum filtration were potentially inconsistent with SHTM 03-01, and the pressure regime for single bed cubicles in Critical care was potentially inconsistent with SHTM 03-01.

12.76 Single and multi-bed rooms in haematology/oncology department did not meet the specifications for neutropenic patient ward as outlined in SHTM 03-

01. Specifically, the ventilation type, air change rates, pressure regime and minimum filtration were all inconsistent with SHTM 03-01.

13. Provisional Conclusions

13.1 As outlined at the start, this paper seeks to set out the Inquiry Team's current understanding of the EM adopted for the Project. It is provisional in nature. There are issues highlighted in the Paper where the Inquiry Team's knowledge is incomplete. Such issues will need to be covered with witnesses at an oral hearing. The paper does not constitute any findings of the Chair of the Inquiry. It is open to any CP to seek to correct and/or contradict the contents of the paper. However, unless that is done, in addition to such other findings in fact that Counsel considers appropriate, the Chair is likely to be invited by Counsel to the Inquiry to make the following findings in fact at the conclusion of the hearing diet scheduled for April 2023:

13.1.1 CEL 19 provides guidance on the approach NHS Scotland bodies should adopt for the briefing and design stages of any new hospital.

13.1.2 CEL 19 mandates that all NHS Scotland Bodies use the English Department of Health's Activity Database (ADB) as a tool for briefing, design and commissioning. Where ADB is deemed inappropriate for a particular project, and an alternative tool is used, the NHS Scotland Body is required to demonstrate that the alternative is of equal quality and value to ADB in its application.

13.1.3 Room data sheets produced using ADB automatically comply with guidance and legislation applicable in England.

13.1.4 An NHS Scotland body utilising ADB would need to ensure compliance with Scottish guidance, including SHTMs.

13.1.5 NHSL did not use ADB as a tool for the briefing stage of the RHCYP/DCN project.

13.1.6 An ‘environmental matrix’ was utilised as part of the procedure for NHSL to brief prospective tenderers on its technical requirements for the ventilation system.

13.1.7 The ‘environmental matrix’ was a spreadsheet that set out environmental information, including air changes per hour and pressure regimes for various rooms in the proposed new hospital, in one spreadsheet.

13.1.8 The Inquiry has seen no documentation demonstrating: (i) why NHSL determined to deviate from using ADB as a briefing tool; and (ii) why it considered that the alternative approach that it adopted was of equal quality and value to ADB.

13.1.9 The ITPD informed prospective tenderers that the preferred bidder required to prepare room data sheets for every room in the hospital by financial close. Therefore, the environmental matrix should have been obsolete by Financial Close as a briefing and design tool.

13.1.10 H&K produced the original environmental matrix for the project on 9 September 2010.

13.1.11 H&K developed the environmental matrix in the period to 19 September 2012. This version of the environmental matrix was issued to prospective tenderers with the ITPD.

13.1.12 The environmental matrix stated that the document was an easier reference tool to replace ‘ADB RDS M&E’ Sheets.

13.1.13 The environmental matrix was not produced using ADB.

13.1.14 The environmental matrix was created by figures being manually input into a spreadsheet.

13.1.15 H&K stated to MML on 16 March 2012 that the Reference Design –which included the environmental matrix– complied with published guidance (including SHTM 03-01).

13.1.16 This assurance was obtained approximately six months before the environmental matrix was finalised by H&K.

13.1.17 The 16 March 2012 confirmation was the only occasion, prior to the conclusion of the contract with the preferred bidder, where 'environmental information' set out in the Reference Design concerning the proposed ventilation system for the hospital – including air changes per hour and pressure regimes - was formally reviewed and signed-off for compliance with published healthcare guidance (including SHTM 03-01).

13.1.18 The environmental matrix provided with the ITPD contained environmental information that was inconsistent with the guidance set out in SHTM 03-01. In particular, values inserted in the environmental matrix for certain critical care areas did not comply with the guidance in SHTM 03-01.

13.1.19 The environmental matrix contained a 'notes' section. The notes contained information that contradicted certain values in the environmental matrix itself in relation to critical care areas.

13.1.20 The environmental matrix had a 'Room Function Reference Sheet'.

13.1.21 The version of the environmental matrix issued with the ITPD had a 'room function' of 'HDU' (High Dependency Unit).

13.1.22 No room in the environmental matrix was designated as having the 'Room Function' of 'HDU'. This included rooms in critical care areas.

13.1.23 Multi-bed rooms in critical care areas of the hospital were assigned the 'room function' of 'multi-bed ward'. The values inserted in the

environmental matrix for these rooms, including air changes per hour, were inconsistent with those set out in SHTM 03-01 for critical care areas of a hospital.

13.1.24 ITPD Volume 1, Section 2.5.3 stated that tenderers were required to use the environmental matrix, and other 'Room Information' documents, to form the basis of Room Data Sheet production.

13.1.25 There was a lack of clarity in the procurement documents in relation to: (i) the purpose of the environmental matrix; and (ii) whether compliance with the environmental matrix was mandatory.

13.1.26 IHSL did not seek to change any of the values set out in the environmental matrix either at the competitive dialogue stage or when it submitted its final tender.

13.1.27 One tenderer, Bidder C, did change values in the environmental matrix.

13.1.28 Both IHSL and Bidder C were assessed by NHSL as having submitted compliant tenders. This assessment was made notwithstanding the fact that IHSL and Bidder C were offering to provide different technical requirements in terms of the environmental matrices submitted.

13.1.29 IHSL stated in its tender that its proposal for the ventilation system would comply with SHTM03-01.

13.1.30 Given the disconnect between the values in the environmental matrix (issued with the ITPD) and SHTM03-01, it is not clear why IHSL's tender was deemed by NHSL to comply with the published requirements.

13.1.31 IHSL developed the environmental matrix in the period to financial close.

13.1.32 IHSL removed the room function ‘HDU’ from the ‘Room Function Reference Sheet’.

13.1.33 IHSL produced certain room data sheets in advance of the contract being concluded.

13.1.34 IHSL’s room data sheets for certain critical care areas set out environmental information, including air changes per hour, that complied with the information in the environmental matrix. This was inconsistent with the guidance set out in SHTM 03-01.

13.1.35 No issue was raised by NHSL in relation to the environmental information in IHSL’s room data sheets for critical care areas in the period prior to conclusion of the contract.

13.1.36 In October 2014, environmental information for single bedrooms within IHSL’s environmental matrix was identified by the Board of NHSL as potentially non-compliant with SHTM03-01.

13.1.37 This was disputed by IHSL. IHSL maintained that it was proposing a mixed mode ventilation system – comprising of natural ventilation and mechanical ventilation - which complied with SHTM03-01.

13.1.38 NHS NSS corresponded with NHSL in relation to this dispute and expressed surprise that NHSL was considering having opening windows as part of the ventilation system.

13.1.39 In January 2015, the Board of NHSL determined that the ventilation design for single bedrooms should not rely on openable windows.

13.1.40 This was not reflected in IHSL’s environmental matrix submitted as part of its final tender.

13.1.41 Notwithstanding this disconnect between what the Board of NHSL wished and the solution being offered by IHSL, NHSL did not insist on any changes being made to IHSL's tender (including the environmental matrix submitted by IHSL) before a contract was signed.

13.1.42 NHSL agreed to waive the requirement for the preferred bidder to produce room data sheets for every space in the hospital by Financial Close.

13.1.43 NHSL entered into a contract with IHSL which stipulated that the environmental matrix would be 'Reviewable Design Data' under the contract. Therefore, the precise parameters for the ventilation system would be worked out after the contract was concluded.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Provisional Position Paper 3

The Procurement Process for the Royal Hospital for Children and Young People and Department of Clinical Neurosciences

Volume 1: The Period up to the Close of Competitive Dialogue

Purpose of the Paper

This Provisional Position Paper has been produced to assist the Chair in addressing the terms of reference. It outlines the Inquiry Team's understanding of the procurement process for the award of the contract for the Royal Hospital for Children and Young People and Department of Clinical Neurosciences (RHCYP/DCN) project (the Project). Volume 1 addresses the period from the commencement of the procurement exercise up to the close of competitive dialogue. Volume 2 will address the period from the close of competitive dialogue to the conclusion of the contract. Gaps in the Inquiry Team's understanding are also identified in both volumes. These matters will require to be explored in greater detail at the hearing set to commence on 24 April 2023. Further papers have been produced in relation to the development of the Reference Design and the Environmental Matrix.

An earlier draft of this paper was circulated to Core Participants (CP) for consideration and comment. Those comments have been considered by the Inquiry Team and taken into account in finalising this paper.

In due course, the Chair is likely to be invited by the Inquiry Team to make findings in fact based on the content of this paper. The Inquiry Team does not presently intend to lead further detailed evidence on the matters outlined in it, except where there are gaps in the Inquiry's understanding of the procurement exercise. However, it is inevitable that some of the matters covered in the paper will be touched upon to a greater or lesser extent in the hearing set to commence on 24 April 2023. In addition, it is open to any CP – through evidence or submissions – to seek to correct and/or contradict it. It is therefore possible that the Inquiry's understanding of matters set out in the paper may change, and so the position set out in this paper remains provisional. If it is the case that the Inquiry's understanding does change significantly, a revised edition of this paper may be published in due course.

Contents

1. Introduction & Overview of the Procurement Process

1.1 Following the approval of the Outline Business Case for the Project, NHS Lothian (NHSL) required to conduct a procurement exercise for the Project. The key stages in the procurement process were as follows:

(i) Publication of the Contract Notice – on 5 December 2012
The publication of the contract notice in the Official Journal of the European Union signalled the start of the procurement process. It informed interested parties of the procedure that would be adopted, the value of the contract to be awarded and the procedures that would be adopted for the award of the contract. It stated that variant bids would not be accepted. The estimated value of the contract opportunity (excluding VAT) was between £140,000,000 and £165,000,000.

(ii) Information Memorandum and Pre-qualification questionnaire – 5 December 2012.
The Information Memorandum (IM) and Pre-Qualification Questionnaire sought to identify prospective tenderers to invite to participate in dialogue. NHSL stated in the IM that its vision was to create a world-class facility. It confirmed that no variant bids would be accepted.

(iii) Invitation to Participate in Dialogue (ITPD) – 12 March 2013
The ITPD set out more detail on the procurement process and the procedure for assessing the most economically advantageous tender. NHSL's requirements were detailed in the ITPD.

(iv) Competitive dialogue procedure – 12 March 2013 – 13 December 2013
The ITPD set out how the competitive dialogue procedure would work. In short, a series of dialogue meetings would take place with tenderers

to discuss the development of their proposals before NHSL invited final tenders to be submitted.

(v) Invitation to Submit Final Tenders – 16 December 2013
NHSL concluded the competitive dialogue stage on 13 December 2013 and invited the submission of final tenders on 16 December 2012 by issuing a letter to bidders along with a document entitled 'Invitation to Submit Final Tenders' (ISFT) volumes 1 to 3. On 13 January 2014, final tenders were submitted by three tenderers.

(vi) Assessment of tenders and identification of Preferred Bidder – 5 March 2014
NHSL required to assess the tenders against the published criteria to ascertain the most economically advantageous tenderer. A preferred bidder was identified. No formal contract was awarded or concluded at this stage.

(vii) Publication of the Contract Award Decision – 25 March 2015
NHSL published a notice confirming the contract award. IHS Lothian Limited (IHSL) was the economic operator awarded the contract. The value of the contract was £150,014,000.

(viii) Conclusion of Contract and Financial Close – 12 to 13 February 2015
The contract was formally concluded between NHSL and IHSL.

2. Legal Principles

2.1 NHSL required to conduct the procurement exercise for the RHCYP/DCN in compliance with the Public Contracts (Scotland) Regulations 2012 (the 2012 Regulations). That was because the value of the proposed public contract was above the relevant financial threshold for the 2012 Regulations to be engaged.

2.2 The 2012 Regulations consolidated Scots law in relation to public procurement. They gave effect to: Directive 2004/18/EC of the European Parliament and Council of 31st March 2004 on the co-ordination of procedures for the award of public works contracts, public supply contracts and public services; Directive 89/665/EEC of 21st December 1989 on the co-ordination of the laws, regulation and administrative provisions relating to the application of review procedures to the award of public supply and public works contracts, as amended; and Directive 2007/66/EC of the European Parliament and Council of 11th December 2007 amending Council Directives 89/665/EEC and 92/13/EEC with regard to improving the effectiveness of review procedures concerning the award of public contracts.

2.3 The 2012 Regulations sought to ensure open and fair competition for public contracts. The 2012 Regulations set out the procedures to be followed at each stage of a procurement process from the publication of a contract notice (the formal start of the process) through to the publication of the contract award notice (formally concluding the process and stating the party that was to be awarded the contract opportunity).

2.4 Regulation 4(3) of the 2012 Regulations required a contracting authority, at all stages of the procurement exercise, to:

(a) treat economic operators equally and without discrimination; and

(b) act in a transparent and proportionate manner.

2.5 For example, documents issued to prospective tenderers required to be drafted in a manner that would allow for uniform interpretation. Otherwise, the documentation would lack transparency. The courts adopt an objective standard when interpreting procurement documents. The key issue is how the document would be interpreted by the “reasonably well informed and normally diligent tenderer” (the RWIND Tenderer) (Healthcare at Home Ltd v Common Services Agency 2014 SC (UKSC) 247). The documentation must be sufficiently clear to permit of uniform interpretation by all RWIND tenderers.

2.6 The 2012 Regulations contained a range of options in terms of procedure. These included the ‘open procedure’, ‘restricted procedure’, ‘negotiated procedure’ and ‘competitive dialogue procedure’. For ‘particularly complex contracts’, where a contracting authority considered that the use of the open or restricted procedure would not allow for the award of the contract, the contracting authority could use the ‘competitive dialogue procedure’.

2.7 A ‘particularly complex contract’ was defined in regulation 18(1) as meaning a contract:

> “…where a contracting authority is not objectively able to –
>
> (a) define the technical means…capable of satisfying its needs or objectives; or
> (b) specify either the legal or financial make-up of a project or both”

2.8 The contracting authority required to ensure that the number of economic operators invited to participate in the dialogue was sufficient to ensure genuine competition (Regulation 18(13)).

2.9 The 2012 Regulations provided that during the competitive dialogue procedure, a contracting authority:

> “(a) may discuss all aspects of the contract with the participants selected;
>
> (b) must ensure equality of treatment among all participants and, in particular, must not provide information in a discriminatory manner which may give some participants an advantage over others; and
>
> (c) must not reveal to the other participants solutions proposed or any confidential information communicated by a participant without that participant’s agreement.
>
> (Regulation 18(22))”

2.10 The contracting authority was entitled to conduct dialogue in successive stages. The contracting authority was also entitled to continue the competitive dialogue procedure until it could identify one or more solutions, if necessary, after comparing them, capable of meeting its needs (Regulation 18(25)).

2.11 In terms of regulation 18(26) of the 2012 Regulations, when the contracting authority declared that the dialogue stage was concluded, it required to:

(a) inform each participant that the dialogue had concluded;

(b) request each participant to submit a final tender containing all the elements required and necessary for the performance of the project on the basis of any solution presented and specified during the dialogue; and

(c) specify in the 'invitation to submit a tender' the final date for the receipt of tenders.

2.12 The contracting authority was permitted to make a request for a participant to clarify, specify or fine-tune a tender referred to in regulation 18(26)(b). However, such clarification, specification, fine-tuning or additional information could not involve changes to the basic features of the tender if those variations were likely to distort competition or have a discriminatory effect (Regulation 18(27)).

2.13 The contracting authority required to assess the tenders received on the basis of the award criteria specified in the contract notice, or descriptive document, and required to award the contract to the participant that submitted the most economically advantageous tender (Regulation 18(28)).

2.14 The contracting authority was entitled to request the participant identified as having submitted the most economically advantageous tender to clarify aspects of that tender, or confirm commitments contained in the tender, provided that any such request did not have the effect of modifying substantial aspects of the tender and did not risk distorting competition or causing discrimination (Regulation 18(29)).

2.15 The contracting authority could specify that payments were to be made to a participant in respect of the participant's expenses incurred in participating in the competitive dialogue procedure (Regulation 18(30). However, payment was optional rather than mandatory.

2.16 In terms of regulation 31, a contracting authority which awarded a public contract is required, no later than 48 days after the award, to send to the Official Journal of the European Union a notice, in the form of the contract award notice in Annex III to Commission Regulation (EC) No. 1564/2005 including the information therein specified.

2.17 A contracting authority is also required to inform any economic operator that submitted a tender, of its decision in relation to the award of the contract by way of a notice in writing (Regulation 32). The notice is required to include:

"(a) the criteria for the award of the contract;

(b) where practicable, the score obtained by–

(i) the economic operator receiving the notice; and

(ii) the economic operator to be awarded the contract;

(c) the name of the economic operator to be awarded the contract;

(d) in the case of an unsuccessful tenderer, a summary of the reasons why the tenderer was unsuccessful;

(e) in the case of an unsuccessful tenderer, the characteristics and relative advantages of the successful tender; and

(f) a precise statement of the standstill period that would apply before the award of the contract."

2.18 The 2012 Regulations imposed a standstill period before a contract could be awarded. A contracting authority required to allow the relevant standstill period to elapse before formally concluding any contract.

2.19 The obligations imposed on a contracting authority by the 2012 Regulations mirrored underlying principles of European law. Procurement exercises, with the potential for cross-border interest, had to comply with Community obligations in addition to the 2012 Regulations. These obligations include transparency, objectivity, proportionality and non-discrimination (Henry Brothers (Magherafelt) & Others v Department for Education for Northern Ireland [2007] NIQB 116).

2.20 The obligations imposed on a contracting authority do not end at the conclusion of the contract. Any proposed 'material' change to an awarded contract could trigger the need for a new procurement exercise to be conducted (Pressetext Nachrichtenagenteur [2008] ECR I-4401 (hereinafter "Pressetext"). A proposed change will be material if it introduces conditions which, had they been part of the initial award procedure, would have allowed for the admission of tenderers other than those initially admitted or would have allowed for the acceptance of a tender other than the one initially accepted (Wall (C-91/08, 13 April 2010), at paragraphs 37-38). A change will be material if it extends a contract to include the provision of services that were not initially covered in the procurement exercise or if the change alters the economic balance of the contract in favour of a contractor in a manner not provided for in the original contract (Pressetext, paragraph 37).

3. Roles in the Project

3.1 The governance arrangements in respect of reporting structure, oversight and assurance, and project team structure, changed at various stages of the project. The key roles during the procurement phase following Outline Business Case approval are set out below.

3.2 NHSL was the contracting authority for the purposes of the 2012 Regulations. It was the 'client/owner' with overall responsibility for the procurement of the Project. The project governance arrangements agreed up to the appointment of the preferred bidder were set out in a paper for the Royal Hospital for Sick Children (RHSC) and DCN Re-provision Project Steering Board on 14 December 2012, which was noted with amendments. The Investment

Decision-Maker (IDM) was the Board of NHSL, which was ultimately accountable for the project. The Board delegated oversight of the Project to the Finance and Performance Review Committee (F&PRC), which changed its name to the Finance and Resources Committee (F&RC) in December 2012. NHSL's director of finance was the 'Project Owner'. The 'Project Owner' had the executive responsibility for decision making relating to the Project. The F&PRC established a Project Steering Board (PSB), chaired by the Project Owner.

3.3 The PSB's remit was:

- To assist the Project Owner and Project Director in the decision-making process for issues relating to the project
- To support the Project Owner and Project Director in preparing submissions to the F&RC, to satisfy that Committee's assurance needs on governance and internal control and monitoring of key performance milestones
- To serve as the Capital Management Group, with delegated authority to approve capital enabling works for the Project up to £250,000, and will be the first place to review schemes higher than £250,000
- To be the arbiter of matters arising from the implementation of the Project Design and the Strategic Delivery Programme

3.4 PSB membership included:

- Project Owner (chair)
- Project Director
- Medical Director
- Non-executive member(s) of the Board of NHSL
- A representative from the service

- Project Clinical Director
- Director of Capital Planning and Projects
- Associate Director of Finance
- Project Operational Lead
- Communications Manager
- A representative from the Lothian Partnership Forum
- A representative from the South-East & Tayside Regional Planning Group (SEAT)
- A representative from the Scottish Government
- A representative from the Scottish Futures Trust

3.5 NHSL's technical advisors were Mott MacDonald (MM). They were appointed in terms of a contract signed on 13 June 2011 and 11 October 2011, with a service commencement date of 22 March 2011.

3.6 As technical advisor, MM advised NHSL on how to set out the technical specifications for construction works, prepared all the technical schedules and drafted the invitation to participate in dialogue (ITPD). MM drafted the documents with input from MacRoberts and Ernst & Young (NHS Lothian's legal and commercial and financial advisers respectively). Thomson Gray, acting through MM, were cost consultants.

3.7 This was not MM's first involvement in the wider project for a new children's hospital. MM had been involved at an earlier stage when the project was to be capital funded. MM was originally the New Engineering Contract (NEC) Supervisor appointed under the under Frameworks Scotland agreement. That appointment was terminated when the project switched to being funded through a Non-Profit Distributing model (NPD), and MM was reappointed through a different procurement route, the OGC Catalyst framework agreement for Multi-Disciplinary Services. According to a High Level Review

of Project Arrangements conducted by PWC, MM's previous involvement in the project was a key reason for their re-appointment for the role.

3.8 MM engaged with NHSL to appoint a number of sub-contractors, also with previous experience of the project. On 10 May 2011, Davis Langdon was appointed by MM as a sub-consultant with a project management and technical advisory role. MM and Davis Langdon appointed a Reference Design Team made up of sub-contractors, with a member from NHSL taking a project interface role.

3.9 According to a Project Execution Plan, dated September 2011, NHSL's Project Director led the Project Team, made up of the NHSL Project Delivery Team and the Advisory Team. The Project Director was supported by the Commission Director and Commission Manager from MM and Lead Project Manager from Davis Langdon. Together they made up the Project Management Executive. NHSL's delivery team worked with advisors on a number of groups and workstreams, including the Business Case Task Group, and the Procurement, Commercial, Design and Construction and Facilities Management workstreams.

3.10 The Project was to be funded by way of a Non-Profit Distributing model (NPD). Scottish Futures Trust (SFT) was established as a national centre of expertise in infrastructure procurement. SFT provided assistance and expertise in relation to the management of the NPD programme. SFT had a dual role in the project: a 'support' role to provide advice to NHSL regarding NPD procurement; and an 'oversight' role.

3.11 SFT sat on the Project Steering Board and attended meetings of the commercial sub-group and procurement workstream of the Project.

3.12 SFT also sought to ensure value for money for the Scottish Government, by carrying out Key Stage Reviews (KSRs) for the Project. In addition, SFT provided input to SG's Capital Investment Group (CIG) during the approval process for the Outline Business Case and Full Business Case for the Project.

3.13 SFT sat on the Infrastructure Investment Board (IIB), which has an oversight role over all infrastructure procurement in Scotland. SFT's oversight role extended to the terms of the standard NPD project agreement and the financing terms agreed with the preferred bidder. NHSL raised operational matters directly with SFT and, if required, through NHSL's governance structures, such as at the Project Steering Board where senior representatives of SFT were present.

3.14 Scottish Government Health Directorate (SGHD) was the government sponsor department for the Project. SGHD has ultimate responsibility for health services in Scotland. SGHD made the decision on how the project was to be funded, namely by way of an NPD model rather than a capital model. It approved the business cases and provided the funding for the RHCYP/DCN Project.

3.15 The Scottish Capital Investment Manual (SCIM) sets out the procurement process to be followed for schemes procured under Public Private Partnerships (PPPs) or the NPD model in the NHS in Scotland. It includes guidance on the business case process. SFT was involved in revising the 2009 version of the SCIM Public Private Partnership (PPP) Guide to capture NPD-specific requirements.

3.16 The CIG reviewed all business case stages, including the outline business case and full business case, to recommend approval. Approval would be issued by the Chief Executive, Director General or Ministers of the SGHD. As part of their consideration of the business cases, CIG used Scottish Futures Trust's KSRs and other special input. The chair of the CIG was the Scottish Government Deputy Director (Capital Planning and Asset Management) within the Health and Social Care Directorates.

3.17 While the Scottish Government had responsibility for financing the Project, the Inquiry Team understands that it was NHSL that made the operational decisions in relation to the procurement phase of the Project.

3.18 Health Facilities Scotland (HFS) is a division of NHS National Services Scotland. It is the NHS' centre of expertise on technical aspects of facilities and the healthcare built environment. HFS is responsible for developing, publishing and maintaining technical standards. HFS managed the Frameworks Scotland programme under which the RHSC re-provision project was originally developed prior to the switch to NPD funding. Following this switch, HFS did not have a direct role in the procurement process for the RHCYP/DCN.

3.19 HFS could also be called upon, on an ad hoc basis, to advise on specific issues. For example, any queries related to published guidance such as Scottish Health Technical Memorandums (SHTMs).

3.20 In 2011, HFS was asked to comment on an Independent Design Review commissioned by SFT. The Independent Design Review undertaken by Atkins Consultants Ltd (the Atkins Report) assessed 'the capacity of the project to deliver value for money by meeting the strategic aims of the programme; by making best use of space and opportunities for maximising sharing with other assets; and by minimising the whole-life costs,' and did not focus on or contain information relating to the technical aspects of engineering systems. The Inquiry Team understands that HFS was not called upon to advise on, or review, technical information relating to the ventilation system for the RHCYP/DCN prior to a preferred bidder being identified by NHSL.

4. Project Oversight and Assurance

4.1 Following the switch to the NPD model, SFT had a significant role in project assurance, by carrying out 'Key Stage Reviews'. Each review was an assessment of whether the project was suitably developed in terms of 'Project Readiness'; 'Affordability'; 'Value for Money'; and 'Commercial Robustness'.

4.2 The KSR process had operated for PPP projects in Scotland prior to the establishment of SFT by Partnerships UK. Partnerships UK was set up in 2000 to succeed the Treasury Taskforce. The KSR process superseded the Gateway Review procedure for NPD Projects.

4.3 Scottish Government raised the issue of whether there was a potential conflict between SFT's advisory role on the Project Board and its role in project assurance/review.

4.4 The potential conflict was addressed within SFT by separating the role of providing advice on the Project Board and the role of undertaking project assurance through KSRs. SFT's role was clarified by Peter Reekie and Mike Baxter at the Project Steering Board on 25 January 2013.

4.5 SFT's role is set out in a number of documents including:

i. letter from the Scottish Government to the NHS Board Chief Executives dated 22 March 2011.

ii. letter from Peter Reekie on behalf of SFT, to Jackie Sansbury, of NHSL, dated 1 June 2011.

iii. email exchange between Barry White (SFT Chief Executive) and James Barbour (Chief Executive of NHSL) on 22 July 2011.

iv. document entitled 'Role of SFT in Project Delivery – RHSC/DCN Project' dated 21 July 2011.

v. SFT guidance, 'Validation of Revenue Funded Projects, the Key Stage Review Process', December 2011

vi. SFT document titled 'Project Assurance', May 2013.

4.6 'Project Assurance' (document vi above) outlined how SFT would undertake the KSR process:

"7. SFT Resourcing of KSRs

…KSRs provide a formal checklist for project teams to consider in relation to their project and also provide a benchmarking opportunity to test the readiness of projects in advance of key milestones in the procurement process. They are designed to require the reviewer, as well as the reviewee, to consider whether the project teams: a) have sufficient clarity

over the requirements of the competitive dialogue process, b) have the necessary information and resources available for the tender process to be run efficiently and c) are satisfied that the project will produce a good value for money outcome. In order to ensure a degree of separation between the immediate project team and project sponsoring department and to incorporate external commercial expertise…

…SFT resources KSRs by assembling a small team internally to undertake each review. These review teams normally consist of individuals not directly involved with the specific project. This approach ensures that KSRs are carried out with no external cost to SFT or the project sponsor. In addition, in line with SFT's evolving approach to supporting the revenue funded investment programme the approach to carrying out validation was remodelled during 2011 to remove the burden on project teams in providing additional background information together with completed KSR checklists to reviewers unfamiliar with the specific circumstances of each project. These KSR checklists are now completed by the relevant SFT staff member as part of his or her ongoing project support role. This reduces the overall delay impact of reviews and ensures that the review process is integrated into the overall project development. It also allows relevant aspects of the review to be considered on an ongoing basis.

In order to preserve the integrity of independent assurance each KSR report is separately reviewed and signed off by a member of the SFT senior management team unconnected with the project. Consequently, the KSR pro-forma checklists have been updated and relevant guidance made available to project teams as well as SFT staff members undertaking KSRs.

The approach has now been fully operational for 12 months and feedback from project teams and sponsors has been entirely positive."

4.7 SFT's dual role was also expected to provide benefits in respect of oversight. With SFT sitting on the Project Board and advising on ad hoc issues it was

anticipated that SFT would be alert to issues as they arose and could help to resolve them with NHSL without needing to escalate the matter to the Scottish Government. According to the document prepared by SFT entitled 'Role of SFT in Project Delivery – RHSC/DCN Project':

> "...In the unlikely event that agreement on key issues cannot be reached then a three way discussion would take place between the Chief Executives of SFT and NHS Lothian and the Finance Director of NHS Scotland. Beyond that, referral to firstly the Infrastructure Investment Board and secondly Ministers remain as options should very significant issues remain unresolved.
>
> The benefit of SFT's dual role is to reduce the chances of significant issues being raised during the approvals process or elsewhere and therefore reduce the chances of delay to the Project."

4.8 The Inquiry Team understands that KSRs do not have a strong focus on technical details and do not expressly consider compliance with SHTMs. However, in conducting KSRs, SFT would seek assurance on a number of aspects of the project which may include, for example, compliance with Project requirements. KSRs are the point at which issues or risks could be flagged and highlighted.

5. Guidance and Stages of the Procurement Process

5.1 Some of the guidance relating to NPD projects was still being developed when the procurement process started for the RHCYP and DCN project. Although certain guidance may not have been published, SFT provided NHSL with NPD-specific advice.

5.2 The guidance below was applicable to the procurement process of the RHCYP and DCN re-provision project from the date of publication:

1) Treasury Green Book, 2003

2) Procurement Handbook and Scottish Procurement Policy Notes, 2008

3) Scottish Government's General Procurement Guidance – Competitive Dialogue

4) Scottish Capital Investment Manual (SCIM) 2009 with amendments

5) SCIM Supporting Guidance: Design Assessment in the Business Case Process (2011)

6) Scottish Government Construction Procurement Manual

7) Scottish Public Finance Manual, 2011

8) A policy on Design Quality for NHSScotland, CEL (2010) 19 read in conjunction with the accompanying 'SCIM Supporting Guidance: Design Assessment in the Business Case Process (2011)', specifically section 1.4 Transitional Arrangements. Prior to 2 June 2010, 'A policy on design quality for NHSScotland' HDL (2006) 582 would have applied.

9) Policy on Sustainable Development for NHSScotland, CEL (2012) 23

10) Prior to 25 January 2012, 'Environmental Management Policy for NHSScotland' HDL (2006) 214 would have applied.

11) Scottish Futures Trust (SFT) Validation of Revenue Funded Projects: The Key Stage Review Process Information Note to Projects, 2011

12) SFT Value for Money (VfM) Assessment Guidance, 2011

13) SFT Value for Money Supplementary Guidance for projects in £2.5 billion Revenue Funded Investment Programme October 2011

14) SFT NPD Guidance Note on Approach to Tender Evaluation, 2013

15) SFT, Standard Project Agreements (hub DBFM & NPD Model) User's Guide June 2011.

16) SFT, Standard Project Agreements (hub DBFM & NPD Model) User's Guide June 2012.

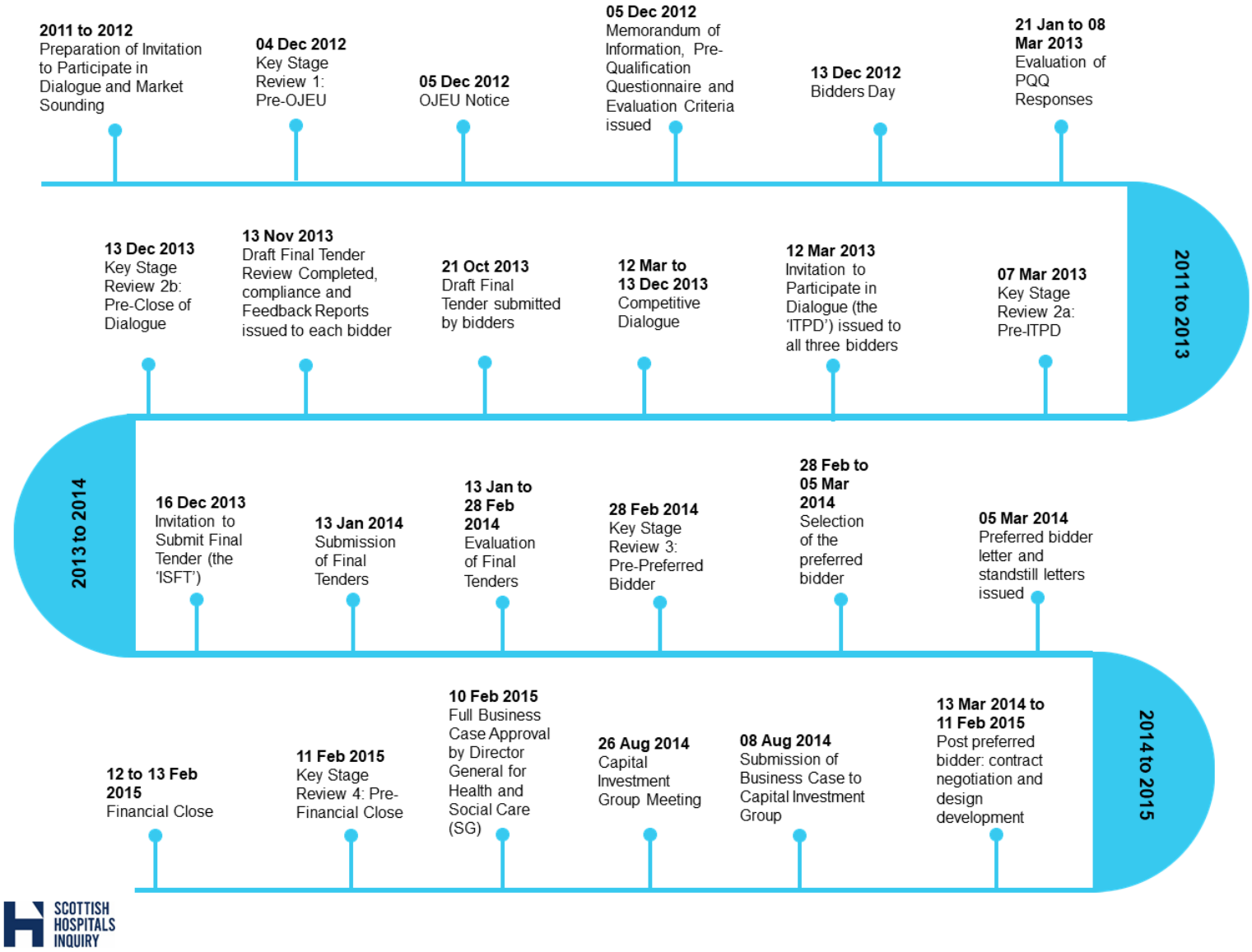
5.3 SFT prepared the following standard NPD contract documents:

1) SFT, Standard Form Project Agreement (NPD Model) 2 June 2012
2) SFT, Standard Form Project Agreement (NPD Model) July 2011
3) SFT NPD Articles of Association, 2011
4) SFT NPD Articles of Association, 2012
5) SFT NPD Articles of Association, Nov 2014 ESA amendments
6) SFT NPD Articles of Association, Feb 2015

5.4 Procurement timeline with dates

Preparation of Invitation to Participate in Dialogue and Market Sounding	2011- 2012
Key Stage Review 1: Pre-OJEU	4 December 2012
OJEU Notice	5 December 2012
Memorandum of Information, Pre-Qualification Questionnaire and Evaluation Criteria issued	5 December 2012
Bidders Day	13 December 2012
Evaluation of PQQ Responses	21 January 2013 to 8 March 2013
Key Stage Review 2a: Pre-ITPD	7 March 2013
Invitation to Participate in Dialogue ('the ITPD') issued to all three bidders	12 March 2013
Competitive Dialogue	12 March 2013 – 13 December 2013
Draft Final Tender submitted by bidders	21 October 2013

Draft Final Tender Review completed, Compliance and Feedback Reports issued to each bidder	13 November 2013
Key Stage Review 2b: Pre-Close of Dialogue	13 December 2013
Invitation to Submit Final Tender (the 'ISFT') issued to all three bidders	16 December 2013
Submission of Final Tenders	13 January 2014
Evaluation of Final Tenders	13 January 2014 to 28 February 2014
Key Stage Review 3: Pre-Preferred Bidder	28 February 2014
Selection of the preferred bidder	28 February – 5 March 2014
Preferred Bidder Letter and standstill letters issued	5 March 2014
Post preferred bidder: Contract Negotiation and Design Development	13 March 2014 to 11 February 2015
Submission of Business Case to Capital Investment Group	8 August 2014
Capital Investment Group Meeting	26 August 2014
Full Business Case Approval by Director General for Health and Social Care	10 February 2014
Key Stage Review 4: Pre-Financial Close	11 February 2015
Financial Close	12 February 2015 – 13 February 2015



SCOTTISH HOSPITALS INQUIRY

6. Preparation for Procurement

6.1 During 2011 and 2012 NHSL, with the assistance of advisers and SFT, planned how to undertake the procurement of the RHCYP/DCN Project. This included: market sounding; progressing the design; preparing a programme with target dates for key milestones and preparing the Invitation to Participate in Dialogue (ITPD) which marks the start of a period of Competitive Dialogue.

6.2 Competitive Dialogue is a process through which bidders engage with the procuring authority to refine tender submissions to ensure they meet the contracting authority's stated requirements. At the end of Competitive Dialogue, the final tenders are evaluated by a Core Evaluation Team in accordance with the agreed evaluation criteria and methodology. Detail on the Competitive Dialogue process, tender submission requirements, the evaluation criteria and weightings, and the Board's Construction Requirements for the Project are all contained within the ITPD.

6.3 Market Sounding

6.3.1 Market Sounding usually takes place before the publication of the contract notice. According to the SCIM NPD Guide Section 2: From OJEU to Contract Award, market sounding is useful in situations where assessment of the viability of the project reveals it to be 'borderline', or there are unusual elements in the project. Approaching the market should provide insight into the likely level of interest in the market but without giving any one potential participant a head start in the procurement process. Actions taken at this stage must not prejudice the future procurement process.

6.3.2 SFT carried out programme level market sounding. This involved speaking to market participants to gather insight as to whether there would be bidders for the project and whether or not the project would be 'bankable'. The principal question of the market sounding was "is there a market for 25-year project finance?" That was anticipated to be the greatest challenge in the period following the global financial crisis.

6.3.3 Prior to the procurement process, MM and Davis Langdon spoke to contractors about the intention to go to market. The aim was to explore the market's reactions to the potential procurement options under consideration, specifically, the extent to which NHSL would develop the design of the hospital, and which aspects of the design would be the responsibility of bidders. The options were as follows:

- Option A – Mandate Clinical Functionality;
- Option B – Mandate Full Design;
- Option C - Mandate More Detailed Exam and Novate; and
- Option D – Exemplar Design

6.3.4 This is referred to at section 5 of the paper titled: 'NHS Lothian RHSC + DCN Little France – Procurement Options' (June 2011) which states:

"5. Soft Market Testing. A soft market testing exercise was conducted to gauge the market's view on the above proposals. The organisations approached were Morgan Sindall, Brookfield, Galliford Try Investments and Morrison Construction. Each respondent was asked if it they were interested in bidding the project as an NPD. All except 1 confirmed they would be. Each respondent was advised of the option A, B & C approach. The consensus was that bidders would prefer the design to be treated as an exemplar to enable them to have the freedom to truly innovate on the project. Whilst option A gives some degree of flexibility, this was considered to be fairly limited. None of the respondents could see a benefit in Option B over options A & C. And this was considered to be the least favourable. Given that clinical functionality is being fixed under Option A and the ability to innovate is limited by this, all of the respondents preferred Option C primarily because it significantly reduces bid costs. All respondents confirmed that they would be comfortable with a full risk transfer under all 3 options (with the exception of clinical functionality). None of the respondents expressed a concern about the

incumbent design team joining another bidder. The respondents felt that they can engage with other designers who may be able to significantly improve what has been carried out to date."

6.3.5 Project-specific market testing was also undertaken by NHSL, described in the Pre-OJEU Key Stage Review:

"NHS Lothian's Project Director and Director of Capital Planning & Projects have responded to market interest in the project by meeting with representatives of firms potentially interested in bidding for the project.

These meetings commenced from shortly after the procurement route change and have continued to the current date. It is planned that these informal discussions will cease before publication of the OJEU notice.

There have been a variety of bid managers and similar coming forward and the Board representatives have received differing levels of assurance as to the respective corporate interest and depth of consortium members in the project - see abridged list attached.

It is clear from the meetings that initial concerns over a dominant bidder have been alleviated, subject to this being borne out through procurement contract documentation.

Similarly, all the interested parties have indicated high level engagement with SFT regarding the project as part of the NPD programme. NHS Lothian has not been represented at SFT meetings, but the project working group has received feedback from SFT consistent with our informal discussions.

The abridged list attached has been produced for the sole purpose of CIG consideration of the Outline Business Case and should not be more widely distributed.

The Board at this time cannot confirm that there will be multiple bidders as that will be dependent on a positive response from the market to the project…"

"The Project Director and Director of Capital Planning & Projects and/or Associate Director of Finance have met with the following parties (listed alphabetically) to maximise their knowledge of the project, pre-procurement, and to elicit the levels of interest forthcoming. Where a consortium has been identified, this is shown as a single entry.

All have demonstrated a track record in major UK healthcare/PFI/PPP projects, except FCC whose experience is international.

1. BAM/Balfour Beatty

2. Bouygues

3. Brookfield

4. Carillion

5. FCC

6. John Laing Investments/Laing O Rourke

7. Skanska/Miller

More recently, Carillion advised that it did not intend to bid and the Board considers that Bouygues and FCC are not likely to proceed".

6.4 Reference Design

6.4.1 On 12 January 2011 the Finance and Performance Review Committee approved the use of a reference design for the RHCYP/DCN project. The Reference Design essentially involved providing bidders with a more developed design than would otherwise be the case with an exemplar approach and was a factor in decisions regarding the programme for procurement, and the tender evaluation criteria and weightings. It also had implications for what bidders were expected to produce in their final tenders, and how the requirements for bidders were set out in the ITPD. MM developed and advised on the 'Approach to Reference Design' in 2011 and 2012. The Reference Design is the subject of a separate Provisional Position Paper by the Inquiry Team.

6.4.2 A reason for choosing a reference design approach was to retain as much of the design work already undertaken before the Project switched to a different funding model. Amongst the design work already in development was an 'Environmental Matrix' (EM), prepared by Hulley and Kirkwood (H&K). H&K were M&E engineering consultants sub-contracted by MM when the Project was being procured under Frameworks Scotland and appointed again to form part of the Reference Design team in 2011.

6.4.3 The EM set out the environmental conditions for all the rooms in the hospital. This included the specifications for the ventilation system. The EM is addressed in a separate PPP. The EM was included within the Invitation to Participate in Dialogue (ITPD) that was sent to all bidders. The ITPD outlined NHSL's requirements for the hospital and explained what bidders would need to submit in their final tenders to demonstrate that they could meet those requirements, or they would need to highlight derogations.

6.5 Procurement Programme

6.5.1 All parties were concerned about the timescale for the Project and wished to avoid unnecessary delay. The Project Steering Board Action Notes of a meeting of 13 May 2011 record that the proposed timetable was unacceptable to NHSL, SFT and SGHD given the estimated slippage in operational date from the previous capital funded project.

6.5.2 SFT was keen to reduce timescales, where possible, without impacting the effectiveness of the process. SFT suggested areas where NHSL could look to shorten the programme.

6.5.3 In June 2011, in a paper titled 'Procurement Paper', Gordon Shirreff (SFT) raised the possibility of 'down selecting' to one bidder. The decision was taken not to down-select. This became a factor in discussions about the programme, described below.

6.5.4 On 27 June 2011 a 'Procurement Workstream Meeting' was held, at which Brian Currie (Project Director, NHSL), Gordon Shirreff (SFT), Denise Kelly

(Davis Langdon), Paul Hampson (MM) and David Cunningham (Davis Langdon) were present. Ahead of that meeting Paul Hampson circulated additional papers to all attendees including, 'Developed procurement/CD programme'. The minutes record:

> "A revised procurement programme was circulated, with suggested days for CD activity included. Discussions took place around format of meetings. Confirmed that allocating 1 full day of dialogue for each bidder during each dialogue cycle was the preferred option. PH/DK/DC to consider how ISOS and ISDS should be handled. Initial thoughts are that these interim phases should be high level review of activity and direction rather than full evaluation given that bidders will also submit a draft final tender as part of the procurement process. This will be reviewed at the next workstream meeting".

6.5.5 The Minutes of the Project Steering Board Meeting of 11 May 2012 note amongst the benefits of the Reference design that it "shortens Competitive Dialogue Phase" and "minimises abortive design cost for unsuccessful bidders."

6.5.6 On 24 October 2012, Donna Stevenson (Associate Director, SFT) emailed Brian Currie (NHSL) in relation to the programme, stating:

> " …Programme and Down selection. We think that the programme is longer than it need be in certain respects…In the context of the Board's view that there [sic] all three bidders should be taken through to final tender we consider that the dialogue period of over 8 months could be shortened particularly in the context of the advanced stage of the reference design and the Board's views on the extent of mandatory elements. The other area where we consider that there is the potential for a reduction in timescale is the period for return of tenders and evaluation, in the dialogue and draft final tenders process."

6.5.7 At a project meeting with SFT regarding "Procurement and Competitive Dialogue Issues", held on 26 October 2012, the following points were raised:

"…SFT's view that a reference design approach allows for less design development through competitive dialogue, therefore lower costs for bidders than without. However, it also increases the threshold for bidder engagement in the first instance. With the market being wary of bid costs, a longer programme is a disincentive.

…

Down selection would take extra time as a step not yet accounted for. It would improve the chances of bidders committed to final submission costs and could therefore be popular with the market.

Discussion re: shortening competitive dialogue period to lengthen time from appointment of preferred bidder to financial close.

[Susan Goldsmith (NHS Lothian)] expressed anxiety if bidders reduced from three to two, particularly if one of the bidders was associated with the current PFI partner. Taking three bidders from ITPD to final submission continues to be NHSL's preferred route."

6.5.8 The PSB minutes of 9 November 2012 state:

"Project Procurement Update

Further to an email from SFT [Peter Reekie] of 1st November 2012 to NHSL [Susan Goldsmith] instructing NHSL, as a condition of funding, to reduce the current length of Competitive Dialogue and consider down selecting, a proposal has been prepared by the Project Team for the Project Steering Board's consideration.

Down Selection

All agreed that given the particular circumstances of this project and the need to maintain a "level playing field" continuously through the procurement process down selection to two bidders would not be prudent.

Compression of Competitive Dialogue + Tender Evaluation Programme.

SFT reiterated the need to create an attractive as possible proposition to the market given the current economic situation. SFT continued that given the decision not to down select, seen as attractive to the market, there was an ever more pressing need to shorten the Competitive Dialogue process. The use of a Reference Design and a Standard Form of Agreement should, in SFT's view, allow such a compression.

The issue of market attractiveness was queried by BC [Brian Currie] who through soft market testing was only aware of one potentially credible bidder from four who had expressed concern that they may not be able to secure Board approval to bid for the project given the potential bid costs. BC added that one potential bidder had expressed concern that too short a programme may inhibit their ability to offer an appropriate package and sufficiently robust tender to secure their Board approval.

[Mike Baxter] commented that Scottish Government's view was that of SFT's and that there is an established general market view prevailing that the current procurement programme for this project is too long causing difficulties when considering bid intentions.

An alternative compressed programme of some 155 days to close dialogue compared to current duration of 209 days was tabled by BC and the merits or otherwise discussed at length by all parties present. The Evaluation duration has also been shortened from 75 days to 39 days in this alternative programme. Be advised that this programme did give the Project Team a number of concerns, particularly given the complexity of the project.

After much debate, all present unanimously agreed to adopt the compressed programme. NHSL, however, stated that their reservations remain and that in practice the decision to close dialogue would still dictate the achievement of this revised programme.

NHSL to communicate the following actions to the project team immediately:

1 OJEU Notice release date to be set as 26th November 2012.

2 Bidders Day to be set for 3rd December 2012.

3 The PQQ period is to be extended to allow for the Festive Period with a return date of 11th January 2013.

4 The activities and durations proposed in the "Compressed Programme (as per SFT Condition of Funding)" recently prepared are to be adopted in full.

5 Financial Close is to **remain** as 7th August 2014.

6 All other milestones/dates and activities post FC are to remain as the current programme

…

8 Down Selection of Bidders will **not** be adopted. Current strategy to prevail ie., 3 Bidders through to close of dialogue and final tender…"

6.5.9 The revised timetable as of 30 November 2012 was as follows (changes in bold):

Stage	
OJEU Dispatch	**5 December 2012**
Bidders Day	**13 December 2012**
Submission of PQQs	**21 January 2013**
PQQ Evaluation and shortlist	**8 March 2013**
Issue Invitation to Participate in Dialogue to shortlist	**11 March 2013**
Submission of Final Draft Tenders	**30 August 2013**
Submission of Final Tenders	**22 November 2013**
Announce Preferred Bidder	Early 2014

Financial Close & contract award	Summer 2014
Start on site	Autumn 2014
Building operational	Summer 2017

6.6 The Core Evaluation Team and development of tender evaluation criteria and weightings

6.6.1 The PSB was responsible for signing off the tender evaluation criteria and weightings that the Core Evaluation Team would use to assess bidders' proposals and be included in the ITPD. The Inquiry Team's understanding is that bidders would be expected to focus time and resources on elements that, firstly, have a pass or fail scoring and secondly, carry the highest weightings.

6.6.2 Papers presented to the F&PR Committee on 18 April 2012 proposed membership of the Core Evaluation Team and outlined the proposed Scheme of Delegation for Procurement:

> "3.18 The Core Evaluation Team will be led by the Project Director, supported by a lead from each of the technical, financial and legal advisers. In addition, the Project's full time Clinical Director will be on the Core Evaluation Team
>
> 3.19 As agreed by the Committee on 8 February 2012, the Director of Capital Planning & Projects and the Associate Director of Finance will join the core evaluation team for the duration of the procurement phase. In agreement with SFT and SGHSCD, the Director of Capital Planning & Projects will fulfil their requirement for a commercial lead for the Board on the evaluation and competitive dialogue phases through to Financial Close. The Executive Director responsible for the procurement is the Director of Finance. It is important that consistency of membership of the Core Evaluation Team is maintained across the whole bid programme and engagement with bidders.

3.20 The core evaluation team will be supported by specialist groups led by NHS Lothian personnel including Partnership and Facilities. These groups feed into the dialogue process through the core evaluation team and will engage with specific elements of the bidding process appropriate to those functions. These groups will be further supported by the Project Team and advisers, supplemented by identified leads from NHS Lothian Employee Relations, eHealth, Health and Safety and Procurement."

6.6.3 The scheme of delegation was as follows:

"The Project Steering Board will sign off the Invitation to Participate in Dialogue (ITPD) evaluation criteria following technical, legal and financial input and workshops involving members of the Project Steering Board and evaluation groups.

The outcome of the PQQ scoring will be presented to the Project Steering Board, by the Core Evaluation Team, with recommendations that the three highest scoring submissions be invited to proceed to competitive dialogue. The Project Steering Board's recommendation will be brought to the Finance & Performance Review Committee for approval on behalf of the Lothian NHS Board.

In the same way, the outcome of competitive dialogue and the scoring of final submissions will be presented to NHS Lothian Finance & Performance Review Committee with the recommendation from the Project Steering Board, to approve the preferred bidder."

6.6.4 The (Finance and Performance Review) F&PR Committee agreed the membership of the Core Evaluation Team and agreed the proposed scheme of delegation for the non-profit distribution procurement process as outlined in the paper.

6.6.5 The Core Evaluation Team included:

Sorrel Cosens – Project Manager, NHSL

Brian Currie – Project Director, NHSL

Iain Graham – Commercial and Legal Lead, NHSL

Janice Mackenzie – Clinical and Service User Lead, NHSL

Carol Potter – Financial Lead, NHSL

Jackie Sansbury - Operations and Commissioning Lead, NHSL

Andrew Orr – Lead Legal Adviser, MacRoberts

Michael Pryor – Lead Financial Adviser, Ernst & Young

6.6.6 As competitive dialogue was being adopted, the award criteria to be utilised was the "most economically advantageous tender". The factors for evaluating economic advantage of the bid included: period for completion or delivery, quality, aesthetic and functional characteristics, technical merit, after-sales service, technical assistance and price.

6.6.7 According to the SFT NPD Guidance Note on Approach to Tender Evaluation, SFT requires a 60:40 price versus quality split. This is justified in paragraph 5, page 4, where it is stated that:

> "Procuring authorities should be mindful of the fact that, in contrast to previous revenue funded programmes, there is now more scope to manage the risk of poor quality proposals. The reasons for this include (i) use of exemplar/reference designs that give bidders greater clarity on the procuring authority's expectations (ii) a narrower range of FM services to be included in the projects and (iii) opportunity to use the competitive dialogue procedure to ensure that bidders develop proposals that meet the procuring authority's requirements. Combined with a shift in focus in the current financial climate to 'needs' rather than 'wants', and in order to capitalise on the opportunity in the current financial climate to take advantage of competitive pricing, this suggests that it is appropriate for price to carry a heavier emphasis than it perhaps has in the past.

SFT requires that, in the absence of project-specific factors that might indicate otherwise, price carries a weighting of at least 60% and, correspondingly, that quality is weighted at no more than 40%.

In developing a tender evaluation strategy, it will be important to run sensitivities, based on likely bidding scenarios for the project. SFT will review each project's evaluation methodology to ensure that the mechanisms that are applied in scoring the individual elements of price and quality do not undermine the overall relative weightings that they carry."

6.6.8 NHSL were concerned that the 60% weighting for price and 40% weighting for quality undervalued quality. In a paper to the Finance and Performance Review Committee dated 18 April 2012, Susan Goldsmith and Jackie Sansbury explained the approach to be taken by the PSB:

"The evaluation criteria will now be influenced by guidance produced by Scottish Futures Trust for the pipeline of NPD projects. This sets out high level thresholds of at least a 60%/40% weighting for cost and quality. The Project Team are working with the legal, financial and technical advisers to recognise the cost of quality and to ensure that the Board's key quality objectives are fully met. The reference design for the Project already sets a high design quality threshold and bids will be assessed on the basis of pass/fail. A workshop with Project Board representatives and key project stakeholders is to be held shortly to fully define the 'cost of quality' and articulate the detailed design criteria beyond the reference design standard. This has been described as 'what will the Board be willing to pay more for'. This requires to be balanced against the SGHSCD/SFT approach to 'ensure as economic an outturn as possible and not to assume that all the budget is available without challenge'".

6.6.9 Between March and April 2012, NHSL held a first round of workshops to determine the elements that would make up the overall quality score. Workshops were attended by the Core Evaluation team and individuals from

NHSL's advisers, namely MM and Davis Langdon. An ITPD Evaluation Workshop on 'Design and Construct' (which includes mechanical and electrical engineering) took place on 10 April 2012. According to the meeting schedule:

> "The purpose of the workshop is to review and agree in outline, the Design & Construct Evaluation Criteria. The first part of the work shop will be to agree the criteria and then those that should be deemed pass or fail and those that should be marked. Each of the criteria will then be examined in greater detail to obtain agreement, in outline, the issues each of the criteria should address. The importance of each criteria will also be assessed on a high, medium, low scale so that marking can be allocated for agreement with the forum attending at a later date. This will be carried out following a review of the feedback received from the Strategic and Management Evaluation Workshop and the FM Evaluation Workshop."

6.6.10 An NHSL document with the draft ITPD evaluation criteria was produced in advance of the workshop. For 'D8 M&E engineering service design', the document stated that:

> "Bidders shall provide an environmental conditions/room provisions matrix for both mechanical and electrical services for each room in the Facilities.
>
> Whilst Bidders are required to undertake their own design, NHS Lothian has provided draft matrices as part of the ITPD. Bidders are required to complete their matrices in identical format, or confirm general acceptance of NHS Lothian's draft matrices, highlighting differences on an exception basis."

6.6.11 CEL 19 (2010) is addressed in detail in the Reference Design and Environmental Matrix PPPs. It required NHSScotland bodies to utilise room data sheets produced using the ADB (Activity Database) system for briefing, design and commissioning of new hospitals. If a different tool is to be adopted, the onus is placed on the NHS body to demonstrate that it is of equal value. It is not clear to the Inquiry Team why a 'matrix' was adopted by

NHSL and how it had been demonstrated that this approach was of equal value to room data sheets produced using the ADB system. This issue will require to be explored with witnesses at the hearing diet commencing on 24 April 2023.

6.6.12 The first page of the document stated that the scoring approach was 'Scored' as opposed to 'Pass/Fail'. However, the detailed breakdown for D8 proposed the scoring approach as "Pass/Fail or marked to relate to comfort". The comments section stated "high as it relates to environmental comfort".

6.6.13 MM and Davis Langdon also produced a draft of the ITPD evaluation criteria 'for discussion' where M&E engineering service design proposals were scored 'medium'.

6.6.14 A second draft of the ITPD evaluation criteria was produced, dated 24 April 2012. The scoring of D8 "clarity, robustness, quality and level of M&E engineering service design proposals" was now assessed as "medium" with a suggested marking of 1%. No comment has been provided for the change in scoring approach.

6.6.15 A second and third round of workshops were held from June to August 2012 to discuss and agree the criteria and weightings for 'Strategic and Management Approach', 'Design and Construct' and 'Facilities Management', as well as the weightings split between these three categories. The "draft ITPD evaluation criteria calibration scoring" was approved by the Project Steering Board on 10th August 2012.

6.6.16 In June 2012, NHSL's financial advisors, Ernst and Young, provided advice on the evaluation framework for the final evaluation of bids and developed an evaluation methodology that sought to incorporate features that maximise the impact of quality evaluation. The approach, aimed at achieving the desired balance between price and quality while still meeting SFT requirements that price accounts for 60% of the available marks and quality 40%. This was also addressed in a further discussion paper produced in September 2012 entitled "Combining Price and Quality in Evaluation".

6.6.17 According to the paper produced by Ernst and Young in September 2012:

- "The majority of quality evaluation elements are assessed on a pass/fail basis, with the scored element reserved for key differentiating factors.
- Commercial considerations are dealt with entirely within the price score, freeing the available quality marks to be focussed on design, build, FM and management/strategic issues.
- The lowest price bid is awarded the maximum 60 marks. The quality mechanism has been set up so that the highest scoring quality proposals are given the maximum 40 marks, with the quality score of other bids being marked in proportion to this.
- The price marks awarded are calibrated so that proposals that are close in price terms are given similar price marks, thus making the quality score more likely to be the deciding factor. As price differentials become greater, the price marking system becomes more sensitive so that a bid significantly more expensive than the lowest priced will lose a far higher number of price marks."

6.6.18 On 26 October 2012 at a Project Meeting took place with SFT on 'Procurement and Competitive Design Issues'. The paper by Ernst and Young was discussed. According to the minutes of that meeting:

> "PR [Peter Reekie, SFT] emphasised that there was no intention to undervalue quality in the standard form proposed by SFT and that the reference design allows NHSL to specify a high degree of quality in mandatory criteria. SG [Susan Goldsmith, NHSL] accepted that the building will be of good quality, following the work of the reference design to specify the Board's requirements, and highlighted NHSL's need to find a partner for a 25 year relationship beyond construction was a critical quality issue.

It was agreed that the distribution curve used for price evaluation is sensitive. NHSL to focus on finalising the curve and review FM weightings on ITPD questions.

Pass/fail questions

Discussion about questions with a clear compliance threshold that bids could be judged to simply pass or fail. Agreed that NHSL would revisit these questions.

Awarding the maximum quality score to the highest scoring bid

The Project Agreement (PA) outlines the high quality threshold set; any derogations to change the minimum standards suggest that the Project Co are expecting to fail to deliver what NHSL has specified is a quality service. Derogations have to be agreed.

Consensus that there should be a mechanism for adjusting the scores and NHSL will review the legal and commercial elements to be scored against 'price'.

Awarding the maximum score of 40 to the highest scoring bid in terms of quality

Agreed that rather than pursue the proposal to automatically award a maximum score of 40 to the highest quality bid, NHSL would look at calibrating the quality threshold. DO'K [Dennis O' Keeffe] suggested that the quality threshold should be based on performance, process and product.

MB [Mike Baxter, Scottish Government] supported the need to reassure staff and Board members that NHSL will not accept bids below a 'quality threshold', and this should be determined."

6.6.19 Scottish Ministers accept that they were aware of the discussion regarding the percentage weighting for price and quality but consider that this was a decision for NHSL.

6.6.20 In the final ITPD, a pass/fail threshold was used for some elements. This approach was adopted to ensure a minimum standard to which bidders must comply before progressing to the next stage in the procurement process. The scored elements were used to differentiate between bidders who had already met the minimum requirements.

6.6.21 The final break-down of the quality evaluation criteria included within the ITPD was as follows:

Strategic and Management Approach – 5%

Approach to Design and Construction – 23%

Approach to Facilities Management – 12%

6.6.22 The 'Approach to Design and Construction' was made up of 31 separate criteria, of which 12 were scored and the rest assessed on a pass or fail basis.

Quality Evaluation Criteria Reference	Quality Evaluation Criteria	Quality Evaluation Basis	Quality Evaluation Criteria Weighting
C1	Clarity, robustness and quality of approach to meeting the stakeholders requirements in their design	Scored	2.64
C2	Clarity, robustness and quality of approach to design quality	Scored	1.85
C3	Clarity, robustness and quality of architectural and landscape design	Scored	2.64
C4	Clarity, robustness and quality of approach to delivering innovation	Scored	2.64
C5	Clarity, robustness, and quality of approach to adaptability and flexibility	Scored	2.64
C6	Clarity, robustness and quality of way finding and signage proposals	Scored	1.06

Quality Evaluation Criteria Reference	Quality Evaluation Criteria	Quality Evaluation Basis	Quality Evaluation Criteria Weighting
C7	Clarity, robustness and quality of interior design proposals	Scored	2.64
C8	Clarity, robustness and quality of M&E engineering design proposals	Scored	1.06
C9	Clarity, robustness and quality of natural and artificial lighting proposals	Scored	1.06
C10	Clarity, robustness and quality of energy management proposals	Scored	1.85
C11	Clarity, robustness and quality of equipment proposals	Scored	1.06
C11A	Compliance with Minimum Level of Group 1 Equipment	Pass/Fail	
C12	Compliance With Mandatory Reference Design Requirements	Pass/Fail	
C13	Acceptable approach to achieving planning permission	Pass/Fail	
C14	Acceptable vertical and horizontal movement strategy	Pass/Fail	
C15	Acceptable ICT strategy	Pass/Fail	
C16	Acceptable fire planning strategy	Pass/Fail	
C17	Acceptable structural design proposals	Pass/Fail	
C18	Acceptable services, utilities and infrastructure proposals	Pass/Fail	
C19	Acceptable approach to achieving required BREEAM rating	Pass/Fail	
C20	Acceptable post Preferred Bidder stage design development proposals and design programme	Pass/Fail	
C21	Compliance with Board's Construction Requirements	Pass/Fail	
C22	Acceptable design life proposals	Pass/Fail	
C23	Acceptable construction programme and approach to monitoring	Pass/Fail	
C24	Clarity, robustness and quality of construction methodology	Scored	1.85

Quality Evaluation Criteria Reference	Quality Evaluation Criteria	Quality Evaluation Basis	Quality Evaluation Criteria Weighting
C25	Acceptable approach to commissioning and handover	Pass/Fail	
C26	Acceptable approach to quality and environmental management systems	Pass/Fail	
C27	Acceptable approach to health and safety management	Pass/Fail	
C28	Acceptable approach to compliance with CDM regulations	Pass/Fail	
C29	Robustness of technical costs	Pass/Fail	
C30	Acceptable list of summary assumptions, clarifications and derogations	Not scored	
C31	Acceptable Interface Proposals	Pass/Fail	

6.6.23 A 'Pass' would be awarded if the Bidder's approach:

- Demonstrates a satisfactory understanding of the Board's requirements; and
- delivers a satisfactory level of compliance with the Board's requirements.

6.6.24 There was no further elaboration on what would be deemed 'satisfactory'.

6.6.25 C21 concerned 'Compliance with Board's Construction Requirements'. It was scored on a 'Pass/ Fail' basis.

6.6.26 C8 'Clarity, robustness and quality of M&E engineering design proposals' was given a quality evaluation criteria weighting of 1.06. C10 'Clarity, robustness and quality of energy management proposals' was given a weighting of 1.85. These are the elements that relate to bidders proposals for ventilation design. These were lower than other criteria, such as interior design, architectural and landscape design, adaptability and flexibility, which had a score impact of 2.64.

7. OJEU Notice, Pre-Qualification Questionnaire and the Memorandum of Information

7.1 The Project was advertised to prospective bidders through publication of a contract notice in the Official Journal of the European Union (OJEU). According to the Scottish Capital Investment Manual Section 2 paragraph 4.4, the NHS body 'should be ready to issue the Memorandum of Information and a Prequalification Questionnaire to everyone who responds to the contract notice and these documents should be prepared in advance of issuing the contract notice in OJEU.'

7.2 The Scottish Capital Investment Manual Section 2 paragraph 4.5 states, the Memorandum of Information and accompanying Pre-Qualification Questionnaire should aim to:

- "enable potential participants to decide whether they want to continue to be involved in the bidding process by providing appropriate information about the NHS body, the project and its prospects;

- invite expressions of interest in bidding for the project from the private sector;

- obtain information that will establish whether potential participants are technically and financially capable of delivering the project. NPD contracts are complex and expensive to procure. NHSScotland bodies must ensure that only consortia with the appropriate resources and skills-base are selected;

- enable the NHSScotland body to gain an understanding of the economic, financial and technical status and previous experience of the potential participants."

7.3 Regulations 23-26 of the Public Contracts (Scotland) Regulations 2012 set out the criteria for the rejection of economic operators, information as to economic and financial standing and information as to technical or

professional standing that can be used as qualifying criteria to determine the suitability of prospective tenderers.

7.4 According to a report produced for the Finance & Performance Review Committee on 18 April 2012:

> "The OJEU notice has been approved by the Project Steering Board. The date for the Bidders Day to launch the project onto the market cannot be set until approval of the OBC and to proceed to OJEU has been granted.
>
> The information and Pre-qualification Questionnaire (IM/PQQ), with evaluation criteria, have been developed through the Commercial Workstream with NHS Lothian's technical, legal and financial advisers, and with direction from SFT…The content has been approved by the Project Steering Board and the designed documentation will be shared as a final draft with NHS Lothian Directors in mid-April."

7.5 The Outline Business Case was approved on 18 September 2012 although it was noted in the approval letter that the OJEU notice could not be issued until negotiations with Consort regarding enabling works were successfully concluded. On 4 December 2012, Derek Feeley, the Director General Health and Social Care and Chief Executive of NHS Scotland sent a further letter approving the publication of the OJEU notice subject to certain conditions, including the successful completion of the Pre-OJEU Key Stage Review.

7.6 The Pre-OJEU KSR was completed on 4 December 2012. It confirmed that 'The draft OJEU, PQQ and Information Memorandum have been completed, subject to final points checking and have been reviewed by the Board's advisers and SFT's comments have also been taken into account.' The OJEU Notice was published on 5 December 2012.

7.7 The Memorandum of Information (IM) provided information about: the procuring authority; the project and opportunity; the site and work to date; the project management arrangements; the completion and submission of PQQ responses; conditions for participation; and the pre-qualification evaluation process. Annex 1 contained the Pre-Qualification Questionnaire.

7.8 The IM explained that the PQQ evaluation would comprise the following stages:

> all PQQ submissions submitted in accordance with the PQQ submission requirements…will firstly be checked by the Board for compliance and completeness. Non-compliant and/or incomplete PQQ submissions may be rejected by the Board
>
> the Board will then carry out a preliminary assessment of each remaining PQQ submission to evaluate the 'Pass/Fail' questions. If a Candidate is assessed as failing any such question their PQQ submission will be rejected by the Board. Candidates should note that the preliminary assessment will include an assessment of each remaining Candidate's financial standing submission(s) and any Candidate's PQQ submission assessed as failing the financial standing evaluation will be rejected by the Board.
>
> the Board will then carry out a detailed assessment of each remaining PQQ submissions to evaluate the scored questions. During the detailed assessment the Board will calculate a score for each remaining PQQ submissions using the section weightings and question sub-weightings shown in the evaluation table at paragraph 8.6…
>
> …The scored questions identified in the evaluation table at paragraph 8.6 will be scored using the scoring system described at paragraph 8.4."

7.9 Paragraph 8.4 of the IM stated: "Evaluation guidance is provided in the PQQ for each question that will be scored. Unless otherwise indicated, responses to each question will be scored out of 10 and based on the degree to which the response covers the range of factors specified in the relevant evaluation guidance and as appropriate/relevant to the question, depth of understanding of the issues and/or quality of examples and experience".

7.10 The evaluation table at paragraph 8.6 of the IM included the following details:

Section	Subject	Status	Question Sub Weighting	Section Weighting
A	The Candidate			30%
	General Information	Not scored		
	Resourcing	Scored	30%	
	Capacity	Scored	10%	
	Working Together	Scored	30%	
	Conflicts	Pass/Fail		
	Raising Finance	Scored	30%	
	Financial capacity & economic standing	Pass/Fail		
		Sub-weighting Total	100	
	Construction Contractor: minimum turnover	Pass/Fail		
	Construction Contractor: minimum financial standing	Pass/Fail		
	Subordinated Debt Providers: minimum financial standing	Pass/Fail		
	CDM ACoP	Pass/Fail		

Section	Subject	Status	Question Sub Weighting	Section Weighting
B	Construction Contractor			30%
	General information	Not scored		
	Healthcare experience PPP	Scored	40%	
	Healthcare experience non-PPP	Scored	20%	
	Experience operational site	Scored	15%	
	Other experience	Scored	10%	
	Claims	Scored	5%	
	References	Not scored separately		
	Quality	Pass/Fail		
	Health & Safety	Pass/Fail		
	Environmental	Pass/Fail		
	Employment	Pass/Fail		
	Employment	Scored	5%	
	Employment	Scored	5%	
	Employment	Pass/Fail		

Section	Subject	Status	Question Sub Weighting	Section Weighting
		Sub-weighting Total	100	

Section	Subject	Status	Question Sub Weighting	Section Weighting
C	FM Service Provider			30%
	General information	Not scored		
	Healthcare experience PPP	Scored	45%	
	Healthcare experience non-PPP	Scored	25%	
	Other experience	Scored	15%	
	Claims	Scored	5%	
	References	Not scored separately		
	Quality	Pass/Fail		
	Health & Safety	Pass/Fail		
	Environmental	Pass/Fail		
	Employment	Pass/Fail		
	Employment	Scored	5%	
	Employment	Scored	5%	
	Employment	Pass/Fail		
		Sub-weighting Total	100	

Section	Subject	Status	Question Sub Weighting	Section Weighting
D	Designated Organisations*			30%
	General information	Not scored		
	Healthcare experience PPP	Scored	40%	
	Other PPP experience	Scored	20%	
	Healthcare experience non-PPP	Scored	25%	
	Other experience	Scored	15%	
	References	Not scored separately		
		Sub-weighting Total	100	
E	PQQ declaration	Not scored		
F	Statement of Good Standing	Not scored		

			Weighting Total	100%

7.10.1 "* Each designated organisation will be scored separately with sub-weighting split evenly across them."

7.11 The IM also stated, at paragraph 8.5, that: "Following the detailed assessment stage, the Board shall rank the remaining Candidates in numerical order against their cumulative score. A short list of Candidates to be invited to participate in the dialogue stage shall be drawn up. The Board only intends to select three Candidates for inclusion on its short-list. The three short-listed by the Board shall be those achieving the highest scores during detailed assessment."

7.12 Three candidates submitted a PQQ response: B3 (also referred to as 'Candidate A', later 'Bidder A'); Integrated Health Solutions Lothian (also referred to as 'Candidate B', later 'Bidder B' or 'IHSL'); and (c) Mosaic (also referred to as 'Candidate C', later 'Bidder C').

7.13 Evaluation of PQQ responses and the preparation of the PQQ shortlist took place from 21 January 2013 to 8 March 2013.

7.14 The PQQ Core Evaluation Team included: Brian Currie (NHSL Project Director), Carol Potter (NHSL Associate Director of Finance), Iain Graham (NHSL Director of Capital Planning & Projects) Jackie Sansbury (NHSL Chief Operating Officer), Janice Mackenzie (NHSL Clinical Director), Richard Cantlay (MM Technical Advisor), Michael Pryor (Financial Advisor with Ernst & Young) and Andrew Orr (Legal Advisor with MacRoberts).

7.15 The Core Evaluation Team received Evaluation Support, including technical advice on design, construction and facilities and management. The lead on design and construction was Andrew Scott (MM) and on Facilities Management was Simon McLaughlin (Davis Langdon). The Evaluation Support team also received additional specialist support. Specialist support on NHSL Infection Control was provided by Fiona Cameron, head of NHS Lothian Infection Prevention & Control Services.

7.16 At the PSB meeting on 25 January 2013, Peter Reekie (Director of Finance and Structures, SFT) requested that NHSL consider accelerating the evaluation of PQQ due to the relatively low number of returns received. Brian Currie responded:

> ‘due and proper process is upper most in the evaluation team’s mind and that a detailed programme of evaluation activities has been agreed which may prove difficult to re organise at short notice. However, the intention is to make final recommendation to next P St Bd on the 22nd of February, some 7 business days ahead of current programme A subsequent extraordinary F+R Meeting may be required to be called to authorise progression to dialogue – SG to advise. 11th March commencement of dialogue remains target."

7.17 Brian Currie gave the outcome of the PQQ evaluation process in a paper presented to the PSB held on 22 February 2013. Mosaic scored 75 out of 100, B3 scored 74, and IHSL scored 72. The PSB unanimously approved the recommendation that all three candidates be invited to participate in dialogue.

7.18 IHSL’s scores for ‘Candidate’ and ‘Designated Organisations’ pulled their overall score down. The ‘Candidate’ refers to the bidding consortium, while ‘Designated Organisations’ include sub-contractors identified by the bidding consortium to provide particular services. Other parties assessed in the PQQ are the Construction Contractor and FM Contractor. For IHSL’s bid, the ‘Candidate’ was IHSL, the ‘Construction Contractor’ was Multiplex, the ‘FM Contractor’ was ETDE, FM and ‘Designated Organisations’ included HLMAD, Wallace Whittle and Robert Bird.

7.19 In the PQQ candidate feedback for IHSL it was noted that “that Wallace Whittle have no health PPP experience.” NHSL has advised the Inquiry Team that although Wallace Whittle may not have previously worked on a health PPP project, they had both health and PPP experience separately. MM have advised the Inquiry Team that Wallace Whittle having no health PPP experience was flagged as something to be aware of, but it would not prevent a client moving forward with that consortium. The evaluation process looks at

all parts of a consortium team. MM informed the Inquiry Team that in it's experience, it is unrealistic to expect that there would ever be a perfect consortium. A lack of PPP experience cannot lead to a "fail" and instead the bidder will be scored with fewer marks.

8. Bidders Day

8.1 A bidders day was organised for 13 December 2012. Susan Goldsmith, Director of Finance (NHSL) gave an overview of the project, Peter Reekie, Director of Finance (SFT), gave insight into the wider NPD pipeline and Brian Currie, Project Director (NHSL), gave detail on the project, the reference design and the procurement process.

8.2 The speakers notes for the bidders day contain the following information relating to design documentation:

> "To clarify what we really mean by a Reference Design:
>
> What were the attractions given the departure from previous PPP/PFI projects where an "exemplar" design was the norm?:
>
> - assists with the OBC and accuracy of pre-procurement costing.
> - provides greater certainty over the final design solution.
> - assists significantly in defining a quality threshold.
> - optimises the input required from stakeholders and in particular clinicians and clinical management teams.
> - utilises programme time available as a result of essential parallel activities prior to commencement of procurement.
> - reduces risk and bidding costs to bidders, we would contend.
> - shortens the competitive dialogue phase.
>
> …
>
> Mandatory Requirements Comprises the information that defines Operational Functionality* and is indicated in:
>
> - Interdepartmental Layouts (1:500)

- Departmental Layouts (1:200)
- Room Layouts (1:50) for Key and Generic Rooms Compulsory Requirements
- Planning in Principle as granted by The City of Edinburgh Council.
- Interface, access/egress and infrastructure provisions enshrined in (SA6 + SA Enabling)
- Clinical, D+C and FM Output Specs.

The Reference Design drawings are a diagram or graphical representation of these requirements.

*We refer to Operational Functionality as opposed to Clinical Functionality since some of the mandatory areas of the Reference Design will cover non-clinical functions such as Supplies, Storage, Distribution and Waste Management (Soft FM) and ICT Requirements).

Operational Functionality means:

- The point of access to and within the development, buildings and departments.
- The adjacencies between different departments.
- The adjacencies between rooms within the departments.
- The quantity, description and areas of those rooms and spaces shown on the Schedule of Accommodation.

The level of design development can be described as approximating to RIBA Plan of Work Stage C + (Concept Design) and covers 52% of all spaces at 1:50 scale including the key and generic rooms.

Bidders will be required to generate up to 10 other room types at 1:50 scale for final tender with the remainder being concluded before Financial Close.

Room Data Sheets

Standard format Room Data Sheets have not been prepared by the Board for the Project instead specific room requirements are detailed in a combination of the following documents:

- General Requirements
- Clinical Output Spec
- Environmental Matrix
- Schedule of Operational/Design Notes
- Equipment Schedule
- Schedule of Accommodation
- Operational Functionality elements of the Reference Design

Note: Bidders will be required to develop Room Data Sheets as part of their proposals. The full set of RDS will be completed from appointment of Preferred Bidder to Financial Close.

Schedule of Accommodation

The Schedule of Accommodation, based on the Reference Design drawn layouts, along with the Target or Model (Minimum) Schedule of Accommodation will be issued to Bidders.

This 'Drawn' Schedule of Accommodation for Plant Rooms and Hard FM Rooms is indicative only and should certain other rooms vary in area terms from the Model Schedule this is acceptable on a specific room only basis.

Indicative Requirements

Bidders will be encouraged to propose innovative solutions in response to:

- Information that has been developed to verify the feasibility of the Reference Design in terms of architecture and engineering.
- Information developed for issue to Bidders in regard to site and servicing information. Bidders must however refer to the Board's Construction Requirements for the detailed requirements for all such

indicative elements of the Reference Design for which they may ultimately carry the risk.

Note: The Board's Construction Requirements will always take precedence over the Reference Design for matters which do not define Operational Functionality."

9. The Invitation to Participate in Dialogue (ITPD)

9.1 The ITPD sets out the contracting authority's requirements and the information needed by bidders to prepare their tenders. According to the SCIM:

> "A well drafted and comprehensive ITPD is vital to the smooth running of a project. It will help the participants produce accurate proposals and will avoid misunderstandings that can lead to later problems."

9.2 The SCIM recommends that the ITPD should follow a 'standard form' and include:

- Volume 1: Instructions to Participants (include schedule of deliverables, weightings and contact details)
- Volume 2: Standard Form Project Agreement including project specific amendments
- Volume 3: Technical Specification for Construction Works
- Volume 3 Annex A: Clinical Output Specifications
- Volume 3 Annex B: Non-clinical Output Specification
- Other standard documents will form further appendices

9.3 The ITPD issued for the RHCYP/DCN project is comprised of four volumes:

9.3.1 Volume 1: This set out the general requirements of NHSL in relation to the Project, including:

i. Background information on the Project;

ii. the arrangements for competitive dialogue;
iii. use of the Reference Design including mandatory and indicative elements and the concept of Operational Functionality;
iv. the informal submissions bidder should provide;
v. the Draft Final Tender requirements and the envisaged Final Tender requirements;
vi. evaluation requirements and the evaluation weighting criteria; and
vii. Appendix A(ii) – Submission Requirements.

9.3.2 Volume 2: This set out the contractual requirements of NHSL in relation to the Project in a 'NPD Project Agreement' and 'NPD Articles of Association'.

9.3.3 Volume 3: known as the 'Board Construction Requirements' sets out the specific technical requirements of NHSL in relation to the Project, these being the construction (clinical and non-clinical) requirements, equipment requirements and facilities management requirements:

i. Appendix A included 'interface with Campus Site and/or Campus Facilities.
ii. Appendix B included the Interface Output Specification.
iii. Appendix C included the draft Environmental Matrix.

9.3.4 Volume 4: This sets out the Data Room available to bidders, which was used for sharing information.

9.4 The following section of this paper provides extracts from the ITPD that relate to

- NHSL's requirements for mechanical and electrical engineering, specifically with regard to the ventilation system;
- the design documents in which ventilation requirements are captured and which bidders were expected to produce; and
- the status of the information contained in or with the ITPD.

9.5 The ITPD was revised during Competitive Dialogue to reflect changes to NHSL's requirements.

9.6 Volume 1

9.6.1 An 'Important Notice' at the beginning of Volume 1 of the ITPD states:

> "Any summaries or descriptions of documents or contractual arrangements contained in any part of the Invitation cannot be and are not intended to be comprehensive, nor any substitute for the underlying documentation (whether existing or to be concluded in the future) and are in all respects qualified in their entirety by reference to them."

9.6.2 Section 2 of Volume 1: 'Technical Overview' provides an overview of the technical requirements of the Project. Section 2.4.1 provides an overview of the design and construction elements and states:

> "The specific requirements for the Facilities to be provided are set out in the Board's Construction Requirements. This comprises: -
>
> - General Requirements;
> - Specific Clinical Requirements; and
> - Specific Non-Clinical Requirements.
>
> The Board's Construction Requirements are set out in Section 3 of Volume 3 of the ITPD and will ultimately form Section 3 of Schedule Part 6 (Board's Construction Requirements) of the NPD Project Agreement...
>
> …. it should be noted that certain elements of the design as they relate to aspects of Operational Functionality are mandatory, as described below and in Appendix E (Reference Design Elements) of Volume 1 of the ITPD."

9.6.3 Section 2.5 sets out the 'Reference Design and Mandatory Reference Design Requirements' (this is addressed in detail in the Inquiry's PPP on the Reference Design). The sub-sections describe design documents that bidders were required to develop as part of their bids and, if successful, during the

preferred bidder stage. It also explains which elements of these design documents had already been developed as part of the reference design. Section 2.5 addressed a number of issues including:

2.5.1 Schedule of Accommodation and Reference Design Schedule of Accommodation

2.5.2 Room Layouts

2.5.3 Room Data Sheets.

9.6.4 Section 2.5 does not explicitly address requirements relating to building services engineering solutions, mechanical and electrical engineering or ventilation more specifically. However, section 2.5.3 does contain information on room data sheet production.

9.6.5 Section 2.5.3 sets out the requirements for the production of Room Data Sheets and mentions the Environmental Matrix as a source of 'room information' to be used to compile room data sheets:

"Standard format Room Data Sheets have not been prepared by the Board for the Project. The specific room requirements (the 'Room Information') are detailed in a combination of the following documents:

- The Board's Construction Requirements;
- The Environmental Matrix;
- The Schedule of Operational/Design Notes;
- The Equipment Schedule;
- The Equipment Responsibility Matrix;
- The Draft Schedule of Accommodation; and
- The Operational Functionality elements of the Reference Design.

During Dialogue Bidders will be required to develop Room Data Sheets, incorporating the Room Information, for those rooms for which 1:50 layout

drawings have been prepared. For the avoidance of doubt this shall include all Key Rooms and Generic Rooms in addition to those rooms identified in the table at paragraph 2.5.2 above. The Room Data Sheets will form part of the Bidders proposals. The Preferred Bidder will be required to complete Room Data Sheets for all remaining rooms prior to Financial Close."

9.6.6 Section 2.6 of the ITPD Volume 1 addresses 'Indicative Elements of the Reference Design':

"During the preparation of the Mandatory Reference Design Requirements, other information has been generated both as a by-product of preparing the Reference Design itself and as a general Project requirement as follows:

- FM goods handling and distribution;
- Structural engineering solutions;
- Building services engineering solutions;
- Servicing strategies and space allocations; and
- Hard FM solutions and space allocations.

This constitutes the 'Indicative Elements of the Reference Design'.

Such information is issued to the Bidders for "information only" so that they may understand the intent of the Reference Design. Bidders must however refer to the Board's Construction Requirements for the detailed requirements for all such Indicative Elements of the Reference Design for which they will ultimately carry the risk. Bidders are advised that the Board's Construction Requirements will always take precedence over the Reference Design for matters which do not define Operational Functionality. The full distinction between Mandatory Reference Design Requirements and Indicative Elements of the Reference Design are set out in Appendix E (Reference Design Elements)."

9.6.7 Mechanical and Electrical/Building Services Engineering solutions is not included in Appendix E as a mandatory element of the reference design. The Environmental Matrix, which contains specifications for the ventilation system amongst other things, is also not included. However, the Environmental Matrix is referred to in the Board's Construction Requirements.

9.6.8 Section 2.8 of the ITPD volume 1 addresses Building Research Establishment Environment Assessment (BREEAM):

> "Bidder's designs must achieve, as minimum, a 'Very Good' BREEAM rating in line with the requirements for healthcare facilities as set out in the BREEAM Scheme Document for New Construction (SD5073) 2011. The designs must also achieve a minimum of 6 credits ("Excellent" rating) in accordance with the BREEAM Scheme Document for New Construction (SD5073) Section 6.0 ENE1."

9.6.9 Section 2.9 of the ITPD Volume 1 addresses Sustainable Design and Quality:

> "Bidders are required to promote sustainable development by demonstrating an integrated approach to the social, environmental and economic well-being of the area served, now and for future generations. The Facilities will reflect the objectives of any local agenda strategy supported by the CEC and also satisfy the requirements of all health and social care guidance notes, as set out in Board's Construction Requirements associated with sustainability and environmental performance."

9.6.10 Information relating specifically to ventilation requirements is set out in 'Appendix A (ii) – Submission Requirements', under section C (Approach to Design and Construction). Appendix A states that "The technical submission requirements submitted by the Bidders in response to section C (Approach to Design and Construction) below will ultimately form part of Project Co's Proposals in accordance with the NPD Project Agreement." Relevant sections are reproduced in the table below.

Table: Summary of submission requirements relating to ventilation in Appendix A (ii) – Submission Requirements, ITPD Volume 1.

Quality Evaluation Criteria & Reference	**Quality Evaluation Basis**	**Quality Evaluation Criteria Weighting**	**Submission Requirement reference and submission requirement**
C8. Clarity, robustness and quality of M&E engineering design proposals	Scored	1.06	C8.2 Bidders must submit proposals setting out how their design will be developed to include the following: … iii. How temperature, ventilation and comfort for occupants will be maintained in accordance with the minimum criteria and how, if possible, these criteria will be improved; iv. How the quality of the environment and prevention of sick building syndrome shall be ensured; vi. How sustainability has been incorporated into their design, including details of the maintenance and operation philosophy for all mechanical and electrical equipment; The following information should be also be provided to help demonstrate the design proposals noted above, including: x. An environmental conditions / room provisions matrix for both mechanical and electrical services for each room in the Facilities; …

Quality Evaluation Criteria & Reference	Quality Evaluation Basis	Quality Evaluation Criteria Weighting	Submission Requirement reference and submission requirement
			C8.3 Whilst Bidders are required to undertake their own design, the Board has provided a draft Environmental Matrix as part of the ITPD documentation. Bidders must confirm acceptance of the Board's Environmental Matrix, highlighting any proposed changes on an exception basis.
C10. Clarity, robustness and quality of energy management proposals	Scored	1.85	C10.1 Bidders must submit proposals setting out their approach to energy management. This should be provided as set out in C10.1 and C10.2 below. Bidders must submit an energy model, complete with supporting information, demonstrating how their design solution will achieve an optimum level of energy and utility conservation (linked with the requirement for a sustainable development in C4) and show that their design fulfils the following: … iv. The inclusion of passive design strategies for ventilation and thermal control. The environmental control system is to be co-ordinated and integrated with the design of the structure and the occupied areas in order to maximise the control and flexibility of the installations.

Quality Evaluation Criteria & Reference	Quality Evaluation Basis	Quality Evaluation Criteria Weighting	Submission Requirement reference and submission requirement
			In addition Bidders must submit an analysis of their design solution which demonstrates energy consumption proposals along with cost estimates of specific measures or innovations to be introduced C10.2 For information purposes only in addition to the model referred to above a dynamic thermal energy model is to be submitted which should comply with the parameters set out in Appendix F of the ITPD Volume 1.

9.6.11 Appendix A also set out the requirement and scoring approach for C21 'Compliance with Board's Construction Requirements'. This was assessed through a pass or fail mark. The submission requirement was that:

> "Bidders must confirm their compliance with the Board's Construction Requirements. If as their design has been developed there are specific areas of the Board's Construction Requirements that Bidders would seek to change, these shall be scheduled and provided in support of the statement. The Board shall not be required to accept any proposed amendments".

9.6.12 The amendments referred to above were to be summarised in their submission response to C30: 'Acceptable list of summary assumptions, clarifications and derogations.' This was not scored.

9.6.13 According to Appendix A, bidders were "permitted to submit its responses in a format…which they consider most appropriate to best demonstrate an

understanding of the Board's requirements and/or a solution which complies with the Board's requirements. However, as a minimum, the Board would require all design deliverables set out in AP1.1 and AP1.2 to be submitted as part of the Submission Requirements for C (Approach to Design and Construction)".

9.6.14 Appendix AP1.1 contains further design deliverables in respect of ventilation for the RHCYP/DCN:

3. Approach to Design & Construction - Interior Design Proposals

3.2 - Loaded 1:50 room layout drawings for the RHSC indicating interior design proposals and demonstrating the coordinating aspects of all design disciplines, including floors, walls, ceilings, façade ventilation, mechanical and electrical services.

5. Mechanical & Electrical Services

5.7 - 1:200 internal services concept schematic and zoning plans for both heating and ventilation; indicating of heating and ventilation in each room

5.9 - Mechanical schematic layouts and report (co-ordinated and consistent with all drawings and design information contained within the Bid Submission Requirements) denoting details and extent of proposed:

5.9.6 - Natural Ventilation strategy

5.9.7 - Mechanical Ventilation strategy

5.9.10 - Specialist ventilation strategy

5.12 - 1:50 mechanical and electrical services sections to illustrate use of ceilings, natural daylight, ventilation strategies, cooling and heating strategies, lighting strategy, acoustic strategy, specialist installations strategy, services concept

7. Environmental Services and Energy Management Strategy

7.1 - Natural Ventilation drawings and proposals

9.6.15 Appendix F – Thermal and Energy Model Parameters states:

"Project Co shall undertake Dynamic Thermal Energy Modelling to assess the energy performance and thermal performance of Project Co's Proposals.

The thermal performance of the Facilities shall be dynamically thermally modelled to the Project specific parameters, identified within Section 3 (Board's Construction Requirements) of Schedule Part 6 (Construction Matters). Thermal modelling shall inform the sizing of all heating, ventilation and comfort cooling requirements for Project Co's Proposals, inclusive of all natural ventilation pathway and overheating analysis.

In conjunction with energy performance, CO2 emissions shall also be required to be equal to, or better than, the agreed Carbon Emissions requirements in Section 3 (Board's Construction Requirements) of Schedule Part 6 (Construction Matters). The following documentation shall be used in providing the targeted thermal energy modelling requirements for the building;

- Scottish Health Technical Memorandums
- EnCO2de
- Health Building Notes
- CIBSE Design Guides
- Building Regulations (Scotland) Technical Standards"

9.7 Volume 2

9.7.1 Volume 2 of the ITPD is the NPD Project Agreement for the Project. It was based upon SFT's standard form contract.

9.7.2 The NPD Project Agreement included project specific amendments, which had been pre-agreed by the Board of NHSL and SFT. Bidders were encouraged to accept positions within the NPD Project Agreement, which

reflected SFT's standard form project agreement. However, bidders were also encouraged to raise any comments in relation to the project specific amendments by dialogue meeting 3, in order that these issues could be flagged to SFT at that time. Any proposed bidder amendment to the NPD Project Agreement would be a derogation. All derogations required the approval of SFT.

9.7.3 In general, all matters in relation to the NPD Project Agreement were to be raised with NHSL prior to close of dialogue. Only matters in relation to fine tuning and clarification would be permitted post-close of competitive dialogue.

9.7.4 Volume 2 of the ITPD defines 'Board's Construction Requirements' as meaning "the requirements of the Board set out or identified in Section 3 (Board's Construction Requirements) of Schedule Part 6 (Construction Matters) as amended from time to time in accordance with the terms of this Agreement". The Board's Construction Requirements were initially provided to bidders as Volume 3 of the ITPD.

9.7.5 The Project Agreement provided as Volume 2 of the ITPD included Section 5 (Reviewable Design Data) of Schedule Part 6 (Construction Matters) which explains the concept of reviewable design data:

> "This Section 5 (Reviewable Design Data) of Schedule Part 6 (Construction Matters) sets out the details of the specific design information, materials, samples and required approvals (as more specifically set out in the table below) ("Reviewable Design Data") to be reviewed by the Board in accordance with Schedule Part 8 (Review Procedure) before such Reviewable Design Data is incorporated into the Facilities and/or the Site by Project Co.
>
> For the avoidance of doubt, if Project Co's Proposals incorporate Room Data Sheets and/or Reviewable Design Data there shall be no requirement for Project Co's Proposals to be issued to the Board for review under Schedule Part 8 (Review Procedure). However, if Project Co subsequently revises or amends its Project Co's Proposals in relation to the Room Data Sheets and/or Reviewable Design Data, then such

revisals or amendments shall require to be issued to the Board for review under Schedule Part 8 (Review Procedure)."

9.7.6 Section 5 provides a table of Reviewable Design Data. The environmental matrix is not included in the table. However, Room Data Sheets are included. The Inquiry Team understands that this approach was adopted because room data sheets should have been completed for every room in the hospital by financial close. Therefore, the Environmental Matrix should have become obsolete as a briefing and design tool.

9.8 Volume 3

9.8.1 Volume 3 of the ITPD consists of Schedule Part 6 (Construction Matters), Section 3, of the NPD Project Agreement. It set out the Board's Construction Requirements. Sub-Section C set out the General Requirements and Sub-Section D the Specific Clinical Requirements.

9.8.2 Paragraph 2 of Sub-Section C set out the Project Wide Requirements, which included:

2.1 Approach to Design

2.2 General Requirements of the Board

2.3 NHS Requirements

2.4 Minimum Design and Construction Standards

2.5 Hierarchy of Standards

9.8.3 Section 2.1, "Approach to Design" states that:

"The new building will follow the design aspirations and guidance laid out in the Policy on Design Quality for NHS Scotland (2010) to which the Board subscribes and implements through its Design Champion.… The Design Champion for the project is the NHS Lothian's Project Sponsor, supported by the Director of Capital Planning and Projects, and the design process is managed by the reprovision project team."

9.8.4 Section 2.2 ‘General Requirements of the Board’, states that “Project Co shall ensure the Facilities comply with the following general requirements of the Board”. The list of requirements that follow include:

> “Adherence to the requirements set out in CEL 19 (2010) “A Policy for Design Quality for NHSScotland, 2010 Revision published by the Scottish Government.”

9.8.5 CEL 19 (2010) is addressed in detail the Reference Design and Environmental Matrix PPPs. It required NHSScotland bodies to utilise the ADB system for briefing, design and commissioning of new hospitals. If a different tool was to be adopted, the onus was placed on the NHS body to demonstrate that it was of equal value.

9.8.6 Paragraph 2.3 ‘NHS Requirements’:

> “In addition to the standards listed in paragraph 2.4 of this Sub-Section C, unless the Board has expressed elsewhere in the Board's Construction Requirements, a specific and different requirement, the Facilities shall comply with but not be limited to the provisions of the NHS Requirements as the same may be amended from time to time.”

9.8.7 Included in the list of guidance that follows is

> “…
>
> b) New Policy on Design Quality for NHS Scotland published by SGHSCD;
>
> …
>
> h) HTM and SHTM…
>
> …Health Technical Memoranda & Scottish Health Technical Memoranda (HTM & SHTM)

Project Co shall, in relation to all SHTM and all HTM (except HTM where an SHTM exists with the same number and covering the same subject matter): take fully into account the guidance and advice included within such SHTM and HTM; ensure that the Facilities comply with the requirements of such SHTM and HTM; and adopt as mandatory all recommendations and preferred solutions contained in such SHTM and HTM."

9.8.8 Paragraph 2.5 sets out the 'Hierarchy of Standards'. It states that:

"…Where contradictory standards/advice are apparent within the terms of this Section 3 of Schedule Part 6 (Construction Matters) and the Appendices then subject to the foregoing paragraph then (1) the most onerous standard / advice shall take precedence and (2) the most recent standard / advice shall take precedence. When the more onerous requirement is to be used the Board will have the right to decide what constitutes the more onerous requirement.

Where there is a conflict of interest resulting from the use of the standards /advice Project Co shall involve the Board in the decision making process. The Board shall be entitled to make the final decision regarding the standards / advice to be used for the Facilities including any contradictions that may arise between items (1) and (2) above…

…In certain instances, NHS publications include a number of options or alternative solutions. Where the Board has defined their preference specifically, Project Co shall adopt these preferences as a mandatory requirement. Where no Board preference is stated, Project Co shall engage the Board in the design development process to seek and incorporate the Board's preference within the Facilities."

9.8.9 Paragraph 3 sets out the General Design Requirements and includes the following instructions regarding Room Data Sheets.

"Paragraph 3.6.3 Room Data Sheets

Project Co shall provide Facilities that, as a minimum, meet all the requirements specified in the Room Data Sheets included in this Schedule Part 6 Section 6. Room Data Sheets not included in Schedule Part 6 Section 6 shall be provided through RDD.

Project Co shall provide fully developed Room Data Sheets submitted to the Board as Reviewable Design Data for review by the Board in accordance with Schedule Part 8 (Review Procedure) and clause 12.6 of the Project Agreement.

As part of the commissioning process, Project Co shall be responsible for demonstrating compliance with the requirements included within the Room Data Sheets.

For the avoidance of doubt, Project Co shall provide mechanical ventilation, comfort cooling and air conditioning to suit the functional requirements of each of the rooms in the Facilities. Irrespective of the ventilation requirements in Room Data Sheets, where rooms are clearly intended to be occupied and/or become internal spaces during design development and natural ventilation is not possible, mechanical ventilation and/or extract ventilation shall be provided as appropriate to suit the function of the space."

9.8.10 Paragraph 5 set out the General Construction Requirements. Paragraph 5.2 'Infection Prevention & Control' states:

"Project Co shall ensure all aspects of the Facilities allow for the control and management of any outbreak and/or spread of infectious diseases in accordance with the following:

f) Ventilation in Healthcare Premises (SHTM 03-01);"

9.8.11 Paragraph 5.3 ‘Thermal Requirements’ states:

> “Project Co shall ensure the buildings’ envelopes complies with Section 6 of 2011 Non-domestic Technical Handbook to The Building (Scotland) Amendment Regulations 2010 and the following criteria:
>
> c) The building fabric shall include passive design measures to limit summer temperatures to figures given within the Environmental Matrix;”

9.8.12 Paragraph 5.25.1 ‘BREEAM’ states:

> “Project Co shall ensure that the Facilities achieve as a minimum a ‘Very Good’ rating when assessed against BREEAM 2011 New Construction (SD5073). Under the BREEAM 2011 New Construction (SD5073) there are now mandatory requirements specifically under energy, CO2 emissions, water and ecology. In addition, BREEAM embraces energy efficiency and passive design strategies for ventilation and thermal control to enhance internal comfort. The Facilities shall therefore also meet a BREEAM ENE1 target of 6 credits (excellent) in accordance with the BREEAM Scheme Document for New Construction (SD5073) Section 6.ENE1”

9.8.13 Paragraph 5.26 ‘Energy Strategy’ states:

> “Project Co shall provide Facilities that achieve an optimum level of energy and utility conservation. Project Co shall:
>
> a) Minimise internal areas requiring mechanical ventilation;”

9.8.14 Paragraph 8 set out the ‘Mechanical & Electrical Engineering Requirements’:

> “Project Co shall provide the Works to comply with the Environmental Matrix.
>
> Project Co shall in carrying out the Works comply with the following non-exhaustive list of mechanical & electrical requirements.

…

Project Co shall take cognisance of all the building services implications of the requirements described in the Board's Construction Requirements of this Schedule Part 6 Section 3 Sub-Section D (Specific Clinical Requirements) and Sub-Section E (Specific Non-Clinical Requirements).

For the avoidance of doubt the hierarchy of standards and advice detailed in paragraph 2.5 shall apply to this paragraph 8."

9.8.15 Paragraph 8.1 lists the 'Minimum Engineering Standards' including "a non exhaustive list of SHTM's, HBN's and HTM's applicable to the Facilities" which includes:

"…

h) SHTM 03-01: Ventilation in Healthcare Premises;"

9.8.16 Paragraph 8.2 'Infection Control' states:

"Mechanical and Electrical equipment selections and designs shall take cognisance of HAI-SCRIBE in its entirety."

9.8.17 Paragraph 8.5.2 'Thermal Comfort' states:

"Where maximum internal summer time temperature calculations indicate that the internal temperature will exceed those limits set out in the Environmental Matrix, Project Co shall provide means of reducing the temperature rise.

Measures shall be assessed, modelled and implemented to demonstrate that the internal air temperature of any room or area does not exceed the maximum acceptable level of 25°C for more than 50 hours per annum.

For any room or area that does not meet this criterion, there should be a hierarchy of remedial action to prevent the high temperature by passive means as a priority, adopting a suitable means of comfort cooling as a last resort."

9.8.18 Section 8.5.3 ‘Air Quality’ states:

"…

i. Internal

…Particular attention shall be given to the risk of cross infection within the hospital / healthcare environment and shall be such as to minimise the spread of infection. Project Co shall demonstrate through submission of information to the Board as Reviewable Design Data for review by the Board in accordance with Schedule Part 8 (Review Procedure) and clause 12.6 of the Project Agreement, how the proposals facilitate the control and management of an outbreak and spread of infectious diseases, and in particular shall comply with the requirements of SHTM 03-01 (Ventilation in Healthcare Premises). In order to reduce cross-contamination, the design of the Facilities shall incorporate 100% fresh air supply systems only.

Project Co’s demonstration referred to above is to cover all aspects of the building, its services, spatial relationships, soft and hard FM proposals and incorporate requirements of the Board’s Infection Control Team.

Project Co shall provide natural ventilation wherever possible, except where:…

d) Where inflows of air are undesirable;

e) Clinical requirements, as detailed in the Room Data Sheets, do not allow in areas such as isolation rooms, where positive or negative pressure are required; and

f) Areas which are air-conditioned.”

9.8.19 Section 8.7.8 ‘Mechanical Ventilation & Air Conditioning’:

“…The need to maintain comfort conditions in accordance with the Room Data Sheets in all areas but particularly in clinical areas is of paramount

importance and Project Co shall develop strategies for achieving these conditions together with minimum energy consumption.

Project Co shall provide natural and mechanical ventilation, comfort cooling, and air conditioning to suit the Facilities and clinical requirements and provision of the Clinical Services…

…Project Co shall demonstrate how the proposals facilitate the control and management of an outbreak and spread of infectious diseases in accordance with SHTM 03-01, SHFN 30 and HAI-SCRIBE..."

9.8.20 Paragraph 8.7.22, 'Ventilation and Air Conditioning of Isolation Rooms' states:

"Project Co shall provide air conditioning systems to Isolation Rooms to support the Board's Construction Requirements of this Schedule Part 6 Section 3 Sub-Section D (Specific Clinical Requirements), NHS Standard Infection Control Precautions (SICPs) and maintaining strict positive / negative pressure differentials.

Ventilation and air conditioning systems for these rooms shall be designed and installed in accordance with SHTM 03-01, 04-01 and NHS Model Engineering Specification C04. Project Co shall demonstrate how the proposals facilitate the control and management of an outbreak and spread of infectious diseases."

9.8.21 No similar instructions are provided for the Critical Care Department.

9.8.22 Part 6 Section 3: The Boards Construction Requirements, Sub-Section D: Specific Clinical Requirements states:

"This Schedule Part 6 Section 3 Sub-Section D forms the Specific Clinical Requirements included in the Board's Construction Requirements Specification. Project Co shall satisfy all the requirements under this Sub-Section D.

It contains design philosophy and specific requirements for each of the clinical services to be provided from the Facilities."

9.8.23 The clinical requirements for the Critical Care department were set out in the Clinical Output Specification for Critical Care. This states:

- "Flexibility in the use of the Critical Care beds for both High Dependency and Intensive Care is key to maintaining efficient use of high specification beds. All three critical care areas must be co-located
- Single cubicles will be used for privacy or isolating ordinary infectious conditions
- Lobbied single bed isolation cubicles are required for both source and protective isolation of patients and they all require to have identical design of pressure control with positive pressure lobbies with filtered air, and negative extraction cubicles. It is required that Contaminated air must not flow back into any of the open Critical Care areas. It is required that the lobby must be joined to the room at the foot end of the bed.
- All PICU and HDU bed spaces are required to be of the same specification to allow greatest flexibility of use."

9.8.24 Appendix C contained the environmental matrix. This is addressed in detail in a separate PPP.

10. Key Stage Review 2a: Pre-ITPD

10.1 The Pre-ITPD KSR was finalised on 7 March 2013. Question 4 of the KSR under section 2 "Project Requirements" stated:

"Please explain the approach that the Procuring Authority is taking in presenting its design and specification requirements to bidders (e.g., use of exemplar or reference designs) and the opportunities available for bidders to propose alternative or innovative solutions. Please demonstrate that this approach is consistent with (i) allowing opportunity for improved value for money through bidder innovation (ii) allowing scope for value engineering required to deliver the project within the affordability limits (iii)

the procurement timetable and (iv) bidder access to project stakeholders during the procurement."

10.2 The answer provided was:

"The ITPD, Volume 1 section 2.5 and Appendix E sets out the elements of the Reference Design which is being provided to bidders are mandatory. These relate to the Operational Functionality as defined in the Project Agreement and there are elements of flexibility in relation to non-mandatory elements of the Reference Design."

10.3 There was no explanation, or analysis, in the KSR of the purpose of the environmental matrix.

11. Competitive Dialogue

11.1 The ITPD was issued by NHSL to all three bidders on 12 March 2013. This marked the start of Competitive Dialogue.

11.2 Paragraph 5.15 of the SCIM NPD Guide: OJEU to Contract Award states that the aim of Competitive Dialogue:

"is to 'identify and define the means best suited of satisfying [the contracting authority's] needs.' This stage formally acknowledges the need in complex projects to talk around solutions, develop ideas and explore options as part of the tender process…It should therefore continue until the contracting body is satisfied that it has identified the solution or solutions capable of meeting its needs and requirements with sufficient precision to enable Final Tenders (which fully meet these requirements) to be submitted."

11.3 NHSL's Core Evaluation Team were involved in Competitive Dialogue, assisted by technical, legal, financial and cost advisors. NHSL did not have an external healthcare planner to advise them during the Competitive Dialogue process.

11.4 The Reference Design Team who had produced the reference design and associated documents were not retained by NHSL during the procurement period to allow members to join bidding teams during the procurement stage. According to the August 2012 version of MM's "Approach to Reference Design" paper:

> "The Reference Design will therefore have to be handed over to the Technical Advisory team and actions will have to be taken to cover for the fact that the Reference Design team will not be available to address queries during the procurement process.
>
> In terms of the handover and sign-off of the Reference Design, the following matters will have to be addressed:
>
> - Is the Reference Design fully aligned with the requirements of the Clinical Output specifications;
> - Has NHSL taken ownership of the Reference Design on the basis that some areas of the design will be a compromise between the requirements and what can be achieved through design;
> - Is the Reference Design fully aligned with the Board's Construction Requirements – architectural, engineering and Soft FM requirements;
> - The Technical Advisory team during procurement must be in a position to fully understand the development of the Reference Design from a technical point of view. The Team will need to take ownership of the design as if it was its own work."

11.5 In November 2012, the PSB agreed to adopt a compressed programme for competitive dialogue. The competitive dialogue period was reduced from 209 days to 155 days.

11.6 The ITPD sets out the process for Competitive Dialogue in paragraph 4. It was envisaged that the dialogue process would comprise a series of meetings leading to submission of the Final Tender, and that dialogue would be

continued until NHSL was satisfied that solutions from one or more Bidders were capable of meeting NHSL's requirements. Bidders were expected to provide informal submissions in advance of dialogue meetings, and a draft final tender before being invited to submit final tenders at the Close of Dialogue.

11.7 Informal submissions would not be evaluated but feedback on these submissions would be given to Bidders at each stage of the Dialogue and would inform the basis for the remaining Dialogue. The ITPD noted that objective of Dialogue "…is to ensure Bidders are clear on the Board's requirements and allow each Bidder to develop a Solution that is capable of meeting the requirements set out in the ITPD."

11.8 The ITPD provided the following timetable of dialogue meetings.

Activity	Week	Bidder A	Bidder B	Bidder C
Dialogue Opens				
Issue ITPD	0	12/03/13		
Briefing Meeting \ Q and A Sessions	1	Tue 19/03/13	Wed 20/03/13	Thu 21/03/13
Informal Submission 1	2	Mon 25/03/13	Tue 26/03/13	Wed 27/03/13
Dialogue Meeting 1	3	Tue 02/04/13	Wed 03/04/13	Thu 04/04/13
Informal Submission 2	6	Mon 22/04/13	Tue 23/04/13	Wed 24/04/13
Dialogue Meeting 2	7	Tue 30/04/13	Wed 01/05/13	Thu 02/05/13
Informal Submission 3	10	Mon 20/05/13	Tue 21/05/13	Wed 22/05/13
Dialogue Meeting 3	11	Tue 28/05/13	Wed 29/05/13	Thu 30/05/13
Informal Submission 4	14	Mon 17/06/13	Tue 18/06/13	Wed 19/06/13
Dialogue Meeting 4	15	Tue 25/06/13	Wed 26/06/13	Thu 27/06/13
Informal Submission	18	Mon 15/07/13	Tue 16/07/13	Wed 17/07/13
Dialogue Meeting 5	19	Tue 23/07/13	Wed 24/07/13	Thu 25/07/13
Draft Final Tender Submission	24	26/08/13		
Dialogue Meeting 6	28	Tue 24/09/13	Wed 25/09/13	Thu 26/09/13
Dialogue Closes				
Invitation to Submit for Final Tenders	30	11/10/13		
Submission of Final Tenders	35	11/11/13		

11.9 The expected format and requirements for these meetings were set out in the ITPD as follows:

“4.2.2 Each monthly Dialogue Meeting (Dialogue Meetings 1-6) shall involve the Board spending time with each Bidder. The format of such monthly meetings shall be:

(a) Initial meeting between the Board's full Core Evaluation Team and Bidder's team;

(b) The initial meeting shall (if required) break out into a series of sub-meetings concentrating on legal, technical and financial aspects of Bidder's proposals;

(c) The sub-meetings shall re-convene for a final wrap up meeting with the Board's full Core Evaluation Team and Bidder's team.

4.2.3 In advance of each Dialogue Meeting, Bidders are invited to submit specific material related to the agenda topics to be discussed (Informal Submissions) as more fully set out in paragraph 4.5.3. These Informal Submissions by Bidders prior to the Dialogue Meetings shall enable the Board and its advisers to:

(a) review the work undertaken by Bidders since the previous Dialogue Meeting;

(b) provide any meaningful and relevant comments to the Bidders; and

(c) avoid any time disconnect between the Board’s comments and the development of Bidders’ Solutions

4.5.3 The proposed agenda topics and submission requirements for each Dialogue Meeting are set out in the following appendices to Volume 1 of the ITPD:

(a) Appendix A (i) (Technical Agenda Topics and Informal Submission Requirements) and (ii) (Submission Requirements);

(b) Appendix B (i) (Financial Agenda Topics and Submission Requirements); and

(c) Appendix C (i) (Legal Agenda Topics) and (ii) Submission Requirements and Evaluation).

4.5.4 With each technical submission, Bidders are also required to provide a completed Annex 2 to Appendix A (ii) – 'Schedule of Design Deliverables for Technical Meetings during Dialogue Period' confirming the supporting drawings and information that Bidders are providing to support the Submission Requirements of the ITPD. Bidders should note that all drawings must be submitted at least once before submission of the Draft Final Tender."

11.10 An initial briefing meeting was held with all the bidders to introduce the team and provide an overview of the project, including 'in particular the detail and importance of the Reference Design and the demarcation between Mandatory Reference Design Requirements and Indicative Elements of the Reference Design."

11.11 The initial briefing meeting with bidder B (IHSL) was held on 20 March 2013. It was attended by Susan Goldsmith, Project Sponsor, the NHSL Core Evaluation Team and Advisers, and 15 members of the bid team.

11.12 On 8 April 2013 NHSL issued an update to prospective tenderers entitled "Reference Design - an update on requirements for Operational Functionality". According to this update, "the Board have agreed to relax the requirements in relation to a limited number of departments whose location within the RHSC and DCN is less critical." This did not relate to Critical Care or neutropenic patient wards. The ITPD was revised to reflect these changes.

11.13 On 22 April 2013, IHSL submitted its informal submission for Dialogue meeting 2 which addressed C8, 'M&E engineering design proposals', C9 'Lighting' and C10 "Energy Management Proposals". The submission contains the following statements:

"At this stage we have reviewed the Reference Design and Plant and Services Strategies of the Exemplar Design…we think it is fair to say that

the Reference Design appears to ourselves to provide economic, practical and energy efficient solutions and we don't expect the final solutions to be dramatically different.

'Design Control and Operational Philosophy:

The designs will be undertaken in house utilising computer based modelling, calculation and drawing packages... These outline designs will be subject to ongoing review for compliance with SHTM's, HTM's etc and sustainability and BREEAM targets.'

'Sustainability:

Designs will be fully compliant with current legislation and NHS Targets the aim being to meet and exceed where possible.

We are currently holding separate BREEAM and Sustainability reviews with the Team and will advise on progress…

…We are therefore looking closely at materials and passive measures to reduce energy base loads as a parallel exercise with the Architects.'

'C8.3 Environmental Matrix:

No changes proposed at this time nor envisaged in the future but we will continue to review and advise back'

'C10. 1 Energy Management, iv. Passive Design Measures:

Natural ventilation being developed in line with Reference Design and viewed as achievable further thermal performance of building being reviewed with Thermodynamic Model. Will form part of Final Solution with detailed Thermal and Energy Performance Data taken from Thermodynamic Modelling exercise.'"

11.14 Dialogue meeting 2 for bidder B (IHSL) took place on 1 May 2013. Colin Macrae from MM led on responses regarding M&E within the Design and Construction Breakout group.

11.15 The action notes from the meeting do not reflect any detailed discussion regarding ventilation strategy, for example for passive design (using natural ventilation where possible), or consideration of the environmental matrix. Compliance was discussed, with the following action note recorded:

> 2.1.4 Where the Operational Functionality is compromised by virtue of compliance with the Board's requirements as set out in paragraph 5.2.2 of ITPD volume 1 then IHSL shall identify the specific areas affected and provide a supporting commentary. Any such changes will require discussion with an agreement by the Board. NHSL will issue a clarification to all Bidders.
>
> NHSL are still reviewing our position on compliance (in respect of your informal submission 2 D&C proposals) and will issue a bulletin in the week commencing 06/05/13.

11.16 Another Bidder, 'Bidder C' (Mosaic) provided a narrative to explain their ventilation strategy which would 'result in a lower air flow than the 6 air changes/hour specified in SHTM 03 where mechanical ventilation is utilised'. Bidder C also described instances where they would move away from the reference design (environmental matrix), including 'where it is non-compliant with relevant design guidance'. Their submission on C8 and C10, for Dialogue Meeting 2, dated 24 April 2013, contained the following statement:

> "Only move away from the Reference Design where we see real benefit to NHS Lothian in terms of: reduced energy usage; better system resiliency; ease of operation; improved maintenance; or where it is non-compliant with relevant design guidance
>
> …
>
> Natural ventilation facility to be provided where possible to allow a low energy solution within a sustainable design…
>
> …Ventilation can be provided by natural infiltration of outside air via opening windows or other openings or mechanical i.e. fan assisted ventilation. Both natural and mechanical ventilation are appropriate in

particular circumstances however where a specific clinical need applies mechanical ventilation will be provided in accordance with SHTM guidance.

…

The selection of 25°C as the maximum temperature for bedrooms determines that mechanical ventilation and cooling will be the likely solution as simulations have shown that this level of temperature control is not achievable using natural ventilation.

Having established the need for mechanical control of room temperature the ventilation & cooling strategy must be defined…

…The use of terminal cooling devices such as chilled beams are widely accepted as an effective, energy efficient method of cooling which is acceptable in patient bedrooms. In order to maximise energy efficiency the air flow rate should be based on the calculated flow to suit occupancy and provide the required cooling. This will generally result in a lower air flow than the 6 air changes/hour specified in SHTM 03 where mechanical ventilation is utilised.

We would like to explore the acceptability of the above strategy with the Health Board and also review the specialist ventilation strategy for clinical areas such as:

1. Operating theatres

    a. Generally as SHTM

    b. The use of “skirt-less” canopies in UCV theatres

    c. The use of single plant for a pair of theatres

2. Isolation rooms

    a. A common supply system is proposed in the reference design with design as HBN4 supplement 1

b. Application of isolation room guidance to Critical Care single rooms

3 Imaging rooms, in particular;

a. Intra operative MR scanner suite

b. Interventional imaging”

11.17 Bidder C’s informal submission also included a presentation for Dialogue Meeting 2. The following points were made regarding building services and energy:

“• Aim for minimum fresh air, rather than 6 air changes/hour for in-patient bedrooms

• Include for natural ventilation wherever possible

• Utilise Mechanical vent with chilled beams

• treat critical and non-critical spaces differently"

11.18 Feedback notes regarding Bidder C’s submission on M&E, prepared for Dialogue Meeting 2, include:

“Any suggestions/proposals will be considered if they help achieve sustainability target.

Clarify our attitude to reference design.”

11.19 Dialogue meeting 2 for Bidder C took place on 2 May 2013. The action notes do not reflect detailed discussion regarding the ventilation strategy. However, revised action notes included within Bidder C’s informal submission for Dialogue Meeting 3 included the following addition in track changes, “[bidder C was] proposing a reduction from 6AC/Hr to 4 AC/hr as set out in the reference design.”

11.20 On 9 May 2013 NHSL issued a bulletin to all bidders offering clarification of operational functionality. This bulletin states:

> "The Board will consider, and may accept, changes to the Mandatory Reference Design Requirements (i.e. those elements relating to Operational Functionality) where a Bidder considers that those Mandatory Reference Design Requirements are not capable of meeting the Board's requirements (as described in paragraph 5.2.2 of Volume 1 of the ITPD)."

11.21 The bulletin also provides a reminder of the definition of operational functionality set out in the ITPD. (See the previous section of this paper on the content of the ITPD).

11.22 At the meeting of the PSB on 31 May 2013, Brian Currie (NHSL) noted that the Core Evaluation Team were comfortable that all bidders would proceed to submit draft final tenders in late August, but that bidders had fed back that the programme was challenging to meet. Brian Currie also noted that bidders were "only now submitting 1:200 departmental layouts…for which Bidders were expected to provide a robust rationale for any changes to the Reference Design." This related to changes in adjacencies and layouts.

11.23 IHSL provided an update on M&E engineering design proposals, for Dialogue Meeting 3, on 29 May 2013. With regard to 'C8.3 Environmental Matrix' IHSL stated:

> "No changes proposed at this time nor envisaged in the future but we will continue to review and advise back (as previous).
>
> Additional floor plans layouts developed to demonstrate Heating/Cooling/ Ventilation Strategies."

11.24 The floor plan layouts for ventilation strategy were high level and showed that a number of rooms in Critical Care were 'HBN4 dependent', some would receive central air supply and some central supply and extract. Exact air

change rates, pressure regimes and descriptions of the room function were not provided.

11.25 The update on 'C10 Energy Management' included an update on progress with Environmental Modelling:

> "Experiences from the adjacent ERI prove ward conditions are not acceptable when reliant on natural ventilation alone – maximum allowable internal temperature 25ºC.
>
> Single Bedroom Ward, South Facing Exposed (Summer)
>
> Mixed Mode Ventilation
>
> - Opening windows – restricted opening to 100mm.
> - Supply air provided if the room air temperature is great than 25oC.
> - External air 4 ACH cooled to 18ºC.
> - No reliance on uncontrolled infiltration for cooling."

11.26 The Action Notes from Dialogue meeting 3 record that:

> "IHS Lothian provided an update on their Environmental Matrix and Energy Model. Further details to be provided for the next dialogue meeting."

11.27 The Action notes for Bidder C's Dialogue meeting 3, held of 30 May 2013, do not record any discussion of ventilation strategy or the environmental matrix.

11.28 IHSL's Dialogue meeting 4 took place on 26 June 2013. In their informal submission for this meeting no mention is made of ventilation strategy or the environmental matrix. In their update on design development, IHSL referred to the use of ADB with regard to agreeing equipment proposals and signing off room layouts. Their submission arrived after the deadline and it was noted in

the notes for the Chair for Dialogue meeting 4 that “NHSL will respond to these submissions today, but you should be aware that late submissions cannot receive the same attention as those of other bidders that arrive on time.”

11.29 The Action notes for Dialogue meeting 4 with Bidder B (IHSL) do not show any discussion of ventilation strategy, the environmental matrix or use of ADB. There was discussion regarding instances where NHSL’s requirements cannot be delivered as a result of a specific Mandatory Reference Design Requirement:

> “IHS Lothian to provide the schedule in word format which identifies the department, room, perceived non compliance in the Reference Design, proposed solution and the requirement with which it now complies and with the following additional columns – a ‘comments’ column and a ‘yes/ no’ column in order that NHSL can add commentary.”

11.30 IHSL submitted a document titled ‘Compliance with Mandatory Reference Design – B1’, dated 27 June 2013. This document shows differences between the Reference Design and IHSL’s design of the Critical Care (PICU/HDU) department. Under the sub-heading ‘variances’ it is noted that “The non-compliances with the requirements of the operational policy are the same as the reference design.” The summary of IHSL’s “proposed improvements/alterations” to the reference design included:

> “Improved connectivity and flexibility
>
> We have improved the flexibility of the high and low acuity bed areas of the HDU by standardising the multi bed bays and single rooms This enables the provision of the same level of equipment in each room, enabling the boundary between the sub departments to flex as demands on the service vary.
>
> It also provides the potential for the department to become all single bedrooms if future service demands change (as has happened in other departments to accommodate the infection control…”

11.31 On 10 July 2014 the Project Steering Board approved the prolongation of competitive dialogue by 8 weeks in order to promote design compliance. The minutes noted:

> "[Brian Currie] proposed that an 8 week prolongation of the competitive dialogue phase was introduced to facilitate design compliance across all three bidders. This milestone was to be met under current programme at Dialogue Round 5 (end of July) but it has become increasingly clear in recent weeks that due to the volume and intensity of design development and review iterations required to bring the 1:200 scale drawings and minimum areas to compliance with the Board's requirements this will not be achievable.
>
> It is the project team's firm view that the procurement process cannot progress to Draft Final Tender Stage until three design compliant bids are evidenced.
>
> The May 2017 Operational date would remain under this proposal but anticipated Financial Close date would move back 8 weeks to early October 2014. The intention is that this proposed prolongation would be absorbed in a shortening of the construction duration.
>
> The PSB were reminded that the project team have communicated previously growing concern of the inadequacies of the programme to deal with the level of design development necessary for a major acute health facility regardless of the availability of a 'Reference Design':
>
> 28 March 2013, 26th April 2013 and 31st May 2013 – 'Ability of Bidders to submit meaningful design proposals within competitive dialogue programme remains to be confirmed'.
>
> BC also confirmed that all three bidders had been asked for their view on the need for prolongation and, with varying degrees of duration, all confirmed that additional time was necessary. One bidder reluctantly agreed, when pressed, that they would be unable to comply in the time allocated given the status of their design submission to date.

The PSB accepted this proposal given the maintenance of the operational date however [Mike Baxter] expressed concern that Consort may use this prolongation to further delay completion of key enabling works. SFT have also previously noted this proposal in an email communication to the Project Director following a detailed briefing session."

11.32 On 12 July 2013, bidders received a brief change from NHSL. The brief change notified bidders that NHSL had applied for a single room derogation in DCN Acute Care. Bidders were requested to design DCN Acute Care to meet the clinical output specification. Changes were also made to the Project Brief for Theatres in both the RHCYP and DCN. The brief change also involved the inclusion of the former petrol station site within the Project site boundary following its acquisition by NHSL. These changes were raised with bidders and the relevant changes were made to the Project Agreement and construction documents (practical and legal changes only).

11.33 NHSL has advised the Inquiry Team that the Brief Change had limited impact on the Competitive Dialogue process. Competitive dialogue was extended not just to accommodate the Brief change but due to the overall process taking longer than initially anticipated.

11.34 By Dialogue Meeting 4B on July 24, 2013, IHSL's 1:200 design for Critical Care had 'B status: comments to be incorporated'. 'A status' was defined as 'no comments' and 'C status', which was given at the previous meeting of 20 June, meant 'unacceptable/resubmit'. The Action notes include comments on the drawings received for PICU/HDU/Critical Care/NICU. None relate to ventilation.

11.35 IHSL's informal submission for Dialogue meeting 4C included 'M&E Engineering Design Approach' (C8). This contained similar content to previous C8 submissions and noted outline designs have been subject to ongoing review for compliance with SHTM's, HTM's, etc. IHSL stated that:

- "We have undertaken internal Peer Reviews at Concept and Proposal Stages and will carry out a final review.

- C8.3 Environmental Matrix: No changes proposed at this time nor envisaged in the future but we will continue to review and advise back".

11.36 Also included with the submission were 1:200 drawings of the ventilation strategy. The drawings for the First Floor where Department B1 (Critical Care/HDU/Neo-natal surgery) as well as P1 (Theatres) were to be located provide a legend to show which rooms would require central supply and extract ventilation, central air supply, central general extract, central dirty extract, be HBN4 Dependent (isolation room guidance), be in line with SHTM 03-01, or have natural ventilation. No rooms in Critical Care are shown to be SHTM 03-01 dependent. Isolation rooms are shown to be 'HBN4 Dependent'. Single bed cubicles and open plan bays are shown as requiring central supply air. Central air supply for rooms in Critical Care is in line with the requirements in SHTM 03-01. A number of single bed cubicles have en-suites.

11.37 On 16 August 2013 Tim Davison, Chief Executive of NHSL, sent an email to Iain Graham, Brian Currie, Susan Goldsmith, Alan Boyter, Fiona Mitchell, and Edward Doyle, regarding a meeting with consultants in which they had expressed concern 'about the capacity and design of the new hospital, the lack of a 'service strategy' and most audibly, their feeling of being disconnected from influencing what was happening.' The consultants felt disengaged from the design process. A meeting was arranged for 6 September 2013 to discuss these issues. It is not clear to the Inquiry Team how this matter was resolved.

11.38 A paper was prepared by Sorel Cosens on 10 September 2013 for the Project Steering Board meeting on 13 September 2013. According to the paper, four additional dialogue meetings had been arranged to focus 'primarily on Bidders' compliance with operational functionality and room sizes' and the meetings were held with 'the Clinical Director, an NHSL Project Manager with detailed knowledge of the Reference Design, and our Architectural Adviser from Mott MacDonald.' The paper also notes:

"Outstanding design compliance after September will be addressed in feedback on the Draft Final Tenders; non-compliance would result in a bidder being informed that their submission would have been discounted without full evaluation had it been their Final Tender."

11.39 IHSL produced certain room data sheets dated 8 October 2013. They contain the acronym 'ADB' in the top left corner, 'Activity Database' in a banner at the bottom of each page and the Department for Health logo in the bottom corner. They contain the following information for rooms in Department B1 'PICU and HDU's':

Room name	Code	Revision date	Mechanical Ventilation	Ventilation type	Pressure	Filtration
Single-bed cubicle	B1401	25/09/2013	4ac/hr (supply)	Central supply air	positive	G4 – minimum
Single bed cubicle: isolation	B1401-01	08/10/2013	HBN4 dependent	HBN4 dependent	balanced	F7 - minimum
Open Plan Bay 3 Cots: neonatal	B1407-01	25/09/2013	4ac/hr supply	Central supply air	positive	G4- minimum
Single cot cubicle: neonatal	B1421	8/10/2013	4ac/hr supply	Central supply air	positive	G4 minimum
Multi-bed bay 4 beds low acuity	B1609-01	25/09/2013	4ac/hr supply	Central supply air	positive	G4 minimum
Multi-bed bay: 4 beds High Acuity	B1609-02	25/09/2013	4ac/hr supply	Central supply air	positive	G4 minimum

11.40 Draft Final Tenders

11.40.1 Draft Final Tenders were submitted by bidders on the 21st October 2013. This was a 'dry run' for the Final Tender, allowing bidders to set out their solutions to NHSL and for NHSL to provide feedback on whether aspects of the Draft Final Tender met NHSL's requirements as set out in the ITPD.

11.40.2 The draft final tender was not scored. It was aimed at ensuring that no bids would be dismissed for non-compliance and that there would be three compliant bids to assess. The focus was on ensuring the bids submitted were complete and able to be evaluated. A 'compliant tender' is one which complies

with the bid submission requirements set out in the ITPD, and which does not fail any of the pass/fail criteria.

11.41 The Inquiry Team understands that one bidder – Bidder C – submitted a marked up version of the EM. This sought to amend some of the entries to reflect Bidder C's ventilation strategy, "to enhance the proposed design criteria or to adjust values based on intended room use". Bidder C changed the air change rates for single bed cubicles and open plan bays in the PICU (Paediatric Intensive Care Unit) and Low Acuity department sub-groups from 4 ac/hr to 10 ac/hr. For single bed cubicles and open plan bays in the Neo-Natal and High Acuity department sub-groups Bidder C modified the air change rates to 6 ac/hr.

11.42 The Draft Final Tender review was completed on 13 November 2013 with Compliance and Feedback Reports issued to each Bidder. In order to "ensure fairness between bidders" no detailed feedback was to be provided "beyond setting out where that bidder does not meet minimum requirements". All of the bidders received the following feedback:

> "The Bidder should note there are a number of responses submitted in the Draft Final Tender that are unsatisfactory and, as such, currently constitute a 'fail' against the Board's minimum requirements; these unsatisfactory responses (clearly identified by inclusion of 'the Bidder has not provided a satisfactory response') MUST be addressed and failure to do so within the Bidder's Final Tender is likely to result in the Final Tender being rejected…
>
> The Bidder has not provided all the requirements as set out in ITPD Volume 1 Appendices AP1.1 Design Deliverables and AP1.2 Specifications; where these have not been submitted the Bidder has not provided a satisfactory response and this is likely to result in the Final Tender being rejected."

11.43 Feedback provided to IHSL alone was that:

> "The Board is disappointed that submissions have not developed in line with feedback and discussions in dialogue to date. The Board is unable to confirm whether the Bidder would meet the minimum requirements where an incomplete submission has been provided."

11.43.1 The Board held a final dialogue meeting with each bidder at which they provided feedback in relation to the draft final tender and clarified outstanding points. This final meeting took place on the following dates for each bidder:

> "(a) 19th November 2013 for Bidder A (B3);
>
> (b) 20th November 2013 for Bidder B (IHSL);
>
> (c) 21st November 2013 for Bidder C (Mosaic.)"

11.44 The action notes for dialogue meeting 6 held with bidder B do not record any feedback on the ventilation design, environmental matrix or room data sheets.

11.45 The following comments were provided with regard to the 'Approach to design and construction':

> "Where sections were 'under development' the Board cannot comment on IHSL's submission. The level of incomplete information caused considerable anxiety in a draft of final tender.
>
> NHSL will not review further submissions at this stage, however for sections submitted as part of Draft Final tender that the Board could not locate, IHSL are to confirm the title and location of the documents in Conject for the team to review.
>
> The Bidder will be informed if any such submissions do not meet the Board's requirements…"

11.46 The Action notes for Dialogue meeting 6 held with Bidder A and Bidder C do not record feedback on C8 Mechanical and Electrical engineering, nor do the

notes contain comments showing concern over the completeness of the draft final tender.

12. Close of Competitive Dialogue

12.1 Paragraph 5.15 of SCIM Guide 'From OJEU to Contract Award' states that the competitive dialogue stage should continue:

> "…until the contracting body is satisfied that it has identified the solution or solutions capable of meeting its needs and requirements with sufficient precision to enable Final Tenders (which fully meet these requirements) to be submitted."

12.2 Paragraph 5.19 states that:

> "There is no limit on the number of stages which can be used provided that, at the end of the dialogue, there are sufficient participants to allow for a genuine competition".

12.3 Paragraph 5.24 states that:

> "It is vital that the dialogue continues until the contracting body has clearly identified and specified its detailed requirements, the solution(s) capable of meeting its needs and this, the basis upon which final tenders should be submitted. It must be confident that the remaining participants have sufficient information/clarity to be able to submit fully developed and 'final' tenders as the next stage only permits 'fine tuning'"

12.4 The project team recommended to the PSB that the competitive dialogue phased was concluded. The recommendation to close dialogue was discussed at the PSB meeting held on 29 November 2013. After discussion of a number of points to do with outstanding bidder's concerns and land issues:

> "SG [Susan Goldsmith] asked the Steering Board to confirm their support for closing dialogue as planned on 6 December. PR [Peter Reekie] noted that while the points discussed were outstanding, he saw no reason for them not to be completed in the next week to achieve Close of Dialogue.

> BC [Brian Currie] summarised the position that the team had reached, with three affordable bids for designs that met the Board's requirements. The team were to be congratulated on this achievement, and SG asked BC to pass on her thanks to the wider project team."

12.5 At this meeting Brian Currie also "raised again the project team's concerns about achieving Financial Close with the Preferred Bidder in six months."

12.6 Given the feedback provided at the draft final tender stage, which included an expression of considerable anxiety in relation to incomplete information in IHSL's tender, it is not clear to the Inquiry Team why the project team and the PSB considered that it was appropriate to close the dialogue phase. This issue will require to be explored with witnesses at the hearing diet commencing on 24 April 2023.

13. Key Stage Review 2b: Pre-Close of Dialogue

13.1 The Pre-Close of Dialogue Key Stage Review was finalised on 13 December 2013.

13.2 Section 2: 'Project Requirements', question 2 asks:

> "Is the Procuring Authority, and are its advisers, satisfied with the overall quality and level of detail supplied by bidders during dialogue in respect of the design and build and service delivery solutions and that bidders' proposals are capable of meeting its requirements?"

13.3 The response given is:

> "Recommendation: That, prior to close of dialogue, the Board receives and copies to SFT, letters, in the form of the drafts which the Board have earlier provided to SFT, from each of its financial, legal and technical advisers confirming that each consider that it is appropriate for the Board to close dialogue."

13.4 Question 3 asks: “Based on dialogue with bidders is the Procuring Authority satisfied that the final tenders will contain solutions that satisfy its operational and functional requirements?”

13.5 The answer provided is: “Yes”.

13.6 Question 16 asks:

> “Please confirm what further development of technical information is required from bidders between now and final tender submission and from the preferred bidder between appointment and financial close. Is the Procuring Authority, and are its advisers, satisfied that this is achievable within the current project timetable?”

13.7 The answer provided is “yes” with the comment:

> “100% compliance for operational functionality and minimum room layouts has now been achieved with all bidders. The Board has reviewed the bidders’ programmes for design development through to financial close. The Board consider that the programme from preferred bidder to financial close is challenging.”

13.8 The conclusion in the KSR was that the Project was ready to proceed to the next stage subject to certain recommendations. These included letters being provided from financial, legal and technical advisers confirming that each consider that it is appropriate for NHSL to close dialogue.

13.9 The issues highlighted at the final tender stage, which included an expression of considerable anxiety in relation to incomplete information in IHSL’s tender, were not addressed within the KSR. It is not clear to the Inquiry Team why these issues were not addressed. This issue will require to be explored with witnesses at the hearing diet commencing on 24 April 2023.

**Volume 2 of the PPP will address the period from the close of Competitive Dialogue until the award of the contract. Provisional conclusions will be set out at the end of Volume 2 in relation to the entire procurement phase.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Provisional Position Paper 3

The Procurement Process for the Royal Hospital for Children and Young People and Department of Clinical Neurosciences

Volume 2: The Period from Close of Competitive Dialogue to the Award of the Contract

Purpose of the Paper

This Preliminary Position Paper has been produced to assist the Chair in addressing the terms of reference. It outlines the Inquiry Team's understanding of the procurement process for the award of the contract for the Royal Hospital for Children and Young People and Department of Clinical Neurosciences (RHCYP/DCN) project (the Project). Volume 1 addresses the period from the commencement of the procurement exercise up to the close of competitive dialogue. Volume 2 addresses the period from the close of competitive dialogue to the conclusion of the contract. Gaps in the Inquiry Team's understanding are also identified in both volumes. These matters will require to be explored in greater detail at the hearing set to commence on 24 April 2023. Further papers have been produced in relation to the development of the Reference Design and the Environmental Matrix.

An earlier draft of this paper was circulated to Core Participants (CP) for consideration and comment. Those comments have been considered by the Inquiry Team and taken into account in finalising this paper.

In due course, the Chair is likely to be invited by the Inquiry Team to make findings in fact based on the content of this paper. The Inquiry Team does not presently intend to lead further detailed evidence on the matters outlined in it, except where there are gaps in the Inquiry Team's understanding of the procurement exercise. However, it is inevitable that some of the matters covered in the paper will be touched upon to a greater or lesser extent in the hearing set to commence on 24 April 2023. In addition, it is open to any CP – through evidence or submissions – to seek to correct and/or contradict it. It is therefore possible that the Inquiry's understanding of matters set out in the paper may change, and so the position set out in this paper remains provisional. If it is the case that the Inquiry's understanding does change significantly, a revised edition of this paper may be published in due course.

Definitions and abbreviations from Volume 1 are utilised in Volume 2.

Contents

14. Submission of Final Tenders

14.1 On 16 December 2013, after the close of competitive dialogue, NHSL invited bidders to submit their final tender in accordance with the 'Invitation to Submit Final Tender' (ISFT).

14.2 The expectation for the design at final tender is set out in the Scottish Capital Investment Manual (SCIM), NPD Guide: Section 2, paragraph 5.67:

> "The design at Final Tender stage must be sufficiently developed to enable the best tender to be selected but does not need to be at the level of detail which would be expected at contract signature stage. The process of design development, provided it has no or minimal impact on overall cost, should be regarded as clarification of design which should still be permissible under competitive dialogue."

14.3 The design at this stage is expected to include 1:200 plans and 1:50 for key areas, cross sections, site plans, area schedule, and performance specifications to be used to provide a fixed price bid.

14.4 The expectation for the development of proposals generally is set out in paragraph 6.22 which states:

> "…It is important that the Body is happy that a number of participants have developed acceptable solutions which will require minimum development following submission of Final Tenders. No material changes can be made to bids following submission of final tenders, unlike the previous negotiated procedures approach adopted in many PPP projects."

14.5 The SCIM provides a table to show the 'Commitment expected at each stage of procurement from Participants on major projects'. For final tender stage:

Commitment expected at the end of final tender stage	
State of contract discussions at end of stage:	Agreement on all key contractual issues affecting price and risk allocation, including payment mechanism and performance regime.
Designer:	1:200 plans with key departments at 1:50
Design and construct sub-contractor:	Confirmation of acceptance of draft contract, payment mechanism, performance regime and allocation of risks within consortium.
Services sub-contractor:	Confirmation of acceptance of draft standard contract, payment mechanism, performance regime and allocation of risks within consortium.
Bidding consortium:	Full financial model. Agreement on all points of principle on specifications.
Financial and Economic Standing/Funding:	Statement of support from funders/equity with draft term sheet and acceptance of standard contract terms, payment mechanism and performance regime, financial model and allocation of risks within consortium.

14.6 Like the ITPD, the ISFT comprised of four volumes:

- Volume 1 set out the general requirements of the Board, this being background information on the project, final tender requirements and how NHSL intended to evaluate the final tender, award the project and communicate with bidders;
- Volume 2 set out the contractual requirements of NHSL, which included the final tender (bidder specific) NPD Project Agreement, the Articles of Association and the Payment Mechanism;
- Volume 3 set out the specific technical requirements of NHSL, these being construction (clinical and non-clinical requirements), equipment requirements and facilities management requirements;

- Volume 4 set out the Data Room (a cloud storage facility) available to bidders.

14.7 The ISFT was the same as the ITPD except for the following changes:

- Volume 1 was updated to reflect notifications issued during the course of Competitive Dialogue.
- Volume 2 contained the Final Tender (Bidder Specific) Project Agreement, which reflected amendments agreed between NHSL, SFT and each bidder during competitive dialogue. It was issued separately to each bidder.
- Volume 3 included the Final Tender (Bidder Specific) Service Level Specification that had been developed during Competitive Dialogue.

14.8 Volume 3 also includes the Environmental Matrix in appendix C. The Inquiry Team is unclear whether the version of the Environmental Matrix issued with the ITPD was replaced with a bidder-specific version at the ISFT stage for bidders that had suggested changes to the Environmental Matrix during competitive dialogue. This will require to be explored with witnesses at the hearing commencing on 24 April 2023.

14.9 A summary of the final tender requirements for the technical submission is as follows:

- an executive summary which would not be scored;
- ‘strategic and management approach’ proposals some of which were scored on a pass or fail basis and some given a mark;
- ‘approach to design and construction’ proposals, including design deliverables set out in Appendix AP1.1 of the ISFT, some of which would be scored on a pass or fail basis and some given a mark;

- ‘approach to facilities management’ proposals some of which would be scored on a pass or fail basis and some given a mark;

14.10 All technical submissions formed part of the ‘Quality Evaluation Mark’ for which forty marks were available. Of that mark, ‘strategic and management approach’ made up five percent, ‘approach to design and construction’ made up 23 percent and ‘approach to facilities management’ made up twelve percent. The remaining sixty marks out of a hundred were available for the price evaluation score.

14.11 As with the ITPD, Volume 1 set out general requirements. Section 2 was entitled ‘Technical Overview’. Paragraph 2.4.1 stated that the specific requirements were set out in the ‘Board’s Construction Requirements’ which were set out in section 3 of volume 3 of the ISFT. Innovation was encouraged but certain elements of the design, as they relate to Operational Functionality, were mandatory. This was described in Appendix E of volume 1 which was entitled ‘Reference Design Elements’.

14.12 Paragraph 2.5 was entitled ‘Reference Design and Mandatory Reference Design Requirements’. It outlined that a reference design had been developed which comprises mandatory and indicative elements. NHSL had spent time developing the reference design “…with significant clinical and stakeholder engagement…” prior to the commencement of the procurement exercise. The Mandatory Elements concerned Operational Functionality. In contrast to the ITPD, the ISFT contained new text explaining that NHSL would consider changes to the ‘Mandatory Reference Design Requirements’ (i.e. those elements relating to Operational Functionality) where a bidder considered that the ‘Mandatory Reference Design Requirements’ were not capable of meeting ‘the Board’s requirements’. The ISFT set out the process for bidders to notify NHSL of these changes. It also notes:

> “The Board confirms that the drafting in the ITPD around Operational Functionality is not intended to mandate elements of the Reference Design which demonstrably do not affect or impact Operational Use.”

14.13 Paragraph 2.5.2 addressed room layouts:

> "During Dialogue Bidders were required to develop 1:50 layout drawings for a selection of rooms. The Preferred Bidder will be required to develop 1:50 layout drawings for all remaining rooms prior to Financial Close."

14.14 Section 2.5.3 was entitled 'Room Data Sheets'. It narrated that standard form room data sheets have not been prepared by NHSL for the Project. The specific room requirements were set out in a combination of documents including 'The Board's Construction Requirements' and the 'Environmental Matrix'. Room Data sheets required to be developed for those rooms for which 1:50 layout drawings were prepared in dialogue as well as all Key Rooms and Generic Rooms. The ISFT stated that:

> "The Preferred Bidder will be required to complete Room Data Sheets for all remaining rooms prior to Financial Close."

14.15 The ISFT stated that Bidder's designs must achieve a "very good" BREEAM rating as a minimum.

14.16 Appendix K is entitled 'Certificate of Acceptance of Contractual Terms'. This was to give confirmation that the Board's Construction Requirements in volume 3 of the ISFT, and the NPD Agreement in volume 2, were acceptable to the tenderer.

14.17 Volume 3 of the ISFT, which set out the Board's Construction Requirements, did not contain changes to Section 2 'Project Wide Requirements' and Section 8 'Mechanical and Electrical Engineering Requirements' that are relevant to this paper.

14.18 Section 2 of Volume 3 sets out the general requirements of NHSL and lists the guidance to which the facilities must comply (including HTM and SHTM),

and explains the hierarchy of standards to use in cases of inconsistency or contradiction between standards contained in the guidance or the Board's Construction Requirements.

14.19 Section 8 states that "Project Co shall provide the Works to comply with the Environmental Matrix" and that Project Co shall ensure that the "design, construction and selection of components for the mechanical and electrical works" comply with the guidance listed in Section 2 as well as in Section 8.1. This includes SHTM 03-01 which provides guidance on ventilation for healthcare premises, and CEL 19 (2010) 'A Policy for Design Quality for NHSScotland', 2010 Revision published by the Scottish Government, which mandates the use of Activity Database (ADB) or an equivalent.

14.20 ADB referred to above is a computer software package developed by the Department of Health, England, that assists healthcare planners, architects and teams involved in the briefing, design and equipping of healthcare environments. Content for ADB is developed from technical guidance such as Health Building Notes and Health Technical Memoranda (HTM). SHTMs are the Scottish equivalent of HTMs. ADB can be used in the production of Room Data Sheets, which outline the environmental specifications for each room of the hospital.

14.21 Bidders submitted their final tenders on 13 January 2014.

14.22 IHSL's final tender for C8: Mechanical and Electrical Engineering Design Proposals included their ventilation strategy:

> "C8.2 (iii): Temperature Control:
>
> Internal design criteria have been demonstrated through thermodynamic modelling. The solution provides the benefits of natural ventilation supplemented by a mixed mode mechanical ventilation solution which when operating in conjunction with ceiling mounted radiant panel heaters provides an element of user adjustable control.

C8.2 (iv) Environmental Quality

Experiences from the adjacent RIE prove conditions are not acceptable when reliant on natural ventilation alone, a mixed mode ventilation approach has therefore been adopted which allows a maximum internal temperature of 25°C. Cooled air will be automatically delivered to the naturally ventilated spaces if the room temperature is sensed to be above 25°C to reduce the temperature. This 'peak loping' approach ensures the risk of overheating is minimized and thermal comfort is maintained while reducing energy consumption compared to a fully mechanically ventilated approach.

The ventilation, heating and comfort cooling strategy will ensure a good indoor air quality which together with the natural and artificial lighting strategy shall ensure comfort thus preventing sick building syndrome. Care shall be taken in the location of ventilation intakes to minimise the risk of external contaminants."

14.23 C8.2 (x) and C8.3 refer to the Environmental Matrix (EM). The requirement for C8.2 (x) was for bidders to provide an "environmental conditions/room provisions matrix" for both mechanical and electrical services for each room in the Facilities. C8.3 stated that a draft environmental matrix had been provided by the Board as part of the ITPD documentation, that bidders "must confirm acceptance of… highlighting any proposed changes on an exception basis". The EM was a spreadsheet that outlined the ventilation specifications for each room in the hospital. The development of the EM and potential inconsistencies between the EM and Scottish Healthcare guidance is the subject of the Inquiry's Provisional Position Paper 2.

14.24 IHSL's final tender submission for 'C8.2 (x) Environmental Conditions Room Matrix' stated:

"The mechanical and electrical services shall be provided in accordance with the reference design environmental matrix and we shall provide an addendum matrix for any rooms on an exception basis highlighting any changes at preferred bid stage.

Environmental Conditions:

We have followed the reference design and have utilised the reference design matrix to compile the room environmental proposal drawings listed below…"

14.25 A list of drawings followed, including the ventilation strategy for the first floor, where B1 Critical Care is located: titled 'WW -SZ-01 – PL -524-001_FT – First Floor Plan – Ventilation Strategy'. The drawing only indicates ventilation type, it does not provide more detailed data on the exact air change rate or pressure regime for different rooms. Shading is used to indicate the type of ventilation for each room, specifically, whether a room required "central supply and extract", "central supply air", "central general extract", "central dirty extract", "HBN 4 Dependant", "In line with SHTM 03-01" or "natural vent" ventilation.

14.26 IHSL's response to C8.2 (x) continues: "The room temperature set points, air change rate and ands [sic] shall be in accordance [sic] SHTM 03 [sic] and lighting information as CIBSE guide LG2."

14.27 Also under C8.2 (x), a table is provided, indicating that HDU (High Dependency Unit) should have 10 air changes per hour of supply air (stated as 'Ac/hr'). Air changes per hour refers to the number of times the entire volume of air in a room is completely removed and replaced with fresh air. The ventilation type, in this case 'supply' refers to the provision of fresh air into a room when the air movement needs to be controlled. Ventilation 'extract' involves the removal of contaminated air from a room.

Typical Room	Temperature		Ventilation		Lighting
	Design Maximum deg C	Design Minimum deg C	Supply Ac/hr	Extract Ac/hr	Normal Lux
Bathroom	28	18	0	10	200
Bedroom	25	20	4	0	100
Consulting Room	28	18	3	3	300
Clean Utility	28	18	6	0	150
Dirty Utility	28	18	0	6	200
HDU	25	18	10	0	400
Patient Accommodation Day	25	18	4	0	100
Multi-bed Wards	25	18	4	0	100
Treatment Room	28	18	10	0	500
Operating Theatre Suite	28	18	In line with SHTM03-01 in line SHTM03-01		500
Operating Theatre Recovery	25	18	15	15	500
Pantry	28	18	6	8	300

Text below the table states:

> "Where comfort cooled fresh air is indicated, the mechanical ventilation systems shall be supplemented by the ability to open the windows"

14.28 Under section 'C 8.3 Environmental Matrix' IHSL's submission stated:

> "As indicated above no changes proposed at this time nor envisaged in the future but we will continue to review and advise back. The solutions are refenced on the Heating, Ventilation and Cooling strategy drawings, sequence 521, 524 and 525 recorded in AP1.1 Section 5.1 Mechanical Drawing Schedule."

14.29 IHSL did not submit a separate environmental conditions room matrix or a marked up version of the EM with their final tender submission for C8. The drawings referred to above include drawings for the ventilation strategy for each floor, discussed above.

14.30 Bidder C described the following ventilation strategy in their final tender for 'C8 Mechanical and Electrical Design Proposals':

"…In order to maximise energy efficiency, the air flow rate will be based on the calculated flow to suit occupancy and provide required cooling as required [sic]. As a result of our study, we have proposed a lower air flow of four air changes/hr (which have been agreed in dialogue meetings, despite being lower than those specified in SHTM 03), and the addition of terminal cooling to achieve the required environmental control.

Ventilation air flow rates for mechanical ventilation will be based on a typical occupancy:

- Single rooms: one patient and two others (visitors or clinicians)
- Multi-bed rooms: as above, three people per bed space

These will result in a similar air flow to the provision of four air changes/hr included in the reference design, though with the additional benefit of terminal heating / cooling via the beam."

14.31 Bidder C's response to the requirement under C.2 (x) for an 'environmental conditions/room provisions matrix' was:

"The [Bidder C] environmental matrices have been produced to reflect the design criteria used as the basis of the [Bidder C] proposals. The criteria contained within the matrices are intended to represent the standards and strategy of the engineering proposals.

The matrices have been derived from the reference design environmental matrices in order to show where the design criteria have been modified to reflect the [Bidder C] engineering strategy.

Refer to Appendix 1 - Environmental matrix."

14.32 Under C8.3, bidders were asked to "confirm acceptance of the Board's Environmental Matrix, highlighting any proposed changes on an exception basis". Bidder C's response was:

"It is noted that the design data contained in the reference design matrices is considered to represent the mandatory standards and should be adopted by bidders. It is also noted that any deviations from the reference design matrices should be identified.

It is [Bidder C]'s intent to generally follow the reference design environmental matrices except where the criteria are modified by the different engineering strategies proposed, for example the proposed use of chilled beams combined with fresh supply rates based on occupancy. All adjustments to the reference design criteria have been highlighted in red in the proposed matrices.

Some other criteria have been modified to enhance the proposed design criteria or adjust values based on the intended room use. Again all adjustments have been highlighted in red."

14.33 Bidder C's response to C8.3 included further detail on the changes they made to the EM due to their engineering strategies. They did not describe changes made to the air change rates in Department B1 (Critical Care). Bidder C replicated the guidance notes contained in the EM "for clarity". The guidance relating to HDU bed areas and Critical Care areas stated:

"HDU bed areas:

Design criteria contained in HBN 57 gives specific guidance as well as SHTM 03-01 – especially Appendix 1 for air change rates – 10 ac/hr supply, 18°C to 25°C control range. This capability shall be provided but not at the summer and winter external ambient design extremes against the internal maximum and minimum range conditions. The department should be air conditioned and controlled on a zonal basis."

"Critical care areas:

Design criteria contained in SHTM 03-01, especially Appendix 1 for air change rates – 10ac/hr supply , 18°C to 25°C control range. This capability shall be provided but not at the summer and winter external

ambient design extremes against the maximum and minimum range conditions. NHSL may require specific rooms to have a control range up to 28C”

14.34 Bidder C’s EM contained changes to the specifications for Department B1 (Critical Care, HDU and Neo-Natal Surgery). In the PICU (Paediatric Intensive Care Unit) and Low Acuity department sub-groups the air changes for single bed cubicles and open plan bays have been changed from 4 to 10 air changes per hour. For Neo-Natal and High Acuity department sub-groups the air change rates have been changed from 4 to 6 air changes per hour.

14.35 IHSL’s energy strategy was to minimise energy requirements by adopting passive design features, which included using natural ventilation. This would help them to achieve ENE 01 BREEAM compliance, compliance with building standards, and achieve 90% of the desirable requirements of the Edinburgh Council Standard for Sustainable Buildings.

14.36 The input data used for their operational energy model includes mechanical ventilation specifications for a number of different room types, as well as an indication of whether or not natural ventilation would be used for that room. The list of room types includes “bedroom” and “ward areas” with 4ac/hr mixed mode ventilation. It does not include “HDU”, “Critical Care” or “Isolation”.

14.37 IHSL’s energy model and ventilation strategy is set out in their submission on Building Services Deliverables: Mechanical and Electrical Services. Paragraph 5.9.6 describes the Natural Ventilation Strategy:

“5.9.6.1 Purpose of Ventilation:

Ventilation in the healthcare environment can be naturally or mechanically driven and serves a number of purposes which can be summarised as follows:-

- Providing fresh air for normal respiratory purposes

- Diluting the level of CO2 in the space
- Removal of odours and pollutants
- Control of temperature and humidity
- Control of infection
- Specialist process requirements
- Occupants experience a feeling of wellbeing

The use of natural ventilation will minimise the need for energy to drive fans. However many clinical requirements, in for example Operating Theatres, necessitate the use of mechanically driven ventilation for close environmentally controlled spaces and departments having high equipment heat gains. Furthermore, despite carefully considered planning, building constraints invariably lead to spaces that do not have access to natural ventilation

…

Studies have been carried out into particular areas of the hospitals – wards, for instance, which make up a significant proportion of the hospital - to determine whether natural ventilation can be employed to achieve the purposes as set out above, within the targets set down by the Board in the ITPD documents."

14.38 The document notes, at paragraph 5.9.6.2, that "there are a number of situations in which natural ventilation may not be suitable or desirable" and states that local factors need to be taken into account which "include but are not restricted to", air permeability or air tightness of the building, outdoor air quality, indoor air quality, pollution and thermal comfort. The document states that while some departments or rooms within departments shall be mechanically ventilated "consideration has been given to naturally ventilating the maximum possible number of areas". It then refers to an analysis done on the "option of naturally ventilating the wards as they form a large proportion of the building". The document continues:

“5.9.6.3 Analysis of the ventilation strategy for the building

…

The thermal modelling has concentrated on the typical ward specifically considered two adjacent ward bedrooms located on each face of the main building. In association with the thermal modelling, daylight simulation calculations have been undertaken as part of a strategy to achieve a BREEAM ‘Excellent’ rating for ENE1 for the new hospital. These calculations determined the optimum window sizes required for the daylighting percentage.

Due to the low envelope air permeability mechanical make-up ventilation is provided to the bedrooms to match the extract from the adjacent bedroom en-suite toilet/shower rooms. This adds the benefit of being able to condition this air, particularly in warm weather, to assist in reducing overheating.

Below are two examples of simulations that were carried out to reach a final solution, however, these are the culmination of many other simulations carried out using differing design criteria and options.

Single Bedroom Ward, South Facing Exposed (Summer) with mixed mode ventilation

- Opening windows – restricted opening to 100mm.
- Supply air provided if the room air temperature is great than 25°C.
- External air 4 ACH cooled to 18°C.
- No reliance on uncontrolled infiltration for cooling.

…

5.9.6.4 Conclusion

The results show that in the wards a mixed mode, natural and mechanical ventilation combination…does provide the solution to meeting the overheating criteria in the rooms. It is proposed that all ward rooms adopt this mixed mode approach and are be provided with a means of cooling in

the form of tempered fresh air from central plant along with a restricted opening window.

It is envisaged that generally only small perimeter non clinical rooms with low occupancy and low heat gains will be solely naturally ventilated. Other similar but larger more densely populated rooms will employ a mixed mode system. Then as stated above the majority of the clinical spaces will be mechanically ventilated or mechanically or air conditioned."

14.39 The document goes on to outline IHSL's 'Mechanical Ventilation Strategy' at paragraph 5.9.7:

"The ventilation systems to the Hospital are designed in accordance with Scottish Health Technical Memorandum SHTM 03-01. Ventilation shall be provided to suit both the operational and statutory requirements of the development. Although the development has been designed to maximise the use of natural ventilation, it is intended that rooms will not be reliant on natural ventilation alone, unless they comply with maximum temperature limits listed in the RDS Environmental Matrices.

To obviate problems with overheating due to 100mm opening restrictions on opening windows, we have included for mechanical supply ventilation for the Ward Areas and to provide mechanical cooling to all tempered air supply air handling units to provide the ability to supply air temperature at a condition to ensure the internal temperatures in patient areas shall be maintained within comfort levels as illustrated within the separate Ward Bedroom Comfort Analysis Report."

14.40 Paragraph 5.9.10 describes the 'Specialist Ventilation Strategy', focusing on isolation rooms:

"Designated Isolation Rooms shall be provided with HBN4 positively pressurised lobby ventilation for isolation purposes along with

independent en-suite extract to roof mounted extract fans with discharge stacks or Hepa filtration as appropriate."

14.41 No further information is provided for any other rooms of the hospital which may require specialist ventilation for the control of infection or for other purposes. However, paragraph 5.9.14.1, which provides an overview of the 'Building Energy and Management System' states:

"The environmental conditions within the hospital spaces are controlled to ensure high levels of comfort to the occupants, overall energy efficiency of the system and also infection control needs and other clinical requirements as prescribed in the SHTMs."

14.42 Paragraph 5.12 refers to 1:50 drawings of 'mechanical and electrical services sections'.

14.43 IHSL's final tender for 'Specification for Ventilation Systems' included a section entitled 'Applicable Standards'. It states that: "The Ventilation System shall accord with all appropriate Hospital Technical Memoranda, Codes of Practice and Relevant British and European Standards and Appendix A". Under section 6.0 'Design Criteria' it states, "For ventilation/air change rates used in the design, the Sub-contractor shall refer to the ADB sheets."

14.44 Paragraph 8.1 is entitled 'Background to Ventilation and Air Conditioning Installations'. It states that the building is based on a mixed mode solution. Under 'U10 Ventilation systems', detail is provided regarding 'All Air Systems':

"…

Areas shall be controlled in zones or as individual rooms as necessary to achieve the conditions required by the ADB Sheets.

Supply plants shall incorporate panel type coarse pre-filters followed by high efficiency bag filters. Absolute HEPA (high efficiency particulate air)

terminal filters shall be provided only for ‘ultra clean’ areas such as UCV Theatres for Orthopaedic and Neurosurgical and isolation rooms. Some isolation rooms incorporate HEPA filters on the extract system.

Full humidity control, including humidification and dehumidification, shall be provided only in critical care clinical areas, such [as] operating theatres, recovery, radiology and MRI Scanner or wherever close control of humidity is required for the successful operation of sensitive equipment, e.g. computers, as advised by the ADB Sheets. Steam shall be provided by dedicated gas fired steam boiler plant and direct injection humidifiers.

Air pressure regimes for theatre suites shall be designed in accordance with the guidance provided in SHTM 03-1 employing wall mounted pressure stabilisers.

Air volumes have been established by consideration of heat gains or losses and also the air change rate necessary for comfort and safety as appropriate for the activity carried out in each area. Relative air pressures between rooms shall be maintained to suit the activity concerned, by design of the supply and extract air volumes, and use of pressure relief equipment where necessary to prevent cross infection or transfer of unpleasant odours between areas, as required by the ADB sheets.

Heat recovery shall be provided between the supply and extract systems. The hospital ventilation systems shall be in accordance with SHTM 03-01 Ventilation in health care premises, DW 144 and DW 143…”

14.44.1 DW 143, referred to above, is titled, ‘A practical guide to ductwork leakage testing. HVCA Publications, 1998.’ DW 144 is ‘Specification for sheet metal ductwork, low, medium & high pressure/velocity air systems. HVCA Publications, 1998.’

14.45 Information is provided regarding different room types, specifically, wards, isolation rooms, outpatient type departments, operating theatres, critical care departments, comfort cooled areas. Details regarding exact air change rates,

pressure regimes and other technical information is not provided. The section on Critical Care states:

> "Critical care departments such as ITU/HDU shall be provided with dedicated ventilation systems.
>
> The supply air ventilation plant shall heat and cool the air as required by the control system to provide the correct condition in the various rooms/zones.
>
> Final temperature control to the spaces shall be achieved by terminal reheaters controlled from user adjustable sensors within each space. Heater batteries shall be located wherever possible in plant areas, but where heaters can only be provided in the ceiling void of the occupied space they shall be located away from patient occupied spaces, i.e. bed spaces.
>
> Heat recovery shall be provided between the supply and extract systems."

14.46 For final tender submissions for section C2 'Robustness and Quality of Approach to design quality' bidders were asked to:

> "submit proposals setting out how the design will be developed to integrate the architectural, mechanical, electrical and civil and structural engineering aspects of the design to present a cohesive innovative design which meets all the Board's construction and stakeholders' requirements (including infection control and HAI-SCRIBE requirements). The submission shall utilise all Mandatory Reference Design Requirements to deliver a solution across all disciplines."

14.47 HAI-SCRIBE referred to above stands for Healthcare Associated Infection System (for) Controlling Risk In the Built Environment. The system was developed to ensure that infection prevention and control risks are identified and managed in the built environment (a hospital or other healthcare facility). The Infection Prevention and Control measures are put in place and

maintained for the lifetime of the healthcare facility by HAI-SCRIBE. The potential risks related to the proposed site development, design and planning, construction or refurbishment and ongoing maintenance of the healthcare facilities can be identified and managed by the HAI-SCRIBE system.

14.48 Infection control risks are identified at each of the following stages of the lifecycle of the healthcare facility using HAI-SCRIBE.

- Development Stage 1 – considers the initial brief and proposed site for development.
- Development Stage 2 – Design and planning
- Development Stage 3 – Construction and refurbishment
- Development Stage 4 – Pre-handover check, ongoing maintenance and feedback.

14.48.1 There are three key parts in respect of implementing the HAI-SCRIBE system:

Part A: Assembling the project team and ensuring that HAI-SCRIBE forms part of its responsibilities.

Part B: Assessing the risk by the use of question sets (1) – (4).

Part C: Gathering the information to inform dialogue. This is set out in the planning and design manual (SHFN 30, Part A).

14.48.2 IHSL's tender contained the following information in relation to 'Integrated Approach', 'Design Reviews', and 'HAI-SCRIBE':

"Integrated Approach:

Our whole team has pursued an integrated approach from our site wide master planning through to design development, detail design and clinical planning for all elements of the new RHSC & DCN facility. This has

involved coordinating the skills of the many specialist consultants together with input and feedback from NHS Lothian's team during the dialogue process...

Design Reviews

The Design Team have been meeting regularly through the detail design stages to ensure that all aspects of the structure, fabric and building services are fully integrated. We have also held three full 'Design Reviews' chaired by Chris Liddle our Design Champion to ensure that all aspects of the design including the clinical planning presents a cohesive design based upon function, clarify and the creation of a high quality environment for patients, staff and visitors.

…

HAI-Scribe

Throughout our development of the design we have taken cognisance of the requirements of HAI-SCRIBE and have designed in measures that will eliminate or minimise the effect of healthcare associated infection. We have ensured that infection control principles are incorporated into our design, drawing on national guidance particularly 'infection control in the built environment: design and planning (SHFN30 version 3).'

We have carried out internal HAI-SCRIBE reviews, however we are aware that it will require further reviews with NHS Lothian representatives (particularly infection control) as we continue to work through Preferred Bidder, Financial Close and construction on the live hospital campus and on-going maintenance.

IHS Lothian have undertaken a HAI-SCRIBE review as part of the ITPD stage and we will continue this throughout the whole project as we know that it is more cost effective to achieve management of infection at the planning stage. Such assessments and records will also assist the Board Infection Control Risk Management Group.

The building services installation has been designed in line with HAI-SCRIBE and the building services shall be reviewed at each of the stages in the HAI-SCRIBE risk assessment process.

We have also taken cognisance of the following and have developed designs to accommodate control of infection issues taking into account the following…"

14.49 What follows is a long list which includes en-suite toilets, isolation rooms, suitable ventilation systems, use of natural ventilation Critical Care areas are not mentioned.

14.50 In Section C2.2 "Site Analysis/Analysis of Board's Requirements" IHSL stated under "Mechanical and Electrical Engineering Requirements", that the engineering systems have been designed to comply with the list of SHTM's, HBN's and HTM's applicable to the facilities and listed within the BCRs. IHSL also stated that they had reviewed design guidance documents and principles set out in the BCRs and CEL 19 (2010), "A Policy for Design Quality for NHS Scotland".

14.51 Section C3, "Clarity and Robustness And Quality of Architectural And Landscape Design" contains a section C3.1 viii on how the design will fully address control of infection and HAI Scribe. IHSL's tender stated:

"We have taken cognisance of the requirements of HAI-SCRIBE and have integrated them throughout all aspects of the design. We have carried out internal HAI-SCRIBE reviews however are aware that it will require a comprehensive review with NHS Lothian representatives (particularly infection control) as we continue to work beyond Preferred Bidder towards Financial Close.

We have worked on the assumption that Development Stage 1 of the HAI-SCRIBE process has already been implemented and completed by NHSL and their technical advisory team and the following comments are therefore restricted to any design issues relevant to the current status of the scheme, which equates to part completion of Development Stage 2.

It is at this stage that we are required to identify any hazards associated with potential HAI risks and consider any measures which might be required to mitigate and manage them…"

14.52 IHSL included a copy of the HAI-SCRIBE "checklist for Development Stage 2: HAI-SCRIBE Applied to Planning and Design Stage of Development", which IHSL had completed. Under question 3.1 "Does the design and layout of the healthcare facility inhibit the spread of infection?", there is a tick under "yes". Under question 3.2 "Is the ventilation system design fit for purpose, given the potential for infection spread via ventilation systems", there is a tick under "yes".

14.53 IHSL's submission on 'Acceptable Post Preferred Bidder Stage Design Development Proposals and Design Programme' described how they would manage the design process to financial close should they be selected as preferred bidder. It included development of room data sheets and use of Activity Database:

"Room Data Sheets (RDS) Design Deliverables and Equipment Schedule – Enhancement and Improvement of the Design.

The PBS [Preferred Bidder Stage] Launch Meeting will be utilised to discuss the project set-up and project protocols. This is when the following items will be reviewed, to ensure that the RDS Work stream can progress to programme:

- Agree which Design Group will lead (assume Project Technical Design Group Lead). Possible detailed further review of rooms in appropriate Clinical Group – Key rooms and Generic rooms.
- Review Project Equipment Standardisation, including Equipment Unions.
- Project Database Set-Up.
- Review RDS already produced for the Rooms and agree proposed amendments based on above.

- Room Type Schedule – Review Room Types/ADB room briefing codes – agree number of types (encourage as much standardisation as clinically possible ie possible increase to Generic Rooms within the 31 types already established). Note this discussion will continue during the Technical Design Group/Equipment Design Workshops

  …
- Agree strategy for design development of Specialist Equipment (e.g. Imaging Equipment). Note this discussion will continue during the Technical Design Group / Equipment Design Workshops.

The RDS for the Generic and Key Rooms will be targeted for review in DDM 1 and remaining Room Types will be targeted for review in DDM 2 and agreed in principle in DDM 3 to allow the release [sic] the ADB database for commencement of the main 1:50 Design Programme. A summary of the initial RDS Production Programme (in ADB) is as follows:

- Generic Rooms – RDS brief agreement and release for 1:50 Design in DDM 1.
- Key Rooms – RDS brief agreement and release for 1:50 Design in DDM 1
- Remaining Room Types – RDS brief agreement and release for 1:50 Design in DDM 2 and DDM 3 (if required)…"

14.54 In their tender submission for 'C21: Compliance', IHSL confirmed compliance with the Board's Construction Requirements subject to any derogations scheduled in their submission for Section C30. Their submission C30 'Assumptions and Derogations from the Board's Construction Requirements' does not contain any derogations from SHTM 03-01, NHSL's mechanical and electrical requirements, or the Reference Design Environmental Matrix.

14.55 Bidder C's final tender Submission for C30 "Assumptions and Derogations" states:

"We confirm that our design solution complies with the Board's Construction Requirements, however, where there are specific areas of this document that we wish to clarify, our clarifications are set out below."

14.56 One of the clarifications is with respect to Section 8: Mechanical & Electrical Engineering Requirements: "Project Co shall provide the Works to comply with the Environmental Matrix". Bidder C's clarification is "Refer to [Bidder C] response C8.3 for comments on environmental matrix." Further clarifications are made regarding thermal requirements and internal air quality, the latter including reference to meeting requirements in SHTM 03-01.

15. Evaluation of Final Tenders

15.1 Evaluation of final tenders took place in the period from 13 January 2014 to 28 February 2014. This was a shorter period than initially programmed. In November 2012, after discussion between NHSL, SFT and SGHD, it was unanimously agreed to adopt a compressed programme with tender evaluation duration shortened from 75 days to 39 days.

15.2 The evaluation of each criteria set out in the final tenders was led by a member of the Core Evaluation Team and included members of NHSL's project team and external advisers.

15.3 In terms of the Quality Evaluation Criteria, which comprised of evaluating Section B (Strategic and Management), Section C (Approach to Design and Construction) and Section D (Approach to Facilities Management), this was arranged as follows:

- Iain Graham led the evaluation of Section B (Strategic and Management) and was supported by MM [Mott MacDonald], MacRoberts LLP and Ernst & Young. This was a scored and pass/fail evaluation;

- Brian Currie (NHSL) led the evaluation of Section C (Approach to Design and Construction) and was supported by MM. This contained a mixture of ‘scored’ and ‘pass/fail’ evaluations. Evaluation team members included:

  From NHSL:

  - Brian Currie (Project Director)
  - Janice Mackenzie (Project Clinical Director)
  - James Steers (Clinical Director)
  - Fiona Halcrow (Service Project Manager)
  - Janette Richards (Infection Control)
  - Neil McLennan (Capital Project Manager)
  - Ernie Bain (Estates Manager)
  - Charlie Halpin (Energy and Environment Manager)

  Advisers:

  - Richard Cantlay (Lead Technical Adviser)
  - Graeme Greer (Technical Adviser)
  - David Stillie (Technical Architectural Adviser)
  - Colin Macrae (Technical M&E Adviser)
  - Andrew Duncan (Technical Construction Adviser)
  - Fraser Littlejohn (Technical Planning Adviser)
  - Rod Shaw (Technical Cost Adviser)

- Jackie Sansbury led the evaluation of Section D (Approach to Facilities Management) and was supported by MM. This was a scored and pass/fail evaluation.

15.4 The price evaluation was led by Iain Graham, supported by Ernst & Young.

15.5 The document ‘Competitive Dialogue Project Plan and Final Tender Evaluation’ includes guidance on quality scoring for the technical submissions:

> “Using the Final Tender Evaluation Proforma in Appendix E, the Evaluation Group members will each undertake individual evaluation of the relevant evaluation criteria within each Bidders’ Final Tender Submissions against the prescribed scoring criteria before meeting with their Group in a workshop, chaired by the Core Evaluation Team member leading that Group, to agree the final consensus scores for each of the evaluation criteria for which that Group is responsible.
>
> Once the evaluation has been completed for each Bidder the Core Evaluation Author and CET [Core Evaluation Team] Lead will be responsible for preparing the final scoring report using the Final Tender Evaluation Scoring Matrix at Appendix F, with associated commentary, as appropriate. The completed scoring report will be submitted to the Core Evaluation Team to allow the final scores to be checked and verified and the selection of the Preferred Bidder to be made.”

15.6 The Inquiry Team understands that this guidance was followed in the assessment process with a consensus score being allocated.

15.7 Brian Currie and Ernie Bain (Estates Manager) from NHSL were responsible for evaluation of ‘C8 M&E engineering design proposals’ and ‘C10: energy management proposals’. They were advised by Kamil Kolodziejczyk and Colin Macrae, technical advisers from MM.

15.8 IHSL’s submission for C8 ‘M&E engineering design proposals’ received an overall score of 5, meaning ‘satisfactory’. This meant the evaluation team assessed that IHSL’s approach:

- demonstrates a satisfactory understanding of all aspects of the Board’s requirements; and/or

- proposes a solution which performs satisfactorily in complying with the Board's requirements.

15.9 According to the Reviewers' comments many of the components of IHSL's tender "lacked detail", were "basic" or "minimal", and some were not provided. Examples included:

- In terms of the requirement that "Bidder's **must** submit proposals setting out the engineering services design for each element of the scheme in sufficient detail to demonstrate compliance with the Board's Construction Requirements." the Reviewers determined that the brief was achieved. The comment provided is:

  "Lacking detail on design philosophy and BCR compliance".

- [The] "environmental conditions/room provisions matrix for both mechanical and electrical services for each room in the Facilities" section records that the brief was achieved. The Reviewers comment is:

  "No matrix provide, (sic) but environmental layout drawings provided."

- The section on "Major plant life cycle statements… to support the lifecycle costing analysis completed in the technical costs proforma." records that the brief was achieved. The Reviewers comment is:

  "Basic statement referring to CIBSE guidance for life cycles. No costs provided."

- C8.3 stated that "Whilst Bidders are required to undertake their own design, the Board has provided a draft Environmental Matrix as part of the ITPD documentation. Bidders must confirm acceptance of the Board's Environmental Matrix, highlighting any proposed changes on an acceptance basis." IHSL did not provide an a marked up environmental matrix, but in their submission had noted that "no changes proposed at this time nor envisaged in the

future." The Reviewers concluded that the brief had been achieved. The Reviewers commented:

"Good response."

15.10 It is not clear to the Inquiry Team why the Reviewers considered that IHSL's response in relation to the EM was "good". The Inquiry Team has identified potential discrepancies between values for environmental conditions in the EM and published guidance. These potential discrepancies are covered in greater detail in the separate papers on the Reference Design and the Environmental Matrix. The basis for assessing IHSL's response as "good" will require to be explored with witnesses at the diet of hearings commencing on 24 April 2023.

15.11 The proforma report for C10, energy management proposals, was scored 7, meaning "good". The Reviewers comments record that "Naturally ventilated room depths minimised to ensure effectiveness of single sided ventilation".

15.12 A document was prepared comparing the strengths, weaknesses and evaluation summaries of the three bidders final tender submissions for 'Design and Construct'. Both bidder A and bidder C scored higher than Bidder B (IHSL) for C8 "mechanical and electrical engineering". The weakness of IHSL's submission was: "Many sections do not have detailed descriptions or explanations. Two CHP proposed, three would be ideal." The 'strength' was "Good level of drawings provided". Bidder B received a score of 5 and the "evaluation summary" was "Satisfactory response, covering the required criteria". Bidder C received a score of eight and the evaluation summary was "Very good narrative descriptions on most elements providing a good level of detail to demonstrate compliance."

15.13 IHSL received the lowest score out of the three bidders for C8.

15.14 IHSL received the highest score out of the three bidders for C1, "meeting the stakeholders requirements", C3 "architectural and landscape design", C6 "Way finding and signage", C7 Interior Design Proposals, C9 "natural and

artificial lighting" and C24 "construction methodology". IHSL were the only bidder to receive scores above eight, including a score of nine for "Wayfinding and signage proposal", and 10 for "architectural and landscape design" and "interior design".

15.15 The submission for C21: "Compliance with Board's Construction Requirements" was assessed on a pass or fail basis, and C30: "Assumptions and Derogations" was not scored. David Stillie (MM) provided comments on all three bidder's responses to C30. With respect to IHSL, it was noted:

> "As IHS Proposals are compliant with a mandatory reference design requirements, we assume that all derogations which would have been required in construction of the reference design will be acceptable to NHS Lothian…
>
> This bidder has adopted the Reference Design and has accepted compliance with the Board's core requirements. The above represents those responses that I feel need further discussion with the Board or amongst ourselves before we can be happy with them."

15.16 In their submission for C30 Bidder C, had referred to their modified environmental matrix with respect to NHSL's requirement in Section 8 of the BCRs that "Project Co shall provide the Works to comply with the Environmental Matrix". David Stillie commented: "I assume Colin has looked at M&E content" but made no further comment with respect to Bidder C's proposed changes to the Environmental Matrix.

15.17 The scores for quality and price were compiled to complete the assessment of tenders. IHSL's combined score was the highest of the three bidders.

15.18 Sorrel Cosens prepared a paper for the PSB on 28 February 2014 confirming completion of the evaluation of final tenders. At this meeting, the evaluation of the three tenders was discussed. Brian Currie stated that the evaluation was "robust" and that a consensus had been reached. Brian Currie and Iain

Graham highlighted that the three bids were extremely close “which was a testament to the success of the competitive dialogue in ensuring that all three bids met NHSL's requirements”. The project team’s recommendation for appointment of the preferred bidder was approved for sharing with the NHSL’s Finance and Resources (F&R) Committee.

16. Key Stage Review 3: Pre-Preferred Bidder

16.1 Key Stage Review 3: Pre-Preferred Bidder Appointment was finalised on 28 February 2014. In Section 2 “Project Requirements”, Question three, states “Is the Procuring Authority, and are its advisers, satisfied that any further development of technical information required from the preferred bidder appointment to financial close is achievable within the current project timetable?”. The response is “yes” with the comment:

> "The Board has confirmed that all bidders have provided detailed programmes to cover the activities for the period until FC and that the development of the technical information is at least as advanced as the Board anticipated at this stage.
>
> The Board and its advisers are satisfied that any further development of technical information from PB appointment to FC is achievable within the current project timetable"

16.2 Section 5 was entitled “Commercial”. Question 29 stated: “Please describe the risks that the Procuring Authority considers to be most significant to the preferred bidder stage and the strategy for managing these risks”. The comment provided was “The key risks in the Updated risk register are as listed in Annex B”. The risk register in Annex B set out ‘key risks. “Programme delay in reaching Financial Close” was noted as a risk. Its status was ‘red’. The “Adequacy of Controls” was stated, in bold, as “**Not satisfactory at present**”. The risk register recorded that the project team “…continue to be

sceptical regarding delivery of financial close in less than six months from the appointment of Preferred Bidder".

17. Selection of the preferred bidder

17.1 Two papers were prepared for the (F&R) Committee meeting on the 5 March 2014. Brian Currie shared a paper detailing the tender evaluation process and selection of preferred bidder. It noted that the consensus of all evaluation meetings was that all three bidders passed the pass/fail criteria. The key risk highlighted was a potential challenge to the preferred bidder appointment by an unsuccessful tenderer. A report by Sorrel Cosens provided an overview of the assessment scores and an anonymised recommendation for the preferred bidder. The scores for the three tenders were assessed as: 86.11, 87.43 and 88.08.

17.2 NHSL also received updates from Ernst & Young, MacRoberts and MM. Mr Orr, of MacRoberts, stated that the procurement process had complied with the 2012 Regulations and best practice. The processes and procedures of SFT had also been followed. In terms of a letter dated 4 March 2014, Mr Cantlay of MM advised that he believed that from a technical perspective, the evaluation had been carried out in a manner consistent with the evaluation methodology. Mr Cantlay stated that from a technical perspective, it was appropriate for NHSL to conclude the evaluation process and appoint the preferred bidder.

17.3 The minute records that Mr Cantlay stated that the scores awarded for the technical evaluation criteria seemed correct and it appeared appropriate for the preferred bidder to be appointed. Mr Cantlay is recorded as stating that "…the scores were all appropriate and he was happy with the evaluation and satisfied that the preferred bidder was in full accordance with the requirements". Mr Currie stated that all three bids had been of an acceptable quality. The minute records, at paragraph 61.16, that:

"Everything possible had been done to mitigate the risk of poor quality facilities and/or poor services being provided to NHS Lothian."

17.4 At the meeting, the Chair sought confirmation that the price in the contract would be fixed. Mr Orr, MacRoberts, confirmed that there would be a fixed price contract in place subject to any variations or agreed increases.

17.5 The Finance and Resources Committee agreed to note the outcome of the scored evaluation and the assurance statements provided by the legal, technical and financial advisers along with the completion of the KSR (appointment of preferred bidder) by SFT. The Committee unanimously approved the selection of IHSL as the preferred bidder.

17.6 Following authorisation by the Finance & Resources Committee, the Board of NHSL issued a preferred bidder appointment letter to IHSL on 5 March 2014 (the PBA Letter). Standstill letters were issued to the unsuccessful tenderers on 5 March 2014.

17.7 This PBA Letter states that:

a) "IHSL's Final Tender submitted on 13 January 2014, as clarified and amended by Schedule Part 5 (Clarifications in respect of IHSL's Final Tender) of the Preferred Bidder Appointment, has been evaluated as the most economically advantageous Final Tender; and

b) Subject to IHSL and each member of its consortium accepting the conditions set out in this Preferred Bidder Appointment…

the Board has approved the recommendation to appoint IHSL as the Preferred Bidder for the Project on the basis of its Final Tender…"

17.8 The PBA Letter formed the basis for the preferred bidder appointment. Schedule Part 1 (Terms of Preferred Bidder Appointment) set out the terms of IHSL's appointment as preferred bidder. The terms included the following:

- IHSL was required to use its best endeavours to diligently progress the Project to Financial Close on 2 October 2014 and thereafter use its best endeavours to achieve a completion date of 17 February 2017.
- IHSL was required to work with NHSL to develop, agree, and finalise the outstanding issues set out in Schedule Part 3 and Schedule Part 4.
- Section 4.4 of Schedule Part 1 required IHSL to develop certain technical schedules of the Final Tender NPD Project Agreement, including room data sheets. Section 4.5 states that: “IHSL shall further develop their Design included within their Final Tender to the level set out in the Invitation to Submit Final Tender (as a minimum).”
- Schedule Part 2 (Preferred Bidder to Financial Close) set out the timetable to reach financial close of the Project.
- Schedule Part 3 (IHSL’s outstanding issues to be addressed in respect of the Project) set out the issue to be resolved, including legal and contractual issues, interface issues, strategic and management issues, design and construction issues, facilities management issues and planning issues.
- Schedule Part 4 (IHSL’s gaps in relation to the Final Tender (Bidder B) NPD Project Agreement) set out any gaps in this Project Agreement. This included “Schedule Part 6 (construction matters) Section 4: Project Co’s Proposals” and “Schedule Part 6 (construction matters) Section 6: Room Data Sheets” to be provided by Project Co.
- Schedule Part 5 (Clarifications in respect of IHSL’s Final Tender) sets out the clarifications raised by the Board in respect of IHSL’s Final Tender. These clarifications clarified or amended IHSL’s Final Tender.

- IHSL required to use its best endeavours to diligently develop the "IHSL technical Schedules of the Final Tender (Bidder B) NPD Project Agreement) including Schedule Part 6, section 6 (room data sheets)."

17.9 Paragraph 4.5 stated that:

> "IHSL shall further develop their Design included within their Final Tender, with the minimum level of design requirements being those set out in the ISFT."

17.10 NHSL and MM have advised the Inquiry that it is not unusual to have a number of outstanding issues, gaps and points for clarification at this stage of the procurement process.

17.11 IHSL returned a signed Preferred Bidder Letter to the Board on 7 March 2014. From this point onwards, IHSL was the preferred bidder. However, no formal contract had been concluded for the project itself.

18. Development of design during the post-preferred bidder stage

18.1 Further design development took place from March 2014 to financial close. The first meeting between representatives of NHSL and IHSL was held on Thursday 13 March 2014. Members of NHSL's project team, NHSL's advisers and IHSL moved into project offices together to facilitate regular engagement. Wallace Whittle/TUV SUD were responsible for progressing the design of the mechanical and electrical building services, including the ventilation system. Wallace Whittle/TUV SUD were consultants subcontracted to Brookfield Multiplex, the member of IHSL's consortium responsible for the design and construction of the hospital.

18.2 A number of meeting groups were set up including the Project Delivery Group (PDG), Project Management Group (PMG), Design Steering Group and other workstreams. Attendees included representatives from NHSL, NHSL's advisers, and IHSL. Additional meetings were set up to progress different workstreams. The RHSC and DCN Steering Board Commercial Sub-Group was set up following a Special Steering Board meeting on 22 August to address slippage with the programme to financial close. Attendees included representatives from NHSL, SFT, IHSL and Scottish Government Health and Social Care Department.

18.3 Patrick MacAulay from HFS was invited, and agreed, to attend meetings with NHSL on detailed design development, specifically for the more complex departments such as theatres, radiology, critical care and emergency department.

18.4 The scope of the expected development of design had been set out in the Preferred Bidder Letter sent in March. MM later provided additional feedback on IHSL's M&E final tender in a feedback report, dated 23 May 2014. The report stated the following with respect to engineering services and ventilation in particular:

Criteria	**Feedback on IHSL's response**
Engineering services design and compliance with BCRs	IHSL response was lacking detail on design philosophy and compliance with BCRs.
Temperature, ventilation and comfort of occupants	More detail required.
Quality of the environment and sick building prevention	Lacking detail description on prevention of sick building syndrome and quality of environment. Only basic statement focusing on ventilation issues provided.

An environmental conditions/room provisions matrix for both mechanical and electrical services for each room in the Facilities.	Environmental drawings provided but no matrix.
General comments	Many sections do not have detail description or explanation.

18.5 At the PSB Meeting of 20 June 2014 Brian Currie reported that "Technical schedules (Project Co proposals) development is behind programme but now well underway". Change management was discussed at this meeting. There was a distinction between design development and a change to the design. A 'Change' refers to instances where NHSL's requests for further development of the design was a change to the stated requirements to the extent that costs need to be revised. The process for dealing with a Change were set out in Schedule Part 16, "Change Protocol". The action notes of the PSB meeting record:

> "The design process is logging any requested changes to the final tender design. IHSL and NHSL then agree whether these can be classified as design development or should be treated as a change. BC hopes that the genuine changes will be small in number and value, to be confirmed after completion of design at the end of July.
>
> …PR acknowledged that change would always be a factor at this stage in a project, and that the aim for all parties was to manage this within the cap…."

18.6 On 9 July 2014, the F&R Committee were informed that design development was progressing on target, and "An intense period of developing the detailed design of the building with staff and users is well underway, scheduled to complete by the end of July 2014."

18.7 In July and August 2014, IHSL prepared revisions of their proposal “Section 4.23 Specification – Building Services” for financial close. The document was checked by Stewart McKechnie, (Director, TUV SUD/Wallace Whittle). The only mention of the environmental matrix is in relation to lighting.

18.7.1 The majority of the information in the section on specification for ventilation systems is the same as that provided in the final tender and described in section 14 of this paper: “Submission of Final Tender”: Under section 5.0 “Applicable Standards” it states:

> “All elements of the works shall be in accordance with the requirements of current legislation, regulations and industry standards unless otherwise stated.
>
> The Ventilation System shall accord with all appropriate Hospital Technical Memoranda, Codes of Practice and relevant British and European Standards…”

18.7.2 Section 6.0 on design criteria contains one difference, stating that for ventilation air change rates used in the design, it was “Project Co” (i.e. IHSL), rather than the sub-contractor, who “shall refer to the ADB sheets”.

18.7.3 Section 8.1 “Background to Ventilation and Air Conditioning Installations” states:

> “The building is largely sealed with limited openable windows in order to control the internal environment within the spaces.
>
> The building ventilation is based on a mixed mode solution where it permits, utilising openable windows together with mechanical vent and a peak lop cooling solution.
>
> The Hospital shall be mechanically ventilated:-

- Throughout all internal rooms that have no access to natural ventilation
- Perimeter areas where mechanical ventilation is required for clinical reasons
- Perimeter areas where mechanical ventilation is required for operational and environmental control reasons…
- Ward areas throughout

The various departments to match their function shall be served by a number of ventilation air handling systems..."

18.8 U10 "Ventilation Systems: All Air Systems" states that:

"…Areas shall be controlled in zones or as individual rooms as necessary to achieve the conditions required by the ADB Sheets.

…

Air pressure regimes for theatre suites shall be designed in accordance with the guidance provided in SHTM 03-1 employing wall mounted pressure stabilisers.

Air volumes have been established by consideration of heat gains or losses and also the air change rate necessary for comfort and safety as appropriate for the activity carried out in each area. Relative air pressures between rooms shall be maintained to suit the activity concerned, by design of the supply and extract air volumes, and use of pressure relief equipment where necessary to prevent cross infection or transfer of unpleasant odours between areas, as required by the ADB sheets.

…The hospital ventilation systems shall be in accordance with SHTM 03-01 Ventilation in health care premises, DW 144 and DW 143."

18.8.1 Additional information is provided in relation towards, isolation rooms and critical care departments along with some other room types, but does not go into detail regarding ventilation specifications such as air change rates. The section on critical care departments states:

> "Critical care departments such as ITU/HDU shall be provided with dedicated ventilation systems.
>
> The supply air ventilation plant shall heat and cool the air as required by the control system to provide the correct condition in the various rooms/zones.
>
> Final temperature control to the spaces shall be achieved by terminal reheaters controlled from user adjustable sensors within each space. Heater batteries shall be located wherever possible in plant areas, but where heaters can only be provided in the ceiling void of the occupied space they shall be located away from patient occupied spaces, i.e. bed spaces.
>
> Heat recovery shall be provided between the supply and extract systems."

18.9 A Special Steering Board meeting was held on 22 August 2014 involving NHSL, Mike Baxter from the Scottish Government Health Department, Peter Reekie from SFT and Richard Osborne and Ross Ballingall from IHSL. The purpose of the meeting was to raise NHSL's "significant concern" about the project programme and give IHSL an opportunity to discuss progress. The NHSL project team presented a revised programme with slippage of eight weeks, and IHSL tabled their own programme.

18.9.1 The production of room data sheets was discussed at the meeting. The minutes record that:

> "…NHSL and the PB [preferred bidder] had reached agreement on the content of the room data sheets (RDS) the day before, and so the production of RDS could begin and that this was on track for completion

by 05/09/14. BC noted that NHSL are comfortable that 100% will not be completed for financial close, although the prioritisation of what was definitely required was still to be agreed."

18.9.2 It is not clear to the Inquiry Team why NHSL was comfortable that all room data sheets would not be completed by financial close. Both the ITPD and the ISFT stated that the preferred bidder would be required to complete all room data sheets before financial close. It is also not clear what was agreed in relation to the content of the room data sheets. These issues will require to be explored with witnesses at the diet of hearings due to commence on 24 April 2023.

18.9.3 At the meeting, Brian Currie noted that technical information which would be captured in Project Co's Proposals – which would form part of the Project Agreement and which constituted IHSL's response to the Board's Construction Requirements and extensive design development - "are not yet completed, with some way to go in certain areas."

18.9.4 Brian Currie also noted "that in dialogue and the invitation to submit final tenders NHSL had been clear on the requirements and deliverables for the programme and that IHSL had been slow to get started." Susan Goldsmith was concerned that the updated programme "would also prove impossible to deliver."

18.9.5 Ross Ballingall of Multiplex stated that "…there was a genuine mismatch in NHSL's and IHSL's expectations, where IHSL were being asked to deliver much more than on other projects, and considerably more than was required for comfort of operational functionality.' He felt that this "demonstrated a 'paranoia and lack of trust' in IHSL."

18.9.6 Peter Reekie noted that "changes in design development would always happen, and asked if IHSL had responded with costs to progress discussions."

18.9.7 Iain Graham “noted that the revised programme proposed shows what information NHSL requires to have sufficient information to have comfort of operational functionality of the design, in order to provide the LTA with sufficient confirmation to proceed to credit.”

18.10 On 25 August 2014, the register of ‘Technical Risks to Financial Close’ recorded as an issue:

> “Project Co proposals insufficiently developed to required level for FC”.

18.11 The risk impact was rated as “high”. Current mitigation measures included providing feedback on the Project Co Proposals (PCPs) structure, and draft one of the PCPs, and setting out the NHSL’s expectations in a PCP workshop and setting out NHSL’s expectations on individual workstreams. A proposed further mitigation post financial close was to:

> “increase the length of the RDD [Reviewable Design Data] list.
>
> Focus on specific design risks.
>
> Fast track the legal review”.

18.11.1 Additional issues given a high risk impact were “lack of review time” for the PCP strategy documents and drawings. Mitigation measures were not recorded.

18.11.2 The risk register also recorded that “due to the current status of the PCPs. The RDD list could be extensive”. This was classed as having a medium risk impact. In the column “potential further mitigation required post FC” it was recorded:

> “Long list of RDD due to further iterations of drawings etc. to be made etc. Board require to both resource the requirements for review and

understand the rights of comment they have within the Review Procedure (which is where RDD is reviewed). This should then mitigate risk of Project Co claiming changes."

18.11.3 RDD referred to above means "reviewable design data". Reviewable design data included design deliverables and Project Co Proposals that had not yet been approved by NHSL. A design deliverable or Project Co Proposal that was approved by NHSL was given level A status meaning construction could commence based on that design document or proposal. Level B status meant that Project Co could proceed on the basis of the document subject to comments that NHSL had made against that item. Level C status meant that Project Co could not proceed with construction in terms of that item until it had been amended in accordance with the NHSL's comments and had undergone the review procedure outlined in Schedule Part 8 of the Project Agreement. Level D status was given to items that were rejected by NHSL and required resubmission. The schedule of Reviewable Design Data was included in the Project Agreement, Schedule Part 6 (Construction Matters) Section 5 (Reviewable Design Data).

18.12 At the F&R Committee meeting of 27 August 2014 Susan Goldsmith stated that following IHSL failing to achieve the deadline for the RIE interface documentation, financial close for this project would be delayed until November 2014. The minutes record that progress would be closely monitored through monthly meetings to ensure that financial close remained on target for November 2014.

18.13 On 23 September 2014, Brian Currie emailed Susan Goldsmith and copied in Iain Graham and Moira Pringle to outline his concerns about the Project. He noted that the PCPs continue to be a struggle for IHSL. Difficulties identified included a lack of technical information and outstanding design issues. These included the extensive list of derogations. Mr Currie noted that: "There is a potential risk that under strict procurement rules this extended list could be considered so different from IHSL's tender that another bidder may challenge

fairness". Mr Currie stated that the list of derogations was considerably longer than that submitted at final tender. Mr Currie note that IHSL would not be provided all the Room Data Sheets as had been expected:

> "Operational Functionality
>
> Debate continues with IHSL over a caveat that we are insisting on given IHSL are unable to deliver all 1:50's and Room Data Sheets prior to FC as they committed to at final tender.
>
> Room Data Sheets
>
> IHSL have promised 123 RDS's (less than 50% of rooms) prior to FC. Given we will be some way short, our operational design notes will not be evidenced and hence require to be added to our BCR's as a contractual obligation.
>
> We have yet to receive IHSL's environmental matrix promised some time ago"

18.14 Mr Graham responded to this email on 24 September 2014. Mr Graham noted that IHSL had "expended their pre FC funds". He did not consider that the position would be significantly different with another bidder. Mr Graham stated that:

> "Brookfield Multiplex have maintained the 'trust us we will build what you want' and not evidenced the engagement with the NPD requirements. This is a matter of us (Brian principally) to judge the risk on the design development versus potential for delivering what we expect. It appears to me that they are commercial; have not delivered drawings and design development to programme and are introducing new items or caveats "under the radar" throughout the design development. This is either because the designers are not up to speed because they have expended fee allowances or that BM are controlling the position for commercial effect or combination of both."

18.15 A number of options, which included the option to reject IHSL as preferred bidder, were set out by Mr Graham. Mr Graham's recommendation was to "accept the position" to try to "nearly meet" the proposed programme.

18.16 During September and October 2014 IHSL submitted revisions of the Environmental Matrix. NHSL, following advice from MM, provided feedback. An issue was identified with the ventilation design for single bedrooms, specifically around their proposal of four air changes per hour, openable windows and positive pressure. It was noted that SHTM 03-01 says six air changes per hour and recommends a balanced or negative pressure regime. The development of the Environmental Matrix during this period is described in detail in the Inquiry's Provisional Position Paper 2 on the Environmental Matrix.

18.16.1 On 21 October 2014, Brian Currie reviewed IHSL's drawing showing the ventilation distribution for Department B1 where Critical Care/HDU was located. The drawing was given RDD level C status. This meant that it was "subject to amendment as noted". The drawing was included in the RDD Schedule Part 2 "Non Approved RDD Items" with detailed comments provided by NHSL, including: "Drawing significantly lacks detail in order to provide a suitable review" and: "Full design to be in line with all PCPs, BCRs, manufacturer's guidance and SHTM requirements."

18.17 On 31 October 2014 the Commercial Sub-group of the Project Steering Board discussed the programme to achieve the revised target for financial close, which was set to 12 December 2014. There was a concern that "failure to meet this third attempt at FC would make all parties look foolish," that slippage into 2015 "would cause significant problems for both the Board and IHSL" and that there was reputational risk. NHSL proposed that any further delay to financial close be "absorbed in the construction period" and discussed cost implications of the delay. NHSL raised concern that IHSL had not yet provided a full and realistic programme to the hospital opening date. The development of technical information was discussed:

“Funders…require certainty and line drawn in the sand as technical information would surely continue to develop post-FC…

… PR [Peter Reekie, SFT] asked JB [John Ballantyne, Commercial Director, IHSL] if, in his opinion the Board had changed what it is asking for since the invitation to tender. JB replied that there was a difference of opinion over the level of detail expected in Project Co's Proposals (PCPs), but the open-ended requirement that 'the Board has to be satisfied' was difficult to achieve. JB acknowledged that the Board had agreed latitude on signing off operational functionality where 100% technical info not yet produced. Also, the Board's Construction Requirements had been updated in dialogue with IHSL, which reduced the extensive list of derogations that would be required of IHSL. These were examples of Board/IHSL negotiation to reach a pragmatic position in technical documentation for FC.

BC [Brian Currie, Project Director] noted that if the design development had generated key technical information for review earlier in the process then areas of challenge… could have been addressed and resolved earlier. JB noted that sign-off of the 1:50 design buy [sic] the Board had delayed the programme; BC acknowledged this, but that this could only account for two weeks of slippage and all had previously agreed that this particular activity has gone well. The production of the supporting architectural and engineering information has not been as successful...

…

SF [Sean Ferm, Commercial Manager, Macquarie Capital Group Ltd] confirmed that most PCPs [Project Co Proposals] had been issued to the LTA, with the exception of civil and structural, BREEAM, and acoustics. JB pointed out that the deadline to close PCPs had been 31/10/14 and that they were unlikely to meet this by the end of the day. BC confirmed that the Board has some technical queries outstanding on PCPs but have advised that these should not be material and therefore should not delay issue to the LTA. PR advised the Board and IHSL to resolve these issues

or to ensure that they were captured as reviewable design data post-FC. BC undertook to review the Board's outstanding PCP queries with their technical adviser and collate any such non-material issues into a schedule to be addressed post-FC.

The final list of derogations from the BCRs to be provided by IHSL later that day; the Board will review and respond to these on 03/11/14.

BC noted that while drawings feedback had been provided, IHSL had challenged some of these and the Board had met with them to discuss and confirm the position. All outstanding drawings comments are to be issued by the Board on 03/11/14. It was noted that IHSL may want to meet to confirm some of these before they were fully concluded, and this would need to be prioritised in w/c 03/11/14.

Conclusion of the energy strategy requires a meeting between the Board and IHSL as soon as possible in the w/c 03/11/14.

…

The group agreed that, regardless of the FC date, IHSL and the Board should proceed to agree finalised technical documentation by 12/11/14 at the latest."

18.18 The F&R Committee was updated on the programme to financial close at their meeting on 12 November 2014. Brian Currie and Iain Graham prepared a paper explaining the factors affecting the programme. These included technical issues, issues with CapEx (capital expenditure), as well as revenue consequences for Facilities Management and Life Cycle maintenance, the funder (the European Investment Bank) and Consort interface. With respect to technical issues the paper noted, "the production of the necessary legal documentation (Project Company Proposals or PCPs) and plans have been slower than necessary to avoid impacting on the critical path."

18.18.1 With respect to key risks, the paper noted:

- "The IHSL consortium members have both a cost and reputational imperative to see early Financial Close. However, the terms have to be acceptable.

- It is the Project Directors view that FC will not be achievable before February, 2015 and that there is limited scope to shorten the construction programme without significant risk to quality. As such, an operational date in September, 2017 should be anticipated at best.

- It is also hoped that the reasons for the slippage in programme to conclude FC is not repeated post FC. These are principally:

    1. Lack of appreciation and experience of the process to FC by the constructor element of the Preferred Bidder
    2. A "design [and] build" mentality prevailing by the constructor i.e.., determination to keep design intent as open as possible to maximise commercial advantage post FC.
    3. Poor management by the Preferred Bidder.

- Mitigation measures include seeking a compensating shortening of construction programme; removal of an inflationary uplift due to the period of time since tender."

18.19 The paper was discussed at the F&R Committee meeting on 12 November 2014. The Committee "expressed disappointment and concern at the delays" and the Chair "commented that the Committee was not reassured by the process and it would be important to demonstrate that risk management was in place before the Committee could be reassured." Brian Currie advised that "NHS Lothian was managing the project as best as it could but that many of the present issues were outwith NHS Lothian's control…NHS Lothian's legal

adviser had stated that NHS Lothian was going above and beyond what they were legally required to do in order to expedite the process." The Committee agreed to note the financial close programme and the governance in place to support NHSL's requirements.

18.20 By 18 November 2014, the risk register recorded that "Programme delay in reaching Financial Close" was "red". The programme was delayed due to delayed delivery of detailed design "sufficient to proceed to financial close". The "Adequacy of controls to minimise risk and achieve programme" were recorded as:

> "**Not satisfactory at present**
>
> …Close management of progress ongoing, including engagement at most senior level in IHSL by Steering Board Commercial sub-group…"

18.20.1 Performance of Building (described as "Building does not operate to specification…") was noted to be "Green". The risk register recorded that:

> "Board requirements stated clearly in procurement documentation and competitive dialogue"

18.20.2 The risk register recorded that the risk of Scottish Government approval was "green". There was a £50 million contingent liability at final business case should the project not proceed. Despite the green rating, the comment was:

> "**Not satisfactory at present**; FBC presented to SCIG on 05/08/14 and considered 26/08/14…"

18.21 On 18 November 2014, NHSL prepared a paper entitled "Board Commentary on the Technical Information Requested by the Board and Technical Information issued by IHSL". The paper records that notwithstanding the

requirement in the ISFT for the preferred bidder to complete all room data sheets by financial close, NHSL had agreed to reduce this to approximately 40% of rooms. NHSL also agreed to suspend the development of 'Project Co Proposals' and create an additional category of RDD. The paper noted that the quality of information submitted by IHSL was "not in line with the level expected". The paper concluded that:

- "The level of information requested by the Board and accepted by IHSL has been clearly documented;
- The level of information requested is considered reasonable and in line with other projects;
- The Preferred Bidder has been late in providing information at each stage;
- The quality of the information submitted has not been in line with the level expected."

18.22 The Inquiry Team understands that on 19 November 2014, a HAI-Scribe (Healthcare Associated Infection - Systems for the Controlling Risk in the Built Environment) report identified a risk with the ventilation system, specifically due to air pressure in single bedrooms. On 12 January 2015, TUV SUD/ Wallace Whittle submitted a revised single bedroom ventilation strategy. On 13 January 2015, Janette Richards, NHSL's lead HAISCRIBE Infection Prevention and Control Nurse, consulted Ian Stewart (Consultant within HFS' Engineering and Environment department) regarding IHSL's strategy. Ms Richards was concerned that IHSL's proposal for openable windows would affect the pressure regime in the room and have implications for infection control. HFS advised against the use of openable windows in the design, and recommended sealed windows which would allow air flow patterns to be controlled. On 29 January 2015, NHSL advised IHSL that:

- "The single room with en-suite ventilation design shall comply with the parameters set out in SHTM 03-01.

- The design solution should not rely in any way with the opening windows as these will be opened or closed by patient choice.
- The critical factor from SHTM 03-01 for infection control will be the resultant pressure within the room being balanced with or negative to the corridor.
- Isolation room ventilation shall comply with SHPN 04 Supplement 1."

18.23 The discussion between relevant parties regarding the perceived issues with TUV SUD/Wallace Whittle's ventilation strategy for single bedrooms is described in further detail in the Inquiry's Provisional Position Paper 2 on the Environmental Matrix.

18.24 According to a document entitled 'Design risks to the Board at Financial Close', the risks at 28 January 2015 included ventilation. The issue is not described, but it is given a 'high' risk impact. The current mitigation measures were stated to be:

- "The single room with en-suite ventilation design shall comply with the parameters set out in SHTM 03-01.
- The design solution should not rely in any way with the opening windows as these will be opened or closed by patient choice.
- The critical factor from SHTM 03-01 for infection control will be the resultant pressure within the room being balanced with or negative to the corridor.
- Isolation room ventilation shall comply with SHPN 04 Supplement 1."

18.25 The final position was stated as "TBC". No person was specified as being responsible for the closure of this risk.

18.26 The document contained an entry for "Design" where the issue was stated to be "Review of RDS content". The risk impact was stated to be "closed". The

comment given was “RDS have been submitted for Board Review”. No details are provided in relation to the review procedure or whether the room data sheets were deemed acceptable to NHSL. The final position was stated as “TBC” notwithstanding the fact that the Risk Impact was described as “closed”.

18.27 The document contained a further entry for “Design” where the issue was stated to be “RDS omitted by Project Co at FC”. The risk impact was stated to be “closed”. The comment given was “Board reviewing operational design notes to confirm if there are gaps for the omitted RDS”. The Final Position was stated as “TBC”.

18.28 A document titled ‘Technical Risks to the Board at Financial Close’, dated 30 January 2015 listed “…the principal high, medium and low technical risks…” for the project. It highlights a number of risks related to the unexpected and ‘significant’ quantity of RDD.”

18.28.1 One of the highlighted risks was “Less well defined proposals, therefore less certainty by the Board. Lack of design”. The mitigation measures employed up to financial close were “IHSL pushed very hard to achieve maximum information during PB stage. Further developed RDD schedule for Board”.

18.28.2 Another risk arising from the significant quantity of RDD was that “Board may not be able to respond in the allocated 15 days. Therefore the RDD item is deemed accepted.” The mitigation measures employed up to financial close were stated to be “Informal non-contractual design review meetings being held with IHSL. Process confirmed in Part 3 of Section 5 of Schedule Part 6 limiting Project Co’s ability to add RDD items with less than 4 weeks notice.” as well as “Internal resourcing/management meetings ongoing.” Required mitigation measures post financial close include, “The Board and Motts to resource RDD appropriately.” and “Manage Project Co’s rolling programme in accordance with Part 3 of Section 5 of Schedule Part 6.”

18.28.3 The document did not state whether the risks set out were high, medium or low.

18.29 A risk register report was shared with the PSB for its meeting on 30 January 2015. The risk register report does not mention the RDD items recorded in the document “technical risks to the Board at Financial Close” or the ventilation item recorded in the document “design risks to the Board at Financial Close” as risks. The risk register report contains an item nine ‘Specification Changes post Financial Close’ with the description: “Programme is delayed due to Board changing service and accommodation requirements.” Risk 25 and 45 are identical and relate to “service change”, specifically: “Planned function of a room/area becomes obsolete or priorities change due to changes in practice/advances in technology and requires updating before opening”. The controls in place for all three items included putting in place governance structures to manage the approval of change.

18.30 The risk register noted “programme delay in reaching Financial Close” as an amber risk. The controls in place included “Rigorous and resourced user group engagement and technical adviser input to progress detailed design and technical schedules…” The adequacy of the controls to minimise and achieve programme were described as:

“Not satisfactory at present…”

18.31 It is not clear to the Inquiry Team why the risk status had reduced given that the controls in place were still deemed to be unsatisfactory. This will require to be explored with witnesses at the diet of hearings commencing on 24 April 2023.

18.32 At the PSB meeting on 30 January 2015 Brian Currie introduced the risk report. He noted that “post-FC change would be inevitable”, that any changes would have cost and revenue implications, would lead to delay, and that “a governance process to manage the impact is required.” The decision-making

process for dealing with change was discussed. NHSL were working towards completion on 5 February 2015. Mr Currie noted that there was a requirement for the contract to be signed by 13 February 2015 due to the project sponsor's leave.

18.33 By financial close the issues that had been identified with the Environmental Matrix and TUV SUD/Wallace Whittle's design for single bedroom ventilation were not resolved. Room data sheets were incomplete, although draft room data sheets for generic and key rooms had been prepared. The ventilation specifications outlined in the Environmental Matrix as well as the Room Data sheets for Department B1 (Critical Care, HDU, Neonatal Surgery) were potentially inconsistent with SHTM 03-01, but this had not been identified by MM, NHSL or IHSL. This and other potential inconsistencies are described in further detail in the Inquiry's Provisional Position Paper 2 on the Environmental Matrix.

18.34 Room data sheets were included in Part 3 of Section 5 (Reviewable Design Data) and Schedule Part 6 (Construction Matters) of the Project Agreement (RDD Schedule). Part 3 included "Reviewable Design Data not provided to the Board nor approved by the Board at Financial Close" and was subject to the Review Procedure in Schedule Part 8 of the Project Agreement, "before such Reviewable Design Data is incorporated into the Facilities and/or the Site by Project Co". Furthermore, according to Part 3 of the RDD Schedule:

> "Following the date of this Agreement:
>
> - Project Co shall submit a programme of issue dates for Reviewable Design Data set out in this Part 3;
> - Project Co shall ensure that such programme shall show the items of Reviewable Design Data forecast to be submitted to the Board within the next 3 months;
> - Project Co shall revise and reissue the programme on a monthly basis so as to maintain a rolling 3 month look ahead from each date of issue

Project Co recognises this aspect of the Reviewable Design Data process is still to be agreed and further acknowledges the practicalities for the Board co-ordinating and undertaking the reviews of Reviewable Design Data. Project Co shall ensure that no changes to the first month of each revised 3 month programme shall be made without the prior approval of the Board, and the Board shall approve or reject any Project Co proposal for such a change within 5 Business Days of receipt of the Project Co proposal, failing which the Board shall be deemed to have approved the change.

Project Co shall take reasonable endeavours to sequence the release of information in a manner so as to mitigate the volume of parallel reviews required to be undertaken by the Board pursuant to the Review Procedure."

18.34.1 Also included in Part 3 of the RDD schedule were ventilation drawings: "1:200 Primary distribution for all areas indicating main distribution routes and plant locations with respect to…ventilation" and "1:50 Detail layouts for all areas for… ventilation", described previously.

18.34.2 The Environmental Matrix and Schedule of Accommodation were included in Part 4 of the RDD Schedule, which contained "Non-Approved Project Co's Proposals Design Data comments". They were subject to the review procedure under Schedule Part 8 of the Project Agreement. In relation to the Environmental Matrix, a number of Board comments were set out. These included a comment noting that a detailed proposal was awaited on bedroom ventilation to achieve balanced/negative pressure relative to corridor.

18.34.3 Part 4 of the RDD Schedule stated that:

"If Project Co considers that the comments below on any of the items listed in this Part 4 amount to a Change, Project Co shall, before complying with the comments and resubmitting the Endorsed RDD, notify the Board of the same and, if it is agreed by the parties or determined

pursuant to Schedule Part 20 (Dispute Resolution Procedure) that a Change would arise if the comments were complied with, the Board may, if it wishes, implement the Change and it shall be dealt with in accordance with Schedule Part 16 (Change Protocol)."

18.34.4 Part 4 contained a table which included a number of comments, the details of which are described in the Inquiry's Provisional Position Paper 2 on the Environmental Matrix.

18.34.5 Part 1 of the RDD Schedule contained "endorsed" RDD items that had been given Level A or Level B status, meaning that they could proceed subject to comments NHSL had made against each item. No items related to ventilation were included in Part 1.

18.34.6 As noted previously, IHSL's ventilation strategy drawings were included in Part 2 of the RDD schedule, which included "Non-Approved RDD Items" that had received Level C or Level D at financial close, meaning that Project Co could not proceed with construction in terms of that item until NHSL's comments had been incorporated and the drawing submitted to NHSL through the review procedure outlined in Schedule Part 8.

19. Full Business Case

19.1 The Full Business Case (FBC) required to be approved by both NHSL and the Scottish Government in order for the Project to achieve funding.

19.2 The purpose of the FBC is to:

- "identify the 'market place opportunity' which offers optimum Value for Money
- set out the negotiated commercial and contractual arrangements for the deal
- demonstrate that it is 'unequivocally' affordable

- put in place the detailed management arrangements for the successful delivery of the scheme”

19.3 The FBC includes:

- “Strategic Case: Strategic Case confirmed/updated
- Economic Case confirmed or updated
- Commercial Case:
  - Detail each procurement selection process
  - Confirm scope of procured works & services
  - Confirm main contractual arrangements
- Financial Case
  - Confirm financial implications of project and project & affordability
  - Stakeholder sign-off
- Management Case:
  - Confirm details of management arrangements outlined in OBC to demonstrate that organisation is ready & capable of proceeding to contract award & implementation”

19.4 According to the Scottish Capital Investment Manual NPD Guide Section 2: OJEU to Contract Award, the following commitments are expected at the end of the preparation of the FBC:

State of contract discussions at end of stage:	Fully developed contract drafts
Designer:	1:200 plans with key departments at 1:50
Design and construct sub-contractor, services sub-contractor and bidding consortium:	Final sign-off on draft contract, payment mechanism, performance regime and allocation of risks within consortium
Financial and Economic Standing/Funding:	Due diligence commences prior to submission of Full Business Case

19.5 Paragraph 7.9 states that:

> "It is expected that while the FBC is being considered for approval, the NHSScotland body and private sector partner will continue to work up the detailed contractual documentation and that due diligence on behalf of the financiers will be continuing. NHS bodies will be required to demonstrate that schemes are sufficiently close to financial close before FBC approval will be given."

19.6 The FBC was circulated in advance of the meeting of the Finance and Resources Committee on 9 July 2014. At the meeting, the committee agreed to approve the submission of the FBC with the recommendation that it would proceed to the Capital Investment Group of the Scottish Government Health and Social Care Directorate. SFT.

19.7 Version 1 of the FBC was approved by the Board of NHSL on 6 August 2014. The Capital Investment Group (CIG) was due to consider the FBC at their meeting on 26 August 2014.

19.8 The strategic context set out in the FBC had not changed since the Outline Business Case. The expected benefits of the new hospital included a reduction in healthcare associated infection through modern design, particularly single rooms with en-suite accommodation (paragraph 2.10.2). The FBC stated that design risk for the Project was allocated to Project Co and not NHSL (paragraph 4.1.3):

> "1) Design risk sits with Project Co, subject to the Project Agreement (Clause 12.5) and agreed derogations identified within the Board's Construction Requirements."

19.9 The FBC included the letters from MacRoberts and MM in relation to the conduct of the procurement exercise. The report by Ernst and Young was also included.

19.10 Paragraph 6.4.1 stated that:

> "Commissioning arrangements are outlined in the Project Agreement with IHSL, to ensure all aspects of construction conform to the relevant standards and comply with contractual requirements"

19.11 Paragraph 6.6 addressed risk management. Programme delay in reaching financial close was the only risk highlighted as red. No risks in relation to the design of key building systems, including the ventilation system, were recorded in this section of the FBC.

19.12 The FBC stated that the hospital was scheduled to open on 15 May 2017.

19.13 The Inquiry Team has been advised by NHSL that the process for approval of an FBC requires NHSL to submit the FBC several weeks in advance of the CIG meeting. The FBC is then circulated to members for review and comment. Questions from members are collated and sent back to NHSL, usually the week before the meeting. NHSL would then seek to respond to each question raised. This is not a resubmission of the FBC, but a process of clarification in response to specific points raised by members of the CIG.

19.14 For the Project, correspondence indicates that comments from the CIG members were passed to NHSL on 20 August 2014, and NHSL responded to those comments on 25 August 2014. None of the comments related to mechanical and electrical engineering..

19.15 The CIG meeting to discuss the FBC, including the points of clarification, took place on 26 August 2014. According to the minutes, the FBC for the RHCYP/DCN "was not approved at the meeting due to a number of outstanding comments." The comments that followed related to costs and unutilised space. The minutes then state, "Formal approval of this project to follow once queries had been resolved."

19.16 According to action notes of the PSB meeting held on 30 January 2015, "Finalisation of the financial model on 02/02/15 will trigger FBC approval by SGHSCD and key stage review completion by SFT – both are needed for financial close, and therefore critical to be completed by 04/02/15."

19.17 Funders required a letter confirming that the Scottish Government had agreed an award of revenue funding. SFT have advised the Inquiry Team that such a letter is a normal condition precedent set by funders to reach financial close. On 6 and 7 February 2015, Alan Morrison (Health Finance, SGHSCD), Iain Graham (Director of Capital Planning and Projects, NHS Lothian), Kerry Alexander (NPD Programme Director, SFT) and Andrew Orr (legal adviser, MacRoberts) discussed the content of the letter. At this point, the Pre-Financial Close Key Stage Review had not yet been completed, and the FBC had not yet been approved.

19.18 Mr Orr advised that if the letter stated that SG's approval of revenue funding "is subject to all issues highlighted in the Key Stage Review being satisfactorily concluded", funders would need something showing that these issues had been concluded. Mr Graham, was concerned to "get the balance right" in this letter by confirming approval of funding while not raising further questions about the Key Stage Review. Mr Graham suggested to use the wording "We will separately confirm the requirements for the Board to ensure satisfactorily conclusion of the Key Stage Review".

19.19 In terms of a letter dated 10 February 2015, Paul Gray (Director General for Health and Social Care at the Scottish Government) confirmed that the CIG had considered the FBC and had agreed an award of funding for the Project, and that "We will separately confirm the requirements for the Board to ensure satisfactorily conclusion of the Pre Financial Close Key Stage Review."

20. Key Stage Review 4: Pre-Financial Close

20.1 The Pre-Financial Close KSR was completed on 11 February 2015.

20.2 The KSR could only be completed once some issues in relation to ESA10 were resolved. Ernst & Young produced a report for the Board to satisfy SFT. Brian Currie commented on an earlier draft of the KSR and advised SFT that it was generally an accurate record of the project's status subject to some minor comments being provided.

20.3 Within the Key Stage Review report, under "Section 3: Project requirements" the following questions are asked:

> "Question 2: Is the Procuring Authority satisfied that the preferred bidder's solution satisfies its operational and functional requirements and delivers the project objectives, benefits and outcomes?"
>
> The answer provided was: "yes."
>
> The following comment was included in the KSR:
>
> "The detail of the design has been discussed with user groups to ensure clinical support and the Board confirms that it has received appropriate internal sign off."
>
> "Question 3: Please confirm the status of the technical documentation (i.e. design, construction and FM requirements). Is the Procuring Authority, and are its advisers, satisfied that further development/document production (if any) is achievable within the current project timetable?"
>
> The answer should have been answered with either "yes" or "no". The relevant box is left blank. The following comment was included in the KSR:

> “The Board has confirmed that the technical documentation is at a level of development consistent with the current stage of the Preferred Bidder to Financial Close programme. The Board advises that they are content with the documentation subject to further development through RDD following Financial Close and that the construction proposals are of sufficient detail to provide sufficient certainty to the Board as to what is to be provided and to permit a timely start on site. The Board has also confirmed that the FM Service Level Specification is agreed and that the FM Method Statements have been completed and agreed.”

20.4 It is not clear to the Inquiry Team why this statement was made. By financial close, the preferred bidder should have produced room data sheets for every room in the hospital. It is not clear why this requirement was waived by NHSL. This issue will need to be explored with witnesses at the hearing diet that commences on 24 April 2023.

20.5 SFT has advised the Inquiry Team that it did not undertake a design or technical assurance role and this element of the KSR was intended to prompt NHSL to reflect, with its advisers as necessary, on the stage of development of the technical solution and documentation at this critical stage.

20.6 NHSL has advised the Inquiry Team that they provided the above affirmative answers based on letters of support from its legal, financial and technical advisers.

21. Financial Close

21.1 Financial close is the end point of procurement when contracts are signed. After financial close, NHSL required to start making payments and construction could begin.

21.2 The target date for financial close was 3 October 2014 at tender stage. Financial close took place on 12 to 13 February 2015.

21.3 On 21 January 2015, in accordance with the minute of the Board of NHSL dated 6th August 2014, the Finance and Resources Committee formally resolved to delegate authority to the Chief Executive or Director of Finance of the Board of NHSL to approve the final terms of the NPD Project Agreement subject to:

> "(a) the approval of the final business case for the Project by the Scottish Government; and
>
> (b) the first full year Annual Service Payment at financial year 2014 prices not exceeding £17 million (excluding the effect of any movement in interest rates between now and financial close)."

21.4 Upon approval of those terms, there was formal authority to approve, sign, seal, execute, deliver and/or initial (as required) the documents required to reach financial close of the project.

21.5 Contract documents including the project agreement and all of the contracts setting out the financial arrangements, were signed on 13 February 2015 and 14 February 2015, marking financial close. After this date the Board began making payments to IHSL and IHSL required to commence construction.

22. Business Case Addendum

22.1 An addendum to a FBC can be required if there have been key movements in any material information about the project between FBC approval and contract signature. It is a practical process by which the financial position as identified in the FBC is updated. It does not require further consideration and/or recommendation by the CIG and the addendum is not referred for approval to the DGHSC.

22.2 An addendum to the FBC was approved by the NHSL on 1 April 2015. It was submitted to CIG on 7 April 2015, for noting. This was after the contract was signed and financial close had taken place.

22.3 The addendum notes that the project proceeded to financial close having adopted the contractual adjustments recommended by SFT to address the ESA 2010 accounting treatment to remain off balance sheet. ESA10 refers to the European System of National and Regional Accounts, new rules of which had implications for the accounting treatment of projects procured under the NPD model. Changes were made to the role of the public sector director with the introduction of an independent expert. The amendment was principally to the articles of association of the SPV with consequential minor changes in the Project Agreement. There was no change in the strategic case or the economic case for the Project as set out in the FBC. The financing arrangements are addressed in the addendum. Completion and handover of the new hospital was estimated at 25 July 2017 with the hospital due to open on 16 September 2017.

23. Provisional Conclusions

23.1 As outlined at the start, this paper seeks to set out the Inquiry Team's current understanding of the procurement process for the project. It is provisional in nature. The paper does not constitute any findings of the Chair of the Inquiry. It is open to any CP to seek to correct and/or contradict the contents of the paper. However, unless that is done, in addition to such other findings in fact that Counsel considers appropriate, the Chair is likely to be invited by Counsel to the Inquiry to make the following findings in fact at the conclusion of the hearing diet scheduled for April 2023.

23.1.1 NHSL conducted market testing prior to the commencement of the procurement exercise.

23.1.2 NHSL was satisfied that there was sufficient interest in the market for a new hospital that was to be funded by way of a NPD funding model.

23.1.3 The procurement exercise required to comply with the 2012 Regulations.

23.1.4 NHSL was the contracting authority for the purposes of the 2012 Regulations and had overall responsibility for the conduct of the procurement exercise and the content of documentation issued to prospective tenderers.

23.1.5 NHSL was assisted by technical advisers, including MM, in the production of the tender documents.

23.1.6 HFS was not called upon to advise on, or review, technical information related to the requirements of the ventilation system proposed for the new hospital prior to a preferred bidder being identified by NHSL.

23.1.7 SFT provided assistance to NHSL during the procurement process. Their role involved providing advice on the NPD procurement process and an 'oversight' role.

23.1.8 Concerns were raised by the Scottish Government as to whether it was appropriate for SFT to have this dual role. However, the procurement proceeded with SFT adopting this dual role.

23.1.9 The contract opportunity constituted a “particularly complex contract” for the purposes of the 2012 Regulations and NHSL was entitled to adopt the competitive dialogue procedure.

23.1.10 Three entities were invited to participate in dialogue. They were issued with the ITPD.

23.1.11 The ITPD followed the structure recommended by the SCIM.

23.1.12 The ITPD set out NHSL’s requirements, including the technical requirements for the ventilation system, and the procedure for assessment of tenders.

23.1.13 The assessment criteria adopted by NHSL was the “most economically advantageous tender”. The assessment was based on an assessment of price and quality. There was a 60/40 split in terms of price and quality.

23.1.14 A number of technical requirements were assessed on a pass/fail basis. The remainder were scored as part of the 40% weighting accorded to quality.

23.1.15 The available marks for mechanical and electrical engineering proposals were less than those available for interior design and architectural and landscaping design.

23.1.16 The competitive dialogue procedure involved a series of discussions taking place with prospective tenderers before tenderers were invited to submit final tenders.

23.1.17 During the competitive dialogue phase, NHSL required to clarify what it meant by ‘Operational Functionality’.

23.1.18 The project was assessed at various stages of the procurement process by way of ‘Key Stage Reviews’ (KSR). KSR were carried out by SFT.

23.1.19 KSR were aimed at ensuring the financial viability of the project. While technical issues were touched on in the KSR, it was not the purpose of the KSR process to undertake a detailed technical review of the specifications for the building systems in the new hospital.

23.1.20 NHSL and SFT had a desire to keep the procurement process as short as was reasonably practical.

23.1.21 NHSL utilised a reference design approach. This was made clear to prospective tenderers in the procurement documents including the ITPD and the ISFT.

23.1.22 CEL 19 (2010) made it a mandatory requirement for all NHS Bodies in Scotland engaged in the procurement of both new-build and refurbishment of healthcare buildings to use and properly utilise the England Department of Health’s Activity DataBase (ADB) as an appropriate tool for briefing, design and commissioning.

23.1.23 If ADB was deemed inappropriate for a particular project and an alternative tool or approach is used, the responsibility is placed upon the NHS Body to demonstrate that the alternative is of equal quality and value in its application.

23.1.24 NHSL did not produce ADB room data sheets and issue them to prospective tenderers.

23.1.25 An Environmental Matrix was produced which sought to set out NHSL’s technical requirements for the ventilation system.

23.1.26 Prospective tenderers required to submit some room data sheets as part of their tender. These were for key and generic rooms.

23.1.27 Both the ITPD and the ISFT stated that the entity appointed as preferred bidder would require to develop room data sheets for all spaces in the hospital before financial close.

23.1.28 ITPD Volume 1, Section 2.5.3 stated that tenderers were required to use the Environmental Matrix, and other 'Room Information' documents, to form the basis of Room Data Sheet production.

23.1.29 ITPD, Volume 3, Section 2.3 required tenderers to comply with SHTMs.

23.1.30 There was a lack of clarity in the procurement documents in relation to: (i) the purpose of the Environmental Matrix; and (ii) whether compliance with the Environmental Matrix was mandatory.

23.1.31 Following the close of competitive dialogue, three tenders were submitted. These included tenders by IHSL and Mosaic.

23.1.32 All three tenders were assessed as valid tenders that complied with all the technical requirements set by NHSL.

23.1.33 IHSL stated in its tender submission that its technical solution complied with SHTMs, HBNs and HTMs.

23.1.34 IHSL did not propose any changes to the Environmental Matrix.

23.1.35 One tenderer (Bidder C/Mosaic) did propose changes to the Environmental Matrix including to air changes per hour in critical care rooms.

23.1.36 Bidder C had stated during competitive dialogue that it would make changes to the Reference Design in a variety of situations, including where there was non-compliance with relevant design guidance.

23.1.37 Both IHSL's tender and Mosaic's tender were assessed by NHSL as complying with NHSL's published requirements. This assessment was made notwithstanding the fact that IHSL and Bidder C/Mosaic were offering to provide different technical requirements in terms of the Environmental Matrices submitted.

23.1.38 Given the disconnect between the values in the Environmental Matrix (issued with the ITPD) and SHTM03-01, it is not clear why IHSL's tender was deemed by NHSL to comply with the published requirements.

23.1.39 The assessment panel noted that IHSL's tender:

> "lacked detail on design philosophy and BCR compliance".

23.1.40 The Pre-Preferred Bidder KSR recorded (in section 2, Question 3) that:

> "The Board has confirmed that all bidders have provided detailed programmes to cover the activities for the period until FC and that the development of the technical information is at least as advanced as the Board anticipated at this stage. The Board and its advisers are satisfied that any further development of technical information from PB appointment to FC is achievable within the current project timetable"

23.1.41 A risk register was set out in Annex B of the Pre-Preferred Bidder KSR. It noted "Programme delay in reaching Financial Close" as a "red" risk. The risk register recorded that "Adequacy of Controls" was "Not satisfactory at present".

23.1.42 IHSL's tender was assessed as the most economically advantageous tender.

23.1.43 MacRoberts advised NHSL that the procurement process had complied with the 2012 Regulations and best practice.

23.1.44 SFT confirmed to NHSL that the processes and procedures of SFT had been followed.

23.1.45 MM advised NHSL that from a technical perspective the evaluation had been carried out in a manner consistent with the evaluation methodology. Accordingly, it was appropriate for NHSL to conclude the evaluation process and appoint the preferred bidder.

23.1.46 The advice of MM, MacRoberts and SFT was relied on by the Finance and Resources Committee of NHSL in determining to recommend that IHSL be appointed as preferred bidder.

23.1.47 IHSL was appointed as preferred bidder.

23.1.48 In the period from the appointment of IHSL as preferred bidder to financial close, NHSL agreed to waive the requirement (stated in both the ITPD and ISFT) that room data sheets for all spaces in the hospital would be completed by financial close.

23.1.49 By financial close, IHSL had completed room data sheets for less than half the spaces in the hospital.

23.1.50 The draft project agreement contained a concept of “reviewable design data”. Technical issues not agreed by financial close became “reviewable design data” under the project agreement.

23.1.51 Prior to a contract being signed between NHSL and IHSL, a dispute arose in relation to air change rates, and pressure regimes, in certain bedrooms.

23.1.52 Discussions took place between NHSL, MM and IHSL in relation to the issues concerning environmental parameters in certain bedrooms. IHSL made it clear to NHSL that its proposal for ventilation was “mixed mode” and relied on natural ventilation for certain spaces in the hospital.

23.1.53 No issues were escalated by NHSL to the Scottish Government in relation to the proposed ventilation system for the new hospital before financial close.

23.1.54 Prior to the conclusion of the contract, no issues were raised by NHSL or MM in relation to the requirements of the ventilation system for critical care areas proposed by NHSL.

23.1.55 Question 3 of the Pre-financial close KSR was in the following terms:

> "Please confirm the status of the technical documentation (i.e. design, construction and FM requirements). Is the Procuring Authority, and are its advisers, satisfied that further development/document production (if any) is achievable within the current project timetable?"

23.1.56 The answer should have been answered with either "yes" or "no". The relevant box was left blank. The following comment was included in the KSR:

> "The Board has confirmed that the technical documentation is at a level of development consistent with the current stage of the Preferred Bidder to Financial Close programme. The Board advises that they are content with the documentation subject to further development through RDD following Financial Close and that the construction proposals are of sufficient detail to provide sufficient certainty to the Board as to what is to be provided and to permit a timely start on site. The Board has also confirmed that the FM Service Level Specification is agreed and that the FM Method Statements have been completed and agreed."

23.1.57 As at August 2014, NHSL had concerns about the project programme.

23.1.58 As at November 2014, NHSL had concerns about the quality of the information provided by IHSL in relation to the Project.

23.1.59 Prior to signing any contract with IHSL, NHSL was aware that there was significantly more “reviewable design data” than had originally been planned for the Project.

23.1.60 A contract was concluded between NHSL and IHSL, and financial close achieved, in February 2015.

23.1.61 NHSL entered into a contract with IHSL which stipulated that the environmental matrix would be “Reviewable Design Data” under the contract. Therefore, the precise parameters for the ventilation system would be worked out after the contract was concluded.


SCOTTISH
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INQUIRY

Draft Provisional Position Paper on the Project Agreement

SCOTTISH HOSPITALS INQUIRY

VERSION: 23 JANUARY 2023

Purpose of the Paper

1. This Provisional Position Paper concerns the Project Agreement dated 12 and 13 February 2015 between Lothian Health Board ("the "Board") and IHS Lothian Limited for the construction of the new Royal Hospital for Sick Children, the Child and Adolescent Mental Health Service and the Department of Clinical Neurosciences at Little France, Edinburgh ("RHCYP/DCN"). The contract is referred to in this paper as "the Project Agreement".

2. It has been produced to assist the Chair in addressing the Terms of Reference. It outlines the Inquiry Team's understanding of the key provisions of the Project Agreement which bear, or may bear, on the building system which the Inquiry's investigations have thus far focused upon: the ventilation system.

3. The Inquiry Team are likely in due course to invite the Chair to make findings which take account of the understanding of the Project Agreement set out in this paper. The paper is therefore being circulated to Core Participants for consideration and comment. It is open to any Core Participant to make comments or provide information to supplement or challenge any of the contents of this paper.

It is therefore possible that the Inquiry's understanding of matters set out in the paper may change, so the position set out in this paper remains provisional. If it is the case that the Inquiry Team's understanding does change significantly, a revised edition of this paper may be published in due course.

4. It is no part of the Inquiry's function to rule on any person's civil liability (section 2(1) of the Inquiries Act 2005): that is a matter for the courts. The Inquiry's purpose in setting out the terms of the Project Agreement is not therefore to lead up to any determination about the correct interpretation of the contract or any liabilities under it. The purpose is rather to understand the agreement that the parties reached as the culmination of the procurement process and as the basis for the works, insofar as those matters bear upon the Terms of Reference.

Contents

Introduction

5. The Project Agreement was the contract by which the Board engaged IHS Lothian Limited (referred to as "Project Co" in this paper, to reflect the terminology of the Project Agreement) to construct and deliver the RHCYP/DCN. It sets out the specification which the Board required and which Project Co undertook to deliver. As one would expect of a contract for such a project, it is long and detailed[1].

6. The Project Agreement is the culmination of the procurement phase, and the basis for the works. It is an important stage in the sequence of events between the preparatory stages of the project and any defects which arose later. An understanding of it is therefore an important foundation for investigating these matters.

7. The Project Agreement provides at least two measures by which the Inquiry may determine that building systems were defective:

   a) If the works delivered by Project Co failed to meet the contractual specification; and

   b) If the contractual specification was itself deficient, measured against other applicable standards or what the Board intended to achieve.

General comments

8. This paper aims to identify all parts of the Project Agreement of potential relevance. Many of these may turn

[1] Even the parts to which this note is confined extend to over 6,000 pages.

out to be of no, or merely contextual, relevance. By including these provisions in the appendices, the hope is that they will serve as a useful point of reference and that repeated re-reading of the Project Agreement will be unnecessary. If CPs consider that any relevant sections have been omitted – or irrelevant sections included – it would be helpful for details to be provided to the Inquiry.

9. The paper necessarily paraphrases parts of the agreement, and in quoting from it removes text from its context. As with any contract, the context may be important to meaning. Where a precise understanding is needed, reference should be made to the Project Agreement itself.

10. The Project Agreement has many schedules and appendices (which themselves often have schedules and appendices). It does not appear to exist as a single-source document; the Inquiry certainly does not hold it as such. Its various parts exist as different electronic files. This complicates the task of reading it. The Inquiry is in the process of establishing an easily consulted, authoritative set of the relevant parts.

Project Agreement: core provisions on design and construction

11. The core clauses on design and construction are set out in Part 3 of the main body of the Project Agreement (clauses 12 to 19).

12. Clause 12.1 provides:

> *"12.1 Project Co shall carry out the Works:*

12.1.1 so as to procure satisfaction of the Board's Construction Requirements;

12.1.2 in accordance with Project Co's Proposals; and

12.1.3 in accordance with the terms of this Agreement.

13. Clause 12.2 provides that the obligations in clauses 12.1.1 to 12.1.3 are independent obligations which must each be complied with. Compliance with one is not a defence to non-compliance with another.

14. Under clause 12.7, Project Co were obliged at their own expense to amend Project Co's Proposals, and rectify the Works, if those proposals did not fulfil the Board's Construction Requirements. The Board's Construction Requirements, accordingly, took precedence over the Project Co's Proposals to the extent they were in conflict.

15. The Board's Construction Requirements are in section 3 of Schedule Part 6 (Construction Matters) of the Project Agreement. Project Co's Proposals are in section 4. These sections are both lengthy and detailed. Potentially relevant details from them are set out more fully in Appendices 1 and 2.

16. Two sources understood by the Inquiry to be of particular importance to the potential deficiencies in the ventilation system are the Room Data Sheets and the Environmental Matrix. The Board's Construction Requirements required compliance with both of these:

    a) Compliance with the Environmental Matrix was required by paragraph 8 of the Board's Construction

Requirements (under the heading "*Mechanical & Electrical Engineering Requirements*");

b) Compliance with room data sheets was required by paragraph 3.6.3 of the Board's Construction Requirements (under the successive headings "*General Design Requirements"*, *"Spaces"* and *"Room Data Sheets*").

17. That compliance with the Environmental Matrix was a requirement of the Board may be significant when considering the difficulties that later arose. It may have contributed to its ambiguous status: it was simultaneously a requirement of the Board and (as discussed further below) both an item of Reviewable Design Data which it was Project Co's responsibility to revise, and (at least in the eyes of the Board) an item of Disclosed Data for which, under the Project Agreement, the Board carried no responsibility.

18. It may also be important to note that Project Co's obligation to comply with the Board's Construction Requirements was subject to derogations specified in Project Co's Proposals.[2] These included derogations about both the Environmental Matrix and about Mechanical Ventilation and Air Conditioning.[3] The derogation relating to the Environmental Matrix states: "*Anomalies within the environmental matrix have been reviewed and proposals incorporated within the room data sheets (refer to schedule for proposed variations). This shall be further developed in conjunction*

[2] Schedule Part 6 (Construction Matters) Section 3 (Board's Construction Requirements) at paragraph 2.7.

[3] Schedule Part 6 (Construction Matters) Section 4 (Project Co's Proposals) Disc 1 at section 4.31 (pages 3859 and following). The entries concerning the Environmental Matrix and Mechanical Ventilation appear at pages 3884 and 3886 respectively.

with the board on the basis of the schedule of comments contained in Section 5 (RDD) Part IV." [4] The derogation relating to Mechanical Ventilation and Air Conditioning provides, inter alia, that "*Air Handling Units for Theatres, Critical Care and High Dependency Unit areas to be fitted with space for future humidification. (In compliance with SHTM03-1)*". It may be relevant for the Inquiry to consider the extent to which these derogations took compliance with the Environmental Matrix outside of Project Co's obligations.

19. "*Environmental Matrix*" is defined in the Board's Construction Requirements as:

> "*the Environmental Matrix, which details the room environmental condition requirements of the Board required within each department / unit / space / area as set out in Section 6 (Room Data Sheets) of Schedule Part 6 (Construction Matters) (as varied, amended or supplemented from time to time in accordance with the Project Agreement)*" (Schedule Part 6 (Construction Requirements) Section 3 (Board's Construction Requirements) Sub-Section B (Definitions and Abbreviations).

The definition therefore anticipated development of the Environmental Matrix from the version appended to the Project Agreement. This development was to take place through the contract review procedure, with the

[4] This is apparently a reference to Schedule Part 6 (Construction Matters) Section 5 (Reviewable Design Data), Part 4. As discussed elsewhere in this note, that section sets out Reviewable Design Data which was unapproved at Financial Close and the subject of comment by the Board. That category of Reviewable Design Data included the Environmental Matrix, and comments about it are listed in Part 4.

Environmental Matrix forming part of the Reviewable Design Data (as discussed below).

20. The Environmental Matrix, as it stood at financial close, was contained in the Project Agreement (Appendix 2 to Section 6 of Schedule Part 6).

21. For Room Data Sheets, the requirement of the Board's Construction Requirements was for Project Co to provide Facilities that, as a minimum, met all the requirements of the room data sheets contained in the Project Agreement (Appendix 1 to Section 6 of Schedule Part 6). Insofar as room data sheets were not included there, Project Co were to provide them as Reviewable Design Data (paragraph 3.6.3). The Room Data Sheets appended to the Project Agreement were not, therefore, a complete set for the construction of the hospital.

22. The Board's Construction Requirements also required compliance with CEL 19 (2010) "A Policy for Design Quality for NHS Scotland, 2010 revision (e.g., Section 3 of Schedule Part 6, paragraphs 2.1, 2.2(b) and 2.3(b)). This mandated the use of the Department of Health's Activity DataBase (ADB) as an appropriate tool for briefing, design and commissioning, but noted that care was needed to ensure compliance with Scottish-specific guidance such as SHTMs. ADB was a source of room data sheets which automatically complied with English guidance (including HTMs).

23. By clause 12.3, Project Co warranted the use of reasonable skill and care in the design of the Facilities.

24. By clause 12.5, the Board confirmed, subject to qualifications, that those parts of Project Co's Proposals which it had initialled satisfied its requirements in respect of Operational Functionality.[5] This implies the existence of a set of Project Co's Proposals initialled by the Board. It is not clear where this set is to be found. The Project Co's Proposals forming part of the Project Agreement at financial close do not, with the exception of a few plans, bear to have been initialled by the Board.

25. Clause 12.6 provided that Project Co were to develop and finalise the design and specification of the Works, and that the Board were to review the Reviewable Design Data. The procedure to be followed for that review is set out in Schedule Part 8 (Review Procedure) and clause 12.6. Project Co's obligation to develop and finalise the design and specification was not confined to Reviewable Design Data: the concept of Reviewable Design Data existed to define those aspects of the design and specification which the Board was to review and approve before it could form an approved basis for construction.

[5] "*Operational Functionality*" has a lengthy definition in Schedule Part 1 which is essentially concerned with: access to the Site and Facilities; the relationship and adjacencies between different parts of the Facilities; the quantity, description and dimensions of rooms and spaces; the locations and relationship of equipment, furniture and fittings; all insofar as they relate to or affect Operational Use. "*Operational Use*" "*means the use of a room or space to the extent that it is used by the Board or its employees, tenants, agents and/or contractors … for carrying out the Board Services"*. "*Board Services*" is defined as including various uses, most importantly the Clinical Services and the Non-Clinical Services. "*Clinical Services*" includes most importantly the carrying out of clinical and medical services at the Facilities. "*Non-Clinical Services*" includes related functions such as catering, cleaning, laundry and waste processing. It seems unlikely that the issues surrounding ventilation fell within the scope of Operational Functionality, but it is perhaps arguable: for example, the pressure gradients between adjacent rooms might fall within "*the inter-relationships between rooms"* at leg (e) of the definition. In other words, on this view, it was for the Board to know how neighbouring rooms were to be used for their clinical services, and to determine if Project Co's Proposals (including for ventilation) satisfied those needs. This is a point which the Inquiry may wish to keep under review.

26. "*Reviewable Design Data*" is defined as "*the Design Data*[6] *listed at Section 5 (Reviewable Design Data) of Schedule Part 6 (Construction Matters)*" (Schedule Part 1: Definitions and Interpretation).

27. Section 5 (Reviewable Design Data) is discussed in more detail in Appendix 3. It divides the Reviewable Design Data into four categories. Data within each category was to be submitted to the Board under the contractual review procedure established by clause 12.6 and schedule Part 8.

28. The first two categories of Reviewable Design Data (set out in parts 1 and 2 of Section 5) concerned data which the Board had already reviewed, and had either approved subject to comments or not approved. For these categories, Project Co was to take account of the comments and resubmit the data to the Board under the review procedure.

29. The third category of Reviewable Design Data (set out in part 3 of Section 5) was data which had yet to be submitted to the Board. This category of data appears extensive, and includes elements likely to be relevant to the Inquiry, including: Room Data Sheets (item A1); detailed specifications for all mechanical and electrical components (item A14); details for the control of infection (item A45); air handling systems (item H8); and ventilation (items I3 and I4). Part 3 of Section 5 made provision for a programme of issue dates for this category of Reviewable Design Data, and acknowledged that that aspect of the process was still to be agreed. It includes an acknowledgment by Project Co of the practicalities for the Board in co-ordinating and

[6] "*Design Data*" is also a defined term, but it is not clear that the precise detail of that broad definition has any material significance for the Inquiry.

undertaking the reviews of the Reviewable Design Data; and provided that *"Project Co shall take reasonable endeavours to sequence the release of information in a manner so as to mitigate the volume of parallel reviews required to be undertaken by the Board pursuant to the Review Procedure*". This appears to be recognition that the volume of Reviewable Design Data which, at financial close, was yet to be reviewed by the Board was substantial enough that its production and submission had to be managed to facilitate the Board's review of it.

30. The fourth category of Reviewable Design Data is set out in part 4 of Section 5. It concerned parts of Project Co's Proposals which the Board had not approved and on which it had made comments. It is not immediately obvious what distinguishes this category from the one set out in part 2. The language of this part is not particularly clear. The Board's comments were again to be taken into account and the data resubmitted to the Board under the review procedure. This category of data included the Environmental Matrix. Certain comments attributed to the Board were listed, and Project Co were to update the Environmental Matrix to reflect them. One of the comments required the updated Environmental Matrix to "*reflect all the rooms and room types in the proposed Facility*" to be based upon "*an updated Schedule of Accommodation that has been commented on separately by the Board*". The Schedule of Accommodation was itself an element of Reviewable Design Data in this category, in relation to which it was provided that "*Project Co shall update the Schedule of Accommodation to reflect all of the individual elements of the proposed Facilities in accordance with*

Good Industry Practice".[7] This indicates that the schedule of accommodation for the hospital was yet to be completed at financial close, and that it had to be completed before the Environmental Matrix could be.

31. The provisions of the contractual review procedure, especially those in Schedule Part 8, are difficult to summarise.

32. In broad terms, and at the risk of over-simplifying what are intricate provisions, the contract required Project Co to submit Reviewable Design Data to the Board for approval. Until that approval was given, Project Co was prohibited from carrying out construction based upon that data, although it had a limited right to proceed at its own risk if it was challenging the Board's non-approval as based on incompetent grounds (clause 12.6.1). The Board was entitled to withhold approval (by making comments or objections) on only limited grounds (Schedule Part 8, paragraphs 3.1 and 3.3). Project Co was obliged to comply with the Board's comments and objections unless it successfully challenged them as going beyond the limited grounds (schedule Part 8, paragraph 4.3).

33. The review process for Reviewable Design Data, and the Board's response within it, had only a limited impact on the allocation of design risk: in short, the Board's approval to proceed was taken as confirmation that the approved design satisfied its requirements for Operational Functionality (clause 12.6.2, Schedule Part 8 paragraph 4.5, and Table A in Appendix 1 of Schedule Part 8). The effect

[7] The Project Agreement does not define "*Schedule of Accommodation*", but a document with that title forms part of Project Co's Proposals (Schedule Part 6, Section 4, Disc 1, pages 150 to 241).

of approval by the Board under the review procedure was therefore to put Reviewable Design Data into the same category, for the purposes of risk, as those parts of Project Co's Proposals which the Board had initialled prior to financial close: both would then be treated as having satisfied the Board's requirements for Operational Functionality (clause 12.5).

34. The Inquiry Team is proceeding on the understand that, to the extent the Room Data Sheets and Environmental Matrix were Reviewable Design Data[8], they did not form an approved basis for construction; were subject to Project Co's obligation to develop and finalise the design and specification of the Works; and would only become an approved basis for construction once they had been reviewed by the Board and approved as meeting their requirements for Operational Functionality.

35. Under Schedule Part 8, the Board had 15 business days in which to comment on any item of Reviewable Design Data submitted to it for review (paragraph 1.2), failing which the Board were deemed to have endorsed it as "Level A – no comment" (paragraph 1.2.2), in which event Project Co were bound to comply with it or implement it (paragraph 4.1).

36. The review process entitled the Board to raise objections on grounds wider than Operational Functionality (Schedule

[8] There is perhaps room for debate over whether the Room Data Sheets and Environmental Matrix were Reviewable Design Data in their entirety, or only to a more limited extent. That is a matter of contractual interpretation, in particular of Section 5 of Part 6 of the Schedule. As a provisional view, they were not Reviewable Design Data in their entirety, but only to the extent set out in Section 5 of Part 6 of the Schedule.

Part 8, paragraph 3; in particular, paragraphs 3.1 and 3.3[9]). The review process may therefore have presented the Board with an opportunity to detect deficiencies in the design such as (for example) non-compliance with ventilation standards. It may be relevant to consider whether this was realistic, having regard to the contractual timescales for review by the Board and Project Co's general liability for the design.

37. The point of contact for the review process within the Board was "*the Board's Representative*", being the person appointed under clause 8 (that is, Brian Currie, unless any other person was appointed: clause 8.1).

Independent Tester and Commissioning

38. Clause 15.1 of the Project Agreement noted that the parties had "*appointed a suitably qualified and experienced consultant to act as the Independent Tester*". Clause 15.3 required them to comply with the Independent Tester Contract (a form for which was set out in Schedule Part 13). The Independent Tester was defined as EC Harris LLP or its substitute.

39. Clause 17 made provision for pre-completion commissioning and for completion. The Independent Tester's activities under clause 17 were triggered, under clause 17.5, by notification from Project Co that they

[9] Under paragraph 3.3.3(b), the Board were entitled to raise objections or make comments on the ground that the submitted item was "*inconsistent with the guidance contained in any current NHS Requirement which is applicable to a room of that function provided that such guidance has not been superseded by and is not inconsistent with any other provisions of the Board's Construction Requirements …"*. Any reliance on this provision would therefore have had to confront the question of whether or not the BCRs imposed a requirement inconsistent with SHTM 03-01. As explained elsewhere in this note, that may be a difficult question to resolve.

considered the Works would be complete in not less than three months.

40. By clause 17.7, Project Co were to undertake Project Co's Pre-Completion Commissioning. Clauses 17.8 to 17.10 made provision for the involvement of the Independent Tester and the Board in that process.

41. The commissioning activities were to be described in a Final Commissioning Programme to be agreed by the parties under clause 17, but to be based upon the Outline Commissioning Programme (at Appendix 3 of Schedule Part 10).[10]

42. By clause 17.11, provision was made for the Independent Tester to give notice of any outstanding matters requiring to be attended to for the Works to be complete.

43. Clause 17.12 made provision for the Independent Tester to issue a Certificate of Practical Completion when satisfied that the Facilities and the Retained Estate Handback Infrastructure were complete in accordance with the Completion Criteria.

44. The Completion Criteria were the Completion Tests defined in Appendix B of schedule Part 10. These are numerous, and included demonstration by Project Co that various criteria had been achieved. These criteria included that all

[10] This Appendix is described in the conformed copy of the Project Agreement as being "*set out on the disc in the Agreed Form identified and executed as the Appendix C (Outlook Commissioning Programme) of Schedule Part 10 (Outline Commissioning Programme) of this Agreement*". That document has not been considered in the preparation of this paper.

mechanical and electrical Plant[11] and systems had been tested and commissioned, and operated satisfactorily in accordance with specified design criteria and the Room Data Sheets (paragraph 2.1.4); that Project Co had provided documentation to the Independent Tester (paragraph 2.1.23); that a final draft Operational Manual had been made available to Project Co containing all testing and commissioning information (paragraph 2.1.24); that specified areas complied with the requirements of paragraph 8.60 of SHTM 03-01 for conventional operating rooms (paragraph 2.1.31); that Project Co had supplied completed Room Data Sheets "*for all rooms and areas in the Facilities including the environmental data contained in the Environmental Matrix*" (a second paragraph 2.1.31); that "*Project Co shall provide Environmental Matrix including Commissioning data test sheets as commissioned in accordance with CIBSE Commissioning Code C and demonstrating compliance with the Environmental Matrix*" (paragraph 2.1.32). It may be relevant in this context to recall that CEL 19 (2010) mandated the Department of Health's Activity DataBase (ADB) as a tool for commissioning as well as briefing and design.

45. By clause 17.13, the issue of the Certificate of Practical Completion was, in the absence of manifest error, bad faith or fraud, conclusive evidence, for the purpose of ascertaining the Payment Commencement Date, that the Facilities and the Retained Estate Handback Infrastructure were complete in accordance with the Completion Criteria. The Independent Tester was to issue the certificate

[11] Defined as "*the infrastructure systems, building systems, fixed, and immovable equipment systems, installed as part of the Works or pursuant to a Board Change as replaced from time to time*".

notwithstanding that there were Snagging Matters[12] (clause 17.14); and the issue of the certificate in no way affected Project Co's obligations under the agreement (clause 17.7). The date of the practical completion certificate (if after the Completion Date, as defined) was the Actual Completion Date and also the Payment Commencement Date, which marked the start of Project Co's entitlement to Monthly Service Payments (clause 34.1). The issue of a practical completion certificate appears, therefore, likely to have been financially significant for the parties.

46. Clause 18 made provision for Project Co and the Board to undertake and complete the Post-Completion Commissioning. On its completion, the Independent Tester was to issue the Commissioning Completion Certificate (clause 18.4).

47. Project Co were to provide the Board's Representative with an operation and maintenance manual sufficient for the safe and efficient use of the Facilities. The final version was to be supplied ten business days after the Actual Completion Date, with provision for drafts to be given at least 24 weeks beforehand (clause 18.5).

Disclosed Data

48. In his witness statement for the Inquiry's hearings in May 2022[13], Brian Currie (NHSL's Project Director for the RHCYP project) referred to the Environmental Matrix issued to bidders during the procurement of the Project Agreement,

[12] Defined as "*minor items of outstanding work … which would not materially impair the Board's use and enjoyment of the Facilities … or the carrying out by the Board of the Board Services or the performance of the Services by Project Co …*".

[13] Paragraphs 41 and following.

as part of the documentation issued with the Invitation to Participate in Dialogue (ITPD). He explained his understanding that it was an indicative element of the reference design, issued to bidders for information only. He also explained his view that it constituted Disclosed Data and was therefore subject to the provisions of clause 7.2 of the Project Agreement.

49. Clause 7 of the Project Agreement contains a range of provisions protecting the Board from liability or responsibility for Disclosed Data. Under clause 7.1, the Board was not to be liable to Project Co for losses arising from the use of the Disclosed Data; clause 7.2 provided that the Board gave no warranty in respect of the Disclosed Data, and was not to be liable to Project Co for any failure to inform it of any inaccuracy, error, omission, defects or inadequacy in the Disclosed Data; and under clause 7.3, Project Co confirmed it had conducted its own analysis of the Disclosed Data, had satisfied itself as to the accuracy, completeness and fitness for purpose of any of it on which it placed reliance, and was not to make any claim (including for extensions of time or additional payment under the Project Agreement) on the grounds of misunderstanding or misapprehension in respect of the Disclosed Data, or that incorrect or insufficient information relating to Disclosed Data had been given to it.

50. The Project Agreement defines "Disclosed Data" as "*any Design Data and any other written information, data and documents made available or issued to Project Co or any Project Co Party in connection with the Projects by or on behalf of the Board (or any Board Party) whether on, before or after the execution of this Agreement*" (schedule Part 1).

51. "Design Data" is defined as "*all drawings, reports, documents, plans, software, formulae, calculations and other data relating to the design, construction, testing and/or operation of the Facilities and/or the Retained Estate Handback Infrastructure"* (ibid.).

52. That language is broad enough to include the Environmental Matrix as Disclosed Data (as a "*document … relating to the design … of the Facilities*").

53. However, to the extent that compliance with the Environmental Matrix is a board requirement (paragraph 8 of the Board Construction Requirements at Section 3 of Part 6 of the Schedule), it may be thought that its status or otherwise as Design Data is beside the point: it would still mark the specification which Project Co was required (and entitled) to deliver.

54. An alternative view is that the Environmental Matrix supplied by the Board at financial close constituted Disclosed Data; but was (at least to some extent) subject to revision by Project Co as Reviewable Design Data; and that it was the Environmental Matrix as revised by Project Co, and approved by the Board as meeting its Operational Functionality requirements, which ultimately constituted the requirement of the Board. Whether or not the ventilation issues which later arose derived from a part of the Environmental Matrix which was Reviewable Design Data, or from a part which was not, is a question which the Chair may require to keep in mind.

Dispute Resolution

55. Except where expressly provided otherwise, disputes arising out of the Project Agreement were to be resolved in accordance with the procedure in Schedule Part 20 (Dispute Resolution Procedure) (clause 56). That Schedule contains conventional dispute resolution provisions.

56. Clause 54.7 prohibited the parties from terminating the Project Agreement for breach of contract save as expressly set out in it.

57. Clause 59 required each party to take all reasonable steps to minimise and mitigate any loss for which it was entitled to bring a claim against the other.

Miscellaneous

58. Clause 67.1 is an entire agreement clause, confirming that the agreement "*supersedes all prior representations, communications, negotiations and understandings concerning the subject matter of this Agreement*".

59. Clause 70 provided that the Project Agreement was to prevail in the event of any conflict between it and the Project Documents (a term which, as defined, included the Construction Contract, the Design Team appointments and the Key Sub-Contractor appointments).

60. Clause 72 obliged the parties to "*do all things and execute all further documents necessary to give full effect to this Agreement*".

61. The Project Agreement is governed by Scots law and (subject to the provisions of the Dispute Resolution

Procedure in Schedule Part 20) any dispute arising in connection with it is subject to the exclusive jurisdiction of the Scottish courts (clause 74).

62. Provision is made for definitions and interpretation in Schedule Part 1, sections 1 and 2.

Schedules

63. The Project Agreement has a Schedule in 32 parts. The parts of most relevance to the Inquiry are considered in more detail in the Appendices to this paper. They are:

Board's Construction Requirements (Schedule Part 6 (Construction Matters) Section 3)	Appendix 1
Project Co's Proposals (Schedule Part 6 (Construction Matters) Section 4)	Appendix 2
Reviewable Design Data (Schedule Part 6 (Construction Matters) Section 5)	Appendix 3
Room Data Sheets (Schedule Part 6 (Construction Matters) Section 6 Appendix 1)	Appendix 4

64. The Environmental Matrix (which appears at Schedule Part 6 (Construction Matters) Section 6, Appendix 2) is the subject of Provisional Position Paper 2 and is not therefore considered in detail in this paper.

65. This section of the paper considers other parts of the Schedule which may be of relevance to the Inquiry's Terms of Reference.

Schedule Part 3 (Key Works Personnel)

66. This identified Project Co's Key Project Personnel. These included the following: Alasdair Fernie (Project Director (Construction)); Liane Edwards-Scott (Design Lead (Construction)); and Stewart McKechnie (Lead M&E Engineer (Construction)).

Schedule Part 6 (Construction Matters) Section 7 (Thermal and Energy Efficiency Testing Procedure)

67. This sets out the tests to be carried out during the Final Commissioning Period to ensure the completed Facilities comply with the agreed Energy Performance. If energy efficiency requirements for the building had an influence on the ventilation specification, it may be relevant to consider this further.

Schedule Part 6 (Construction Matters) Section 8 (*Quality Plans (Design and Construction)*)

68. The text in the conformed copy of the Project Agreement provides: "*The Quality Plans (Design and Construction) are the Quality Plans (Design and Construction) as set out in Section 4.20 (Quality Plan) of Section 4 (Project Co's Proposals) of Schedule Part 6 (Construction Matters).*"

69. These appear at page 2058 of Project Co's Proposals. They are potentially relevant in setting out aspects of the process of design development, including in relation to mechanical and electrical engineering, after financial close.

70. The Construction Quality Plan (from page 2061) is the method by which Project Co was to manage the day-to-day

operation of the construction throughout the Construction Phase. It provided, inter alia, for the development of a Design Management Manual (page 2062); confirmed that responsibility for design management lay with the Project Manager (page 2066) and that there was a separate Design Manager (page 2067); noted the lead designers as including Wallace Whittle (Mechanical & Electrical) and Mercury (M&E Engineering) (page 2070); noted that each designer was to produce a quality plan (page 2071); confirmed that Project Co would procure management of the design through the schedule part 8 review procedure[14] in accordance with the Design Management Manual (pages 2071, 2072); noted, in relation to project requirement inputs for the design, that "*[t]he designers are required to review these inputs for adequacy in terms of completeness, and the avoidance of ambiguity and conflict with each other*" (page 2072); noted, in relation to design outputs, that they were to be provided in a form that enabled verification against the design input (ibid.); provided for design validation to ensure the resulting product was capable of meeting the requirements for the specified application or intended use (page 2073); and provided that "*[i]n the case of mechanical and electrical installations, the subcontractor will be required to commission the installed works with supported documentation in accordance with the contract conditions and the specification"* (page 2075).

71. At Appendix 1, a Quality Policy appears (page 2083). It includes the following statements: "*Project Co is committed to designing and constructing buildings that meet the specified standards. We place a top priority in working*

[14] That procedure applied to the review of Reviewable Design Data.

closely with our clients to gain a clear understanding of requirements … . We believe that getting it right first time is critical to the success of the business. …".

Schedule Part 6 (Construction Matters) Section 9 (Board's Qualifications / Comments in Respect of Operational Functionality Requirements)

72. These do not appear in the Conformed Copy of the Project Agreement held by the Inquiry, but were supplied to the Inquiry by Lothian Health Board.

73. By clause 12.5 of the Project Agreement, the Board confirmed that those of Project Co's Proposals which it had initialled satisfied the Board's requirements in respect of Operational Functionality, so far as could reasonably be determined given the level of detail of Design Data which had been disclosed to the Board. That confirmation was subject to the qualifications and comments set out in Section 9 of Schedule Part 6.

74. "Operational Functionality" has a detailed definition in Schedule Part 1 which is not concerned with the specification of ventilation. It is therefore unlikely that this section of Schedule Part 6 will have direct relevance to the Inquiry's Terms of Reference.

75. Section 9 lists various drawings and either marks them "No Comment"; or makes a comment; or refers the reader to comments on drawings. These entries have no obvious bearing on ventilation.

Schedule Part 8: Review Procedure

76. This is considered in the section above entitled "*Project Agreement: core provisions on design and construction".*

Schedule Part 10: Outline Commissioning Programme

77. This is considered in the section above entitled "*Independent Tester and Commissioning*".

Schedule Part 11: Equipment

78. This is considered in Appendix 2 of this note, in the context of section 4.21 of Project Co's Proposals.

Schedule Part 13: Independent Tester Contract

79. This sets out the form of the Independent Tester Contract that was to be concluded amongst Project Co, the Board and the Independent Tester (amongst others) at financial close (see definition of "*Independent Tester Contract*" in schedule Part 1).

80. The role of the Independent Tester, in the context of commissioning, is discussed above in the section headed "*Independent Tester and Commissioning".*

81. The services, obligations and tasks of the Independent Tester are set out in Appendix 1 of the form contract. They included the role of the Independent Tester as set out in clauses 17 (Pre-Completion Commissioning and Completion) and 18 (Post Completion Commissioning) of the Project Agreement. Clause 2.2 of the form contract provided that those duties were to be performed "*independently, fairly and impartially*"; and that the Independent Tester owed a duty of care to various parties associated with funding of the project. Clause 3.4 set out

the duty of care owed by the Independent Tester to Project Co and the Board, and a requirement for it to provide its services "*in accordance with all applicable Law and NHS Requirements*". These included CEL 19 (2010), which mandated the use of the Department of Health's Activity DataBase (ADB) for commissioning purposes.

82. The Independent Tester was deemed to have full knowledge of, inter alia, the Project Agreement (clause 3.8).

83. Its role included (Appendix 1 paragraph 1 of the form contract):

    a) attendance at monthly site progress meetings,

    b) regular inspections of the Works,

    c) identifying work that was not compliant with the Board's Construction Requirements, Project Co's Proposals, the Approved Reviewable Design Data and the Completion Criteria,

    d) issuing the Certificate of Practical Completion in accordance with the Project Agreement and issuing a Snagging Notice.

84. The Independent Tester was to familiarise itself with the Project Agreement and (amongst other things) any other relevant information referred to in it "*to the extent necessary to enable it to provide a report to the Board and Project Co on any contradictory requirements contained within the same …"* (Appendix 1 paragraph 2 of the form contract).

85. It had design review obligations. These included monitoring and reporting upon the implementation of the Design Quality

Plan for the construction and engineering services design for the Project; and reviewing the detailed design information for any approved design for compliance with the performance and quality standards of the Project Agreement (Appendix 1 paragraph 3.1 of the form contract).

86. Its construction review obligations included undertaking selective witnessing of the Mechanical and Electrical services testing and commissioning and reviewing all of the test results (Appendix 1 paragraph 5 of the form contract).

87. The foregoing comments relate to the form contract for the Independent Tester in the schedule to the Project Agreement. The executed version should be considered where necessary.

Schedule Part 14: Payment Mechanism

88. This set out the procedures for calculating the payments due to Project Co, being based broadly on the calculation of a Monthly Service Payment under deductions for certain failures of performance.

Schedule Part 16: Change Protocol

89. This set out the mechanism for dealing with change in the Works, Facilities or Services to be delivered under the Project Agreement.

Schedule Part 19: Record Provisions

90. This set out Project Co's obligations to maintain project records. Records relating to design and construction of the Facilities are to be retained for the duration of the Project Agreement (section 1, paragraph 3). Certain classes of

record are to be kept for a period after expiry of the Project Term.

Schedule Part 20: Dispute Resolution Procedure

91. This is discussed in the section above, entitled "*Dispute Resolution*".

Schedule Part 21: Project Co Information

92. This sets out certain information about Project Co and associated companies.

Schedule Part 22: Certificates

93. This includes forms for the practical completion certificate and the commissioning completion certificate.

Schedule Part 28: Board Policies

94. This listed the Board Policies, which included, under the heading "*Infection Control*", the National Infection Prevention and Control Manual. That document is said to be "*as set out on the disc in the Agreed Form identified and executed as the Schedule Part 28 (Board Policies) of this Agreement*".

Supplemental Agreement 2

95. This is between Lothian Health Board and IHS Lothian Limited, and dated 5 August 2000. Its title is *"Supplemental Agreement Number 2 relating Ventilation [sic.] Works in respect of the Project Agreement for the provision of RHSC and DCN at Little France".*

96. The Inquiry does not intend to cover Settlement Agreement 2 at the hearing commencing on 24 April 2023. The events leading to the conclusion of Settlement Agreement 2 will be covered at a later hearing. Settlement Agreement 2 is mentioned here only to assist in understanding the aspects of the Project Agreement which were in due course revised by it.

97. Recital B recorded that the Board wished to amend the ventilation system within the Facilities from four to ten air changes per hour, with an associated change to the pressure regime, all as described in Board Change Notice HVC107 dated 5 December 2019.

98. Recital D recorded that the Board had issued an Initial Engagement Agreement to Project Co instructing them to proceed with the design and associated activities of the Ventilation Works. Work carried out under that contract was agreed to form part of the Ventilation Works[15] (clause 4.2).

99. Recital E recorded that the purpose of Supplemental Agreement 2 was to amend and supplement the Project Agreement pursuant to the change notice to enable the design, construction, testing, commissioning and completion of the Ventilation Works, and to amend the Services to the Facilities as required as a result of the Ventilation Works.

100. The change notice was issued by the Board as a High Value Change notice under section 4 (High Value Changes) of Schedule Part 16 (Change Protocol) of the Project Agreement (clause 3.1), but the provisions of that section of the Project Agreement were departed from (clause 3.2).

[15] Defined below.

The approvals needed to authorise the change, and Project Co's entitlement to payment or compensation for the Ventilation Works, were given pursuant to Settlement Agreement 2 instead (ibid.). The parties agreed that the design, construction, commissioning, testing and completion of the Ventilation Works would be in accordance with the Ventilation Works Contract[16] and not the change provisions of the Project Agreement (clause 3.3). Payment for the Ventilation Works was to be in accordance with clause 7 and schedule part 8 of Settlement Agreement 2, instead of under the Project Agreement.

101. The Ventilation Works were defined as being "*the ventilation works at the Facilities to change the ventilation from 4 air changes to 10 air changes per hour with an associated change to the pressure regime all as described in and as instructed under the Board Change Notice*[17] *and as more fully described in the Scope*", the "*Scope"* being as set out in the Ventilation Works Contract, being the contract between Project Co and Imtech Engineering Services Central Limited in the form in Part 2 of the Schedule to Supplemental Agreement 2 or any replacement of it. Imtech were the Ventilation Works Contractor. The Settlement Agreement 2 also made provision for a Ventilation Works Sub-Contractor, being Hoare Lea LLP. Project Co was the client under the Ventilation Works Contract.

102. The draft Ventilation Works Contract in Schedule Part 2 provided, in Schedule Part 2A thereof (Contract Data Part One) that:

[16] A draft of this was included as Schedule Part 2 of Supplemental Agreement 2.

[17] I.e., Board Change Notice HVC107 dated 5 December 2019.

a) *"The works are Design, construction and installation, testing, commissioning and completion of new ventilation system and associated other works to serve Paediatric Critical Care and Haematology and Oncology areas on the 1st and 3rd floors respectively as further described in the Scope."*

b) *"The Scope is in the Schedule Part 3*". Schedule Part 3 provides that "*The Scope is as set out on the USB memory stick in the Agreed Form identified as the Scope with reference "HVC 107 Technical Data", referred to in and forming part of this contract".*

103. Schedule Part 7 to the draft Ventilation Works Contract (at Schedule Part 2 to Supplemental Agreement 2) set out the Completion Criteria for those works. These included: the design, construction, installation, testing, commissioning and completion of the ventilation works in accordance with Schedule Part 3; the reinstatement of equipment as previously installed; the testing and recommissioning of all services and building fabric affected by the works; compliance with the standards and requirements of a Handover Clean (being a detailed specification of cleanliness); and the provision of documentation to the Independent Tester (including as-built drawings, the health and safety file, operating and maintenance manuals, all testing and commissioning information and updated room data sheets).

104. Clause 6.2.2 of Supplemental Agreement 2 provided that:

"*Project Co shall be entitled to rely on Part A of the Scope and shall not have liability for any errors or omissions contained within it. Prior to Project Co entering into the*

Ventilation Works Contract, the Board and its advisers have reviewed the content of Part B of the Scope as it exists as at 27 May 2020 and the Board has received assurances from its technical advisers that the design included in Part B of the Scope meets the requirements of Part A of the Scope. The Board's technical advisors assurance statements are provided at Schedule Part 9. For the purposes of the Ventilation Works Review Procedure[18]*, the Board and Project Co agree that with the exception of any items of Reviewable Design Data that remain as listed in the Scope the design contained in Part B of the Scope as it exists as at 27 May 2020 shall, be deemed to have been reviewed in accordance with the Ventilation Works Review Procedure.*"

105. Schedule Part 9 comprised letters from the Board's Advisers, described as "*Design Assurance Statements"*. There were letters from NHS NSS (in their capacity as Scottish Government Technical Observer); Mott Macdonald; and John Rayner of Turner Property Services Limited (as Lothian Health Board's Authorising Engineer for Ventilation). They are in qualified terms.

106. Clause 6.6.1 of Supplemental Agreement 2 provided that:

"The Board and Project Co undertake and agree to jointly instruct the Independent Tester to provide such testing and certification services as are required pursuant to this Agreement and the Ventilation Works Contract, as further

[18] The scope and purpose of this procedure is unclear. It is defined as "*the Request for Information Protocol in the Scope*". "*Reviewable Design Data*" was defined as "*the items of design that remain to be reviewed as detailed in the Scope"*. Clause 21A of the draft Ventilation Works Contract at Schedule Part 2 of Supplemental Agreement 2 made provision for the submission of Reviewable Design Data for approval by Project Co and the Board.

described in the Independent Tester Varied Services Letter".

The "*Independent Tester Varied Services Letter*" was defined as the letter signed by the representatives of Project Co and the Board instructing the Independent Tester to provide varied services. A form of the letter was contained in Schedule Part 6.

107. Schedule Part 6 comprised a form letter from Project Co and NHSL to the Independent Tester (Arcadis LLP, formerly EC Harris LLP) instructing it to perform varied services: in short, to issue the Certificate of Completion under clause 35.5 of the Ventilation Works Contract[19] once satisfied that that all of the Completion Criteria and other relevant provisions of Supplemental Agreement No 2 had been complied with.

108. By clause 5.1 and Schedule Part 1 of Supplemental Agreement 2, amendments were made to the Project Agreement. These included amendments to the definitions to take account of the Ventilation Works (e.g., to the Board's Construction Requirements, Completion Criteria, Plant, Project Co's Proposals, Reviewable Design Data and Room Data Sheets).

109. Schedule Part 4 comprised a Service Contract Amendment Agreement, between Project Co and Bouygues E&S Solutions Limited, amending the services contract between

[19] This clause does not appear in the schedules to Supplemental Agreement 2: the Ventilation Works Contract forming Schedule Part 2 of that agreement is based on the NEC4 ECC Option E standard form with additional conditions of contract (option Z). The standard form is not included in the schedules. Clause 35.5 of the standard form is left unamended by the project specific provisions.

those parties dated 13 February 2015. Recital F to that draft provided: "*Project Co and the Service Provider have entered into this agreement to pass down relevant amendments concerning the provision of services in relation to the ventilation works and to reflect the necessary changes required to the services contract".*

The Environmental Matrix and Published Guidance

110. As noted above, the Board's Construction Requirements feature prominently in the Project Agreement specification. These required compliance with the Environmental Matrix. The Environmental Matrix included specific parameters for the ventilation system. It was not, however, set in stone at financial close: it was Reviewable Design Data and subject to Project Co's obligation to develop and finalise the design and specification. Further, Project Co did not have to comply with the Environmental Matrix (or any other part of the Board's Construction Requirements) to the extent of the derogations in section 4.31 of Project Co's Proposals. As noted above, these included derogations about the Environmental Matrix. Those factors give rise to some ambiguity (or at least some room for argument) about the contractual status of its contents.

111. In addition to that, there are many provisions of the Project Agreement[20] which specify, or might at least be argued to specify, compliance with SHTMs and with CEL 19 (2010). To the extent that the Environmental Matrix conflicted with that guidance, it is relevant to consider whether, and if so

[20] Especially throughout the Board's Construction Requirements (section 3 of part 6 of the Schedule). There are too many of these to quote here, and they are set out in Appendix 1 to this note.

how, the Project Agreement made provision for reconciling or resolving potential conflicts.

112. This is not straightforward . The first issue contributing to the difficulty is the ambiguous status of the Environmental Matrix itself, noted above. At one end of the spectrum, it might (or at least parts of it might) be construed as a precise and definitive requirement of the Board which, insofar as it provides highly particularised details for individual rooms, must be taken to override any more generalised requirements. At the other end of the spectrum, it might be considered as no more than Disclosed Data, for which the Board had no contractual liability, and which was subject in all relevant respects to Project Co's obligation to finalise the design and specification in accordance with the more generalised requirements. Which category it falls into may depend on the extent to which the relevant issues with the Environmental Matrix were the subject of Project Co's derogations in section 4.31 of Project Co's Proposals.

113. It is not obvious that any solution comes from the particular provisions in the Project Agreement intended to resolve conflicts. For example, paragraph 2.5 of the Board's Construction Requirements, headed "*Hierarchy of Standards*" applies "*[w]here contradictory standards / advice are apparent within the terms of the Board's Construction Requirements"*. This may have been intended to apply to conflicts between standards such as published guidance, and not to conflicts between published guidance and a specific requirement laid down by the Board. In any event, where the Board's requirements include a specific parameter for a specific room which differs from generalised guidance, it is not obvious that this falls to be construed as a 'conflict': a more natural interpretation may be that the

Board has specified a departure from the generalised guidance.

114. It may not, however, be necessary for the Chair to reach a concluded view in order to fulfil the Terms of Reference. The Chair may require to consider whether the relevant provisions of the Project Agreement provided an incomplete specification and/ or were ambiguous and thereby open to conflicting interpretations.

Issues for the Chair to Consider

115. At the highest level of generality, the main question to be answered about the Project Agreement is: to what extent, if any, did risk of adverse impacts on patient safety and care derive from the terms of the Project Agreement itself? That in turn informs what aspects of the procurement process leading to that contract are directly relevant to the Inquiry's investigations.

116. Answering that question requires:

a) a precise definition of those potential adverse impacts;

b) identification of the terms of the Project Agreement, if any, which bore upon their occurrence.

117. These are both matters on which the Inquiry's view is likely to develop as its investigations proceed.

118. It is reasonable to assume that a complete answer to the question will have to take account of events after financial close. That is because the documents presently understood to have had a critical impact on the ventilation system (the

Room Data Sheets and the Environmental Matrix) were Reviewable Design Data. They were incomplete and unfinished at financial close. The state of the ventilation system at completion is likely, therefore, to have been based at least in part on versions which were created, reviewed and approved after financial close.

119. It will be important for the Inquiry to identify any such post-financial close variants which were implicated in the occurrence of the risk of adverse impacts on patient safety and care.

120. It is likely also to be relevant to consider the development and approval of those variants, at least insofar as they were implicated in the risk of adverse impacts. Deficiencies in them may, or may not, be attributable to the Project Agreement itself. They may instead be attributable to the way in which the Project Agreement was applied.

121. Detailed investigation of events after financial close are to take place later. At this stage, it may be possible to begin to develop tentative and provisional views about the extent, if any, to which the relevant risk of adverse impacts on patient safety and care were caused by inadequacies in the contractual specification (such as errors, ambiguities, omissions, or its incomplete state); or by other inadequacies in the contracts (such as in the mechanism for review of designs). Tentative and provisional views may also be reached on the extent to which any such inadequacies were present at financial close, or must have arisen later.

122. To the extent that any such deficiencies were present in the contract at financial close, that should help refine and focus

investigation of the procurement process leading up to financial close.

APPENDICES

NOTE: The Appendices quote provisions from some of the technical schedules to the Project Agreement. Given their technical nature, evidence or explanation may be needed before a concluded view can be reached about their relevance. The Inquiry welcomes considered input from Core Participants to that end. At this stage, the aim is to identify, and record here, those provisions which might at least possibly bear on the issues relevant to the Inquiry's Terms of Reference.

APPENDIX 1: Extracts from the Board's Construction Requirements

Board's Construction Requirements

Overview

1. These are found at Schedule Part 6 (Construction Matters) Section 3 (Board's Construction Requirements) of the Project Agreement.

2. They are divided into five Sub-Sections (A to E) and six Appendices (B, E, N, O, P and Q).

3. The appendices, with one possible exception, do not appear likely to be relevant to the Inquiry's Terms of Reference. The possible exception is Appendix P (Thermal and Energy Model Parameters).

4. Sub-Section A is an introduction with little substantive content.

5. Sub-Section B contains Definitions and Abbreviations for the BCRs. These are in addition to the longer list of definitions at Schedule Part 1 of the Project Agreement.

6. Sub-Section C contains the General Requirements, being the "*overall philosophy and standards for the design, construction and finish and associated infrastructure, both internal and external for the Works and/or the Facilities"*. These are lengthy and detailed and run to 139 pages. They are the central source of the Board's requirements for the project.

7. Sub-Section D contains the Specific Clinical Requirements, being the "*design philosophy and specific requirements for each of the Clinical Services to be provided from the Facilities*". These are made up of 43 separate electronic files, each relating to a particular clinical service.

8. Sub-Section E contains the Specific Non-Clinical Requirements. They do not appear to be relevant to the Inquiry's work.

Board's Construction Requirements: Sub-Section B: Definitions & Abbreviations

9. Material definitions include:

    a) "*Environmental Matrix Means the Environmental Matrix, which details the room environmental condition requirements of the Board required within each department / unit / space / area as set out in Section 6 (Construction Matters) (as varied, amended or supplemented from time to time in accordance with the Project Agreement)*"

    b) *"NHS Requirements Means the requirements defined in paragraph 2.3 of this Schedule Part 6 Section 3 Sub-Section C as the same may be amended from time to time".* The provisions of paragraph 2.3 are quoted below.

Board's Construction Requirements: Sub-Section C: General Requirements

10. These run to 139 pages and are divided into 10 parts dealing with aspects of the Board's requirements. Those

most likely to be relevant to the Inquiry's Terms of Reference are the following:

a) 1. Introduction

b) 2. Project Wide Requirements

c) 3. General Design Requirements

d) 4. Site Specific Requirements

e) 5. General Construction Requirements

f) 8. Mechanical & Electrical Engineering Requirements

11. To construe the Board's Construction Requirements properly, it is likely to be necessary to read them as a whole. The following extracts are those most likely to have at least some potential bearing on the correct construction of those parts relevant to the Inquiry. Once a more precise understanding of the relevant facts is available, it may be possible to refine the selection of quotations. The paragraph numbers to the left of the quotations which follow do not form part of the quotation, but have been included to facilitate reference and discussion:

1. Introduction

12. *This document sets out the key design criteria and the core requirements to create a modern facility to re-provide services from the Existing RHSC, Existing CAMHS and the Existing DCN in a single building adjoining the RIE Facilities at the Campus Site. The design shall be enduring and take account of the history, culture and physical requirements of these internationally renowned centres of excellence.*

13. *This Sub-Section C of the Board's Construction Requirements forms the general construction requirements of the Board's Construction Requirements. Project Co shall satisfy all the requirements under this Sub-Section C.*

14. *This (and subsequent) sections of Sub-Section C of the Board's Construction Requirements outlines the overall aims of the Board with regard to the design quality of the Facilities. This Sub-Section C shall be read in conjunction with, but not limited to the following documents:*

15. *1.1 The Board's Policies*[21]*; and*

16. *1.2 Project Specific Requirements as defined in Sub-Sections D (Specific Clinical Requirements) and E (Specific Non-Clinical Requirements) and Appendices to the Board's Construction Requirements. …*"

2. Project Wide Requirements

17. *The Board's vision is to provide high-quality, patient-centred services from modern Facilities. … The physical design and access to the Facilities shall promote and enhance the delivery of that full range of services, all to the benefit of patients, visitors, public and staff alike. Additionally the design strategy shall respond to the needs and aspirations of a variety of service providers including the NHS, local*

[21] Defined as "*subject to Clause 27.7 (Board Policies), the policies of the Board set out in Schedule Part 28 (Board Policies) as amended from time to time".* The listed policies include ones about infection control. They include the National Infection Prevention and Control Manual. Neither it, nor other listed policies bearing on infection control, seem likely to be relevant to the Inquiry's Terms of Reference ("*Healthcare associated infection: staff screening during incidents and outbreaks"*, "*Legionella"* and "*Pseudomonas*"). The policy on "*Window management*" is potentially relevant, given the apparent intention that ventilation air changes be partly based upon open windows.

authorities and other community based services. The wish of the Board is to create a centre of excellence that may be an inspiration to others and set a benchmark of quality of sustainable design.

18. *Project Co shall ensure the design complies with the general ethos detailed here, whilst also addressing the detailed requirements listed in the following clauses. It shall be noted that the requirements detailed are not exhaustive, and it is recognised that specific clinical needs will determine the nature and design of Facilities in some areas.*

19. *The Board requires the following matters to be addressed as part of its requirements:*

    a) *the need for Project Co to maintain leadership throughout to the agreed final design stage and;*

    b) *the Board's management team will be actively involved and will support both the project team and the clinicians.*

20. *Project Co shall support the Board's vision as stated above and develop a partnership with the Board to ensure that these aspirations are met and that Project Co co-operate fully in the evaluation of these criteria with the Board at key stages of the process.*

21. *Project Co shall ensure that the design of the Facilities draws upon and endeavours to further develop, improve and exceed current best practice (and Good Industry Practice) standards achieved in other similar schemes, and meets the requirements of the prospective patient groups, staff and the public. …*

22. *The Board is keen to actively participate in the design process. To facilitate this, Project Co shall engage the Board in the design and in particular the Reviewable Design Data.*

23. *2.1 Approach to Design …*

24. *The new building will follow the design aspirations and guidance laid out in the Policy on Design Quality for NHS Scotland (2010)*[22] *to which the Board subscribes and implements though its Design Champion. …*

25. *The design will be evaluated against BREEAM 2011 New Construction (SD5073) (which BREEAM ENE1 target of 6 credits (excellent) in accordance with the BREEAM Scheme Document for New Construction (SD5073) Section 6.ENE1). …*

26. *The Design Champion for the project is the NHS Lothian's Project Sponsor, supported by the Director of Capital Planning and Projects, and the design process is managed by the reprovision project team.*

27. *Project Co shall take cognisance of all the architectural and building services implications of the requirements described in the Board's Construction Requirements in this Schedule Part 6 Section 3 Sub-Section D (Specific Clinical Requirements) …*

[22] The requirements of this policy included achievement of a BREEAM Healthcare (or equivalent) 'Excellent' rating; and the mandatory use of ADB (Activity Database) as a tool for briefing, design and commissioning, except where deemed inappropriate for a particular project and an alternative was used. In such circumstances, it was incumbent on the Board to demonstrate that the alternative was of equal quality and value in its application.

28. *2.2 General Requirements of the Board*

29. *Architectural and General Design*

30. *Project Co shall ensure the Facilities comply with the following general requirements of the Board: …*

31. *(b) Adherence to the requirements set out in CEL 19 (2010) "A Policy for Design Quality for NHS Scotland, 2010 Revision published by the Scottish Government …*

32. *All standards, guidance, codes of practice and all other titled requirements that Project Co shall comply with are to be the current version of the requirement or its replacement requirement without the need for a Change. Refer also to paragraph 2.5 below.*

33. *2.3 NHS Requirements*

34. *In addition to the standards listed in paragraph 2.4 of this Sub-Section C of the Board's Construction Requirements, unless the Board has expressed elsewhere in the Board's Construction Requirements, a specific and different requirement, the Facilities shall comply with but not be limited to the provisions of the NHS Requirements as the same may be amended from time to time …*

35. *(d) HAI SCRIBE …*

36. *(h) HTM and SHTM …*

37. *v. Health Technical Memoranda & Scottish Health Technical Memoranda (HTM & SHTM)*

38. *Project Co shall, in relation to all SHTM and all HTM (except HTM where an SHTM exists with the same number and covering the same subject matter): take fully into account the guidance and advice included within such SHTM and HTM; ensure that the Facilities comply with the requirement of such SHTM and HTM; and adopt as mandatory all recommendations and preferred solutions contained in such SHTM and HTM …*

39. *viii. Scottish Government Health Directorates Circulars (CEL and HDL)*

40. *Project Co shall, in relation to all CEL and HDL take fully into account the guidance and advice included within CEL and HDL. Project Co shall ensure the Facilities comply with the requirements of CEL and HDL and shall adopt as mandatory any recommendations. …*

41. *x. Sustainability …*

42. *Project Co's Proposals shall allow the Facilities to achieves as a minimum "very good" rating when subjected to a BREEAM 2011 New Construction (SD5073) and BREEAM ENE1 target of 6 credits (excellent) in accordance with the BREEAM Scheme Document for New Construction (SD5073) Section 6.ENE1 assessment. …*

43. *xi. General …*

44. *Project Co shall also take fully into account the guidance and advice included within the following publications as the same are amended from time to time: …*

45. *(d) Infection Control in the Built Environment (SHFN 30 & HAI-SCRIBE); …*

46. *(g) Scottish Infection Manual – "Managing the Risk of HAI in NHS Scotland" …*

47. *2.4 Minimum Design and Construction Standards*

48. *Project Co shall also ensure that the Facilities comply with Good Industry Practice*[23]*, NHS Scotland requirements, relevant statutory requirements … and required consents including, but not limited to, the following as the same may be amended from time to time: … [various pieces of legislation etc, including building regulations, relevant British Standards, Codes of Practice] …*

49. *2.5 Hierarchy of Standards …*

50. *Where contradictory standards / advice are apparent within the terms of the Board's Construction Requirements and the Appendices then subject to the foregoing paragraph then (1) the most onerous standard / advice shall take precedence and (2) the most recent standard / advice shall take precedence. When the more onerous requirement is to be used the Board will have the right to decide what constitutes the more onerous requirement.*

[23] Defined as meaning "*using standards, practices, methods and procedures conforming to the Law and exercising that degree of skill and care, diligence, prudence and foresight which would reasonably and ordinarily be expected from a skilled and experienced person engaged in a similar type of undertaking under the same or similar circumstances*". The definition of Law extended to include "*any applicable guidance, direction or determination with which the Board and/or Project Co is bound to comply to the extent that the same are published and publicly available or the existence or contents of them have been notified to Project Co by the Board … in each case in force in Scotland"* (Schedule Part 1).

51. *Where there is a conflict of interest resulting from the use of the standards / advice Project Co shall involve the Board in the decision making process. The Board shall be entitled to make the final decision regarding the standards / advice to be used for the Facilities including any contradictions that may arise between items (1) and (2) above.*

52. *NHS Scotland standards shall take precedence over equivalent NHS England and Wales's standards.*

53. *In certain instances, NHS publications include a number of options or alternative solutions. Where the Board has defined their preference specifically, Project Co shall adopt these preferences as a mandatory requirement. Where no Board preference is stated, Project Co shall engage the Board in the design development process to seek and incorporate the Board's preference within the Facilities.*

54. *While the Board has placed a clear obligation on Project Co in relation to NHS publications, it also wishes to acknowledge that in certain cases the subject matter, guidance and advice included therein may have been further developed and improved since the date of publication. In this regard, the Board does not wish to limit the use of current best practice or innovation in relation to the adoption of design standards.*

55. *For the avoidance of doubt, the Board considers NHS publications reflect minimum standards and any alternatives proposed by Project Co shall provide a similar or enhanced level of service and quality. …*

56. *2.7 Derogations Register:*

57. *Project Co shall comply with Section 3 (Boards Construction Requirements) of Schedule Part 6 (Construction Matters), subject to the agreed derogations as set out in sub-section 32 (Derogations Register) of Section 4 (Project Co's Proposals) of Schedule Part 6 (Construction Matters).*[24]

58. *3 General Design Requirements*

59. *Project Co shall design the Facilities to address the following issues: …*

60. *3.5.2 Clinical & Non Clinical Functionality*

61. *The Facilities shall be designed to accommodate the Clinical, Non-Clinical and other functions ascribed to them in terms of space, environment and the efficient and safe operation of equipment, as defined in Sub-Section D (Specific Clinical Requirements) and Sub-Section E (Specific Non-Clinical Requirements) of the Board's Construction Requirements. …*

62. *3.5.6 Single Room Accommodation*

63. *DCN and CAMHS will have 100% of inpatient spaces in single rooms, and in the RHSC approximately 59% of inpatient spaces will be in single rooms, which will facilitate … infection control …*

[24] As noted in the section on Project Co's Proposals below (in relation to section 4.31 thereof), there were derogations in relation to the Environmental Matrix and to mechanical ventilation and air conditioning. The derogation about the Environmental Matrix noted that it contained anomalies and that proposals had been incorporated within the room data sheets, and that the matter was to be developed on the basis of comments in Section 5 of Schedule Part 6 (Reviewable Design Data).

64. *3.6.3 Room Data Sheets*

65. *Project Co shall provide Facilities that, as a minimum, meet all the requirements specified in the Room Data Sheets included in Section 6 (Room Data Sheets) of the Schedule Part 6 (Construction Matters) of the Project Agreement. Room Data Sheets not included in Section 6 (Room Data Sheets) of the Schedule Part 6 (Construction Matters) of the Project Agreement shall be provided through RDD.*

66. *Project Co shall provide fully developed Room Data Sheets submitted to the Board as Reviewable Design Data for review by the Board in accordance with Schedule Part 8 (Review Procedure) and Clause 12.6 (Board design approval) of the Project Agreement.*

67. *As part of the commissioning process, Project Co shall be responsible for demonstrating compliance with the requirements included within the Room Data Sheets.*

68. *For the avoidance of doubt, Project Co shall provide mechanical ventilation, comfort cooling and air conditioning to suit the functional requirements of each of the rooms in the Facilities. Irrespective of the ventilation requirements in Room Data Sheets, where rooms are clearly intended to be occupied and / or become internal spaces during design development and natural ventilation is not possible, mechanical ventilation and or extract ventilation shall be provided as appropriate to suit the function of the space. …*

69. *4 Site Specific Requirements …*

70. *4.5 Construction Phase Requirements …*

71. *4.5.17 Completion Requirements*

72. *On completion of the Works, Project Co shall provide the Facilities as clean to comply with the Schedule Part 10 (Outline Commissioning Programme) of the Project Agreement. Project Co shall demonstrate how the proposals facilitate the control and management of an outbreak and spread of infectious diseases in accordance with SHTM 03-01 and SHFN 30. …*

73. *By the date for Project Co to make available the principal operation and maintenance manual set in Clause 18.5 (Operational Manuals) of the Project Agreement, Project Co shall provide to the Board a complete set of electronic records representing the design, construction, testing and commissioning and completion of the "as constructed" Facilities that include the routes of all building services. This shall include, but not be limited to, a full set of as-built records, drawings, specifications and the like and the documents in the Completion Criteria, incorporating all changes to the design and all remedial works during construction. The documents and drawings format(s) and 2 number of copies are to be provided by Project Co.*

74. *For the purposes of Clauses 17.18 (As-built specification) and 18 (Post-Completion Commissioning) of the Project Agreement all final as-built records for the Facilities shall include, as a minimum:*

75. *a) Design information including all relevant design calculations, parameters, assumptions, standards, specifications, product data sheets for all components and parts, including details of the influence on the design of*

actual construction methods, including any change or remedial works during construction.

76. *b) As built drawings for all component parts of the Facilities;*

77. *c) Testing and commissioning records for all discrete components, subsystems, systems and the Facilities as a whole;*

78. *d) Operating and maintenance manuals;*

79. *e) Health and safety file;*

80. *f) Full set of design, construction, testing and commissioning and completion records/certification.*

81. *g) All other information that is required to be collated under the Construction (Design and Management) Regulations 2007 as amended from time to time. …*

82. *5.2 Infection Prevention & Control*

83. *… Project Co shall ensure all aspects of the Facilities allow for the control and management of any outbreak and/or spread of infectious diseases in accordance with the following: (a) Infection Control in the Built Environment: Design and Planning (SHFN 30); … (f) Ventilation in Healthcare Premises (SHTM 03-01)…".*

84. *5.25 Sustainability …*

85. *The Facilities shall, as far as reasonably practicable, deliver benefits to the environment. Project Co shall: a) Implement a strategy to meet the BREEAM requirements outlined in 5.25.1 below …*

86. *5.25.1 BREEAM*

87. *Project Co shall ensure that the Facilities achieve as a minimum a "Very Good" rating when assessed against BREEAM 2001 New Construction (SD5073).*

88. *… In addition, BREEAM embraces energy efficiency and passive design strategies for ventilation and thermal control to enhance internal comfort. The Facilities shall therefore also meet a BREEAM ENE1 target of 6 credits ('Excellent' level of performance) in accordance with the BREEAM Scheme Document for New Construction (SD5073) Section 6.ENE1. …*

89. *5.26 Energy Strategy*

90. *Project Co shall provide Facilities that achieve an optimum level of energy and utility conservation. Project Co shall: a) Minimise internal areas requiring mechanical ventilation …*

91. *8 Mechanical & Electrical Engineering Requirements*

92. *Project Co shall provide the Works to comply with the Environmental Matrix.*

93. *Project Co shall in carrying out the Works comply with the following non-exhaustive list of mechanical and electrical requirements.*

94. *Project Co shall provide mechanical and electrical systems that help create a "state of the art" building with innovative design. Project Co shall provide an engineering system that utilises the latest technology to create a high quality working environment that will provide a reassuring, enjoyable and*

convenient hospital for all patients, their families, visitors and staff. …

95. *Project Co shall take cognisance of all the building services implications of the requirements described in Section D (Specific Clinical Requirements) and Sub-Section E (Specific Non-Clinical Requirements) of Sub-section C of the Board's Construction Requirements.*

96. *For the avoidance of doubt the hierarchy of standards and advice detailed in paragraph 2.5 (Hierarchy of Standards) of Sub-section C of the Board's Construction Requirements shall apply to this paragraph 8.*

97. *8.1 Minimum Engineering Standards*

98. *In addition to the publications in paragraph 2 (Project Wide Requirements) of Sub-Section C of the Board's Construction Requirements, Project Co shall ensure that the design, construction and selection of components for the mechanical and electrical works comply with, including but not limited to, the following design reference documents: … (b) All current relevant legislation, guidance and Codes of Practice by CIBSE …*

99. *The following is a non-exhaustive list of SHTM's, HBN's and HTM's applicable to the Facilities: … (h) SHTM 03-01: Ventilation in Healthcare Premises …*

100. *8.2 Infection Control*

101. *Mechanical and electrical equipment selections and designs shall take cognisance of HAI-SCRIBE in its entirety. …*

102. *8.5 Performance Standards*

103. *8.5.1 Energy Performance Certificate*

104. *Project Co shall ensure that the Facilities shall operate to achieve an Energy Performance Certificate (EPC) rating of C or better. …*

105. *8.5.3 Air Quality*

106. *i. Internal*

107. *Air quality in all areas shall take account of occupancy levels, internal pollutants, heat gains, external pollutants and atmospheric conditions and shall be controlled to provide adequate comfort and fresh air levels appropriate to the functions of each department area.*

108. *Particular attention shall be given to the risk of cross infection within the hospital / healthcare environment and shall be such as to minimise the spread of infection. Project Co shall demonstrate through submission of information to the Board as Reviewable Design Data for review by the Board in accordance with Schedule Part 8 (Review Procedure) and Clause 12.6 (Board design approval) of the Project Agreement, how the proposals facilitate the control and management of an outbreak and spread of infectious diseases, and in particular shall comply with the requirements of SHTM 03-01 (Ventilation in Healthcare Premises). In order to reduce cross-contamination, the design of the Facilities shall incorporate 100% fresh air supply systems only.*

109. *Project Co's demonstration referred to above is to cover all aspects of the building, its services, spatial relationships,*

soft and hard FM proposals and incorporate requirements of the Board's Infection Control Team.

110. *Project Co shall provide natural ventilation wherever possible, except where … b) Safety or security features must be provided … e) Clinical requirements, as detailed in the Room Data Sheets, do not allow in areas such as isolation rooms, where positive or negative pressure are required; and f) Areas which are air-conditioned. …*

111. *8.7 Mechanical Systems*

112. *The Project Co shall design, supply, install, test, commission, operate and maintain all mechanical building services necessary to support the Clinical Services at the Facilities. The following systems are indicative of those anticipated by the Board but are not exhaustive and sole responsibility shall be Project Co's to determine all necessary systems are included.*

113. *Systems shall be design [sic.], supplied, installed, tested, commissioned, operated and maintained all in accordance with the regulations and standards. …*

114. *8.7.8 Mechanical Ventilation and Air Conditioning …*

115. *Project Co shall demonstrate how the proposals facilitate the control and management of an outbreak and spread of infectious diseases in accordance with SHTM 03-01, SHFN 30 and HAI-SCRIBE.*

116. *Project Co demonstration is to cover all aspects of the building, its services, spatial relationships, Soft and Hard*

FM proposals (as appropriate) and incorporate requirements of the Board's Infection Control Team. …

117. *8.7.21 High Specification Air Conditioning Systems*

118. *Project Co shall provide high specification, full function and close control air conditioning systems to support the Board's Clinical Output Specification that are contained in Sub-Section D (Specific Clinical Requirements) of the Board's Construction Requirements, such as but not limited to: a) Laminar flow rooms and / or operating theatres …*

119. *Air conditioning systems installed in the above areas shall be higher specification air conditioning systems with standby motors belted up in accordance with SHTM 03-01, 04-01 and NHS Model Engineering Specification C04.*

120. *8.7.22 Ventilation and Air Conditioning of Isolation Rooms*

121. *Project Co shall provide air conditioning systems to Isolation Rooms to support Sub-Section D (Specific Clinical Requirements) of the Board's Construction Requirements, NHS Standard Infection Control Precautions (SICPSs) and maintaining strict positive / negative pressure differentials.*

122. *Ventilation and air conditioning systems for these rooms shall be designed and installed in accordance with SHTM 03-01, 04-01 and NHS Model Engineering Specification C04. Project Co shall demonstrate how the proposals facilitate the control and management of an outbreak and spread of infectious diseases. …*

123. *8.15 Commissioning and Testing*

124. *All buildings, services and equipment shall be commissioned by Project Co to ensure that all they are [sic.] compliant with the quality and performance specifications, including manufacturer's recommendations, and that all systems operate to the Board's satisfaction.*

125. *Project Co shall as a minimum commission the Facilities in accordance with the 'Guidance to Engineering Commissioning' published by The Institute of Hospital Engineers (1995).*

126. *Project Co shall be responsible for demonstrating and certifying to the Board the successful completion of all commissioning testing, and compliance with all relevant standards.*

127. *Project Co shall provide a comprehensive set of operation and Maintenance Manuals (in hard and electronic forms) for all installed and commissioned equipment in a format specified in paragraph 4.5.17 (Completion Requirements) of Sub-Section C of the Board's Construction Requirements and in accordance with the requirements in Clauses 17.18 (As built specification) and 18 (Post Completion Commissioning) of the Project Agreement.*

Board's Construction Requirements: Sub-Section D: Specific Clinical Requirements

128. These are to be read in conjunction with the General Requirements (Sub-Section C, paragraph 1.2). Project Co was required to design the Facilities to accommodate the clinical functions described in the Specific Clinical Requirements, and to take cognisance of their implications for building services (Sub-Section C, paragraphs 2.1 and

3.5.2). They were to "*design, supply, install, test, commission, operate and maintain all mechanical building services necessary to support the Clinical Services at the Facilities*" (Sub-Section C, paragraph 8.7).

129. The opening words to Sub-Section D provide that:

"Project Co shall satisfy all the requirements under this Sub-Section D.

It contains design philosophy and specific requirements for each of the clinical services to be provided from the Facilities."

130. The conformed copy of the Project Agreement contains no further provisions, but the Inquiry has 43 separate electronic files, each relating to a particular clinical service and with its own code. These bear from their titles to be "*Clinical Output Based Specifications*" and typically include a general reference to applicable guidance including SHTM 2025 on ventilation. With occasional exceptions, usually relating to isolation rooms, they do not contain detailed provision on ventilation requirements.

131. The Inquiry would welcome observations from CPs on which (if any) of these output specifications are relevant to its Terms of Reference.

132. Of the 43 files, those which appear to the Inquiry of potential relevance include B1 Critical Care and C1.4 Haematology and Oncology Inpatients.

Board's Construction Requirements: Sub-Section E: Specific Non-Clinical Requirements

133. These do not appear to be relevant.

Board's Construction Requirements: Appendices

134. With one possible exception, these do not appear to be relevant to the Inquiry's Terms of Reference.

135. The possible exception is Appendix P, on Thermal and Energy Model Parameters. It provides that, in addition to energy modelling to satisfy section 6 of the Building Regulations (Scotland) Technical Standards, and the BREEAM credit ENE 01 requirements, Project Co were to undertake further energy modelling to inform the Board of proposed energy consumption and cost. At 1.1, the Appendix provides that

> "*The thermal and energy performance of the Facilities shall be modelled by Project Co to the Project Specific parameters, identified within the Board's Construction Requirements. Project Co's thermal and energy modelling shall inform the sizing of all heating, ventilation and comfort cooling requirements for Project Co's Proposals, inclusive of all natural ventilation pathway and overheating analysis.*
>
> *Project Co shall provide proposed energy consumption figures from their 'all inclusive' thermal and energy modelling, with all supporting documentation including model inputs, assumptions, calculations and reporting, at the following design stages:*

1.1.1 Finalised design, as part of Reviewable Design Data; …

The following documentation shall be used by Project Co in providing the thermal and energy modelling for the Facilities:

1.1.2 *Scottish Health Technical Memorandums …”*.

APPENDIX 2: Extracts from Project Co's Proposals

Project Co's Proposals: Introduction

1. Project Co's Proposals are at Schedule Part 6 (Construction Matters) Section 4 (Project Co's Proposals) of the Project Agreement.

2. They do not form part of the Conformed Copy of the Project Agreement available to the Inquiry, and are said to be "*as set out on the disc in the Agreed form agreed and executed as*" the following:

    a) Disc 1 (Project Co Proposals)

    b) Disc 2 (HLM Operational Functionality and Financial Close Drawings)

    c) Disc 3 (Robert Bird Group Financial Close Drawings)

    d) Disc 4 (TUV SUD Ltd Financial Close Drawings)

    e) Disc 5 (Mercury Financial Close Drawings)

    f) Disc 6 (Catering Design Services Financial Close Drawings)

3. This Appendix draws upon the contents of disc 1. Core Participants are encouraged to draw the Inquiry's attention to any provisions on the other discs which are considered to be relevant to the Terms of Reference.

Disc 1 (Project Co's Proposals)

4. This is 3942 pages long and includes many documents (such as detailed plans) of a technical nature. The pages may, to some extent, be out of sequence: for example, what appears to be an inventory for Project Co's proposals (and therefore what one would expect to appear on page 1) appears at page 266.

5. The file begins with 23 pages of plans, each of which is stamped by the Board to denote that they are Reviewable Design Data. These stamps are signed on behalf of the Board by Brian Currie, with a comment level (e.g. A, C), and a reference (for the Board's comments) to Section 5 (Reviewable Design Data) of Schedule Part 6 (Construction Matters). It is not clear which, if any, of these plans bears upon the Inquiry's remit. Pages 10 and 18 are plans of Ventilation Distribution. Both are marked Level C, indicating that they were subject to amendment as noted (apparently in part 2 of section 5 (Reviewable Design Data) of schedule part 6 (Construction Matters)). The plans carry references beginning with "WW", indicating they were prepared by Wallace Whittle[25].

6. The plans are followed by a document entitled "Aconex User Manual: Documents and Information Control Procedures" (pages 24 to 73)[26]. This concerns electronic document management procedures for the project, including the ITPD stage, and specified protocols for the exchange of

[25] Wallace Whittle were later renamed TUV SUD Limited. It may therefore be that these are, in fact, the drawings which, according to the cover sheet for section 4 (Project Co's Proposals) of part 6 (Construction Matters) of the schedule to the Project Agreement were contained on disc 4 ("TUV SUD Limited Financial Close Drawings").

[26] This appears to be out of sequence. It would appear to be appendix 2 to Section 4.2 of Project Co's Proposals (Design Management), which refers to an appendix being "the Aconex User Manual" (page 269).

information on the project. It indicates a highly formalised structure for proper record keeping including document numbering conventions.

7. That is followed by a document entitled "Design Management Procedures" (pages 74 to 105)[27]. Its purpose is to outline the design management principles and procedures for the project. It may be relevant in understanding how the design team were intended to function to implement the Board's Construction Requirements. For example, it identifies personnel (John Ko as the Multiplex Design Director, Darren Smith as the Multiplex Project Design Manager, and Steve Pardy as the representative of Wallace Whittle, the M&E Designers: page 80). It may be helpful in understanding design responsibilities (for example, it refers to design compliance statements to be produced periodically by consultants: page 82, paragraph 4.8; identifies Mercury Engineering as a subcontractor with design responsibility for, inter alia, mechanical matters (page 83); refers to the need to comply with Employer's Requirements (i.e., the BCRs) (page 89, paragraph 7.4.1); and to the key responsibilities of the design manager including understanding the Employer's Requirements and communicating that to the project team (page 101).

8. A document entitled "Schedule of Accommodation" appears at pages 150 to 241. This appears to list different departments and the particular rooms required within them. The particular rooms are given room number codes, which

[27] This also appears to be out of sequence. It would appear to be appendix 1 to Section 4.2 of Project Co's Proposals (Design Management), which refers to an appendix, being "design management policies and procedures manual" to govern design management during the construction phase (page 269).

may allow this document to be cross-referenced to the Room Data Sheets, which include similar codes. The BCRs refer at various points to the Schedule of Accommodation without that being a defined term: it seems reasonable to assume that this is the document referred to. The Schedule of Accommodation is Reviewable Design Data (Part 4 of Section 5 of Schedule Part 6).

9. From page 261, what appears to be Project Co's Proposals proper appear. On pages 266 and 267, there is an index identifying the constituent sections, numbered from 4.1 through to 4.32.

Project Co's Proposals 4.1

10. Section 4.1 (from page 261) sets out the introductory part of the proposals which set them in context. It identifies, for example, Project Co's commitment to collaborative working to ensure the Board's requirements were met (page 263, paragraph 1.2). It identifies project meetings to take place during the construction phase, and their initial frequency (page 264).

Project Co's Proposals 4.2

11. Section 4.2 of Project Co's Proposals (Design Management) appears at page 268. This provides that Project Co, through its subcontractor Multiplex, would implement design management procedures during the construction phase in accordance with a design management policies and procedure manual. That manual apparently appears out of sequence, at pages 74 to 105, and is discussed above.

12. Section 4.2 also provides that information was to be communicated via the Aconex document management system, the manual for which also appears out of sequence, at pages 24 to 73, and is discussed above.

13. This section deals with Room Data Sheets. It explains that a number of room data sheets were contained elsewhere in the Project Agreement (they appear at the Schedule Part 6 (Construction Matters) Section 6 (Room Data Sheets) Appendix 1 (RDS Pack)), and that "*[t]he remainder … shall be completed using the reviewable design data mechanism contained in the Project Agreement*" (page 269).

14. The section also provides for the design review process, as follows: "*Project Co shall procure the management of the design through the processes and timeframes as Schedule Part 8 'Review Procedure' of the Project Agreement. Specific details of process and tools used to assist in the control of design are set out in the Design Management Procedures and Aconex User Manual (see appendices 1 and 2 to this PCP Section)"*.

15. The section stated that Project Co would develop with the Board a number of tracking registers, including one for Reviewable Design Data (page 269). These registers were to set out the deliverables and would be linked to the construction programme for design and construction.

16. A flow diagram at page 270 shows the procedure for submission of reviewable design data by consultants or subcontractors to Project Co, and by Project Co to the Board, for review and sign off.

17. The section also provides that "*IHSL shall continue to work with the consultants to the D&C contractor to ensure that the risk of infection and its spread will be considered as part of the design development process*" (page 270). A following passage, which the syntax renders unclear, provides "*Engagement with user groups will continue where Project Co with the Board will conclude Board FM related operational issues such as: … Spaces with special ventilation needs (e.g., in theatres, isolation rooms and specialist departments)*" (page 270).

18. It also provides: "*Communication protocols through established links shall be in place to ensure transparency. Project Co's design management process shall ensure the Board and its other stakeholders are fully integrated into aspects of the design as required to ensure the design as it develops through the RDD process reviewed and approved by the Board all in accordance with Schedule Part 8 (Review Procedure)*" (page 270).

Project Co's Proposals 4.4

19. Section 4.4 of Project Co's Proposals (Architecture & Landscape) appears at page 343. At 2.1, under the headings "Project Wide Requirements" and "Approach to Design", it provides: "*Project Co shall create a non-institutional patient centred and safe building that shall provide appropriate facilities to support all the required clinical needs. …*".

20. At 3.5.2, under the heading "*Clinical and non-clinical functionality*", it provides: "*Project Co has worked with the Board through a series of user group meetings to ensure clinical and non-clinical functionality of every room within the*

Building. For Operational Functionality refer to Series 400 (1:50 Equipment Drawings series).”

21. At 3.6.1 (page 363), under the heading “*Floor Layouts*” it provides “*Project Co has completed three rounds of user group meetings developing Operational Functionality for the hospital in collaboration with the users. Project Co has incorporated the requirements of the key rooms and generic rooms which were provided as a mandatory requirement and taken cognisance of the changes to the equipment list.*

Some of the more complex rooms were also created as c-sheets to assist users in visualising the rooms within their department.

Project Co shall provide a list of key, generic, and specific rooms which will be submitted as part of Reviewable Design Data process to ensure operational functionality of all rooms. This will ensure that the c-sheets are developed in the correct sequence within the programme and that all service requirements are integrated within the Reviewable Design Data proposals.”

22. Paragraph 3.6.3 provides, under the heading “*Room data sheets*” that “*Project Co shall provide fully developed room data sheets submitted to the Board as Reviewable Design Data for review by the Board in accordance with Schedule Part 8 (Review Procedure) and Clause 12.6 (Board design approval) of the Project Agreement*”.

23. Paragraph 5.2, under the headings “*General Construction Requirements*” and *“Infection Prevention and Control*” provides: “*Project Co has incorporated the comments and requirements of the Board’s infection control team, as a*

member of the team has attended meetings or has reviewed the room layouts throughout the whole of the UGM process.

Project Co has worked on the assumption that Development Stage 1 of the HAI-SCRIBE process has already been implemented and completed by the Board and their technical advisory team and the following comments are therefore restricted to any design issues relevant to the current status of the scheme, which equates to part completion of Development Stage 2.

It is at this stage that we are required to identify any hazards associated with potential HAI risks and consider any measures which might be required to mitigate and manage them.

The following factors have been carefully considered as part of our design process:

- *review of any features of the design or operation of the building likely to cause spread of infection relative to the patient population groups involved …*
- *ventilation systems …*

Project Co has ensured that infection control principles are incorporated in our design, drawing on national guidance particularly 'infection control in the build environment: design and planning (SHFN30 version 3). Project Co has incorporated the following features within the design to minimise the spread of infection …

- *appropriate heating hvac systems including filtration …*"

At 5.26, there is a section dealing with BREEAM.

Project Co's Proposals 4.9

24. Section 4.9 of Project Co's Proposals (Mechanical & Electrical Engineering) appears at page 1499. Perhaps surprisingly, it makes no more than passing reference to ventilation.

25. In paragraph 1, under the heading "*M&E Design Proposals*", it provides as follows:

"*The mechanical, electrical and public health services are designed to provide efficient, safe, secure services in accordance with the BCR's, British standards, CIBSE guides and the NHS guidance documents.*

The service routing and spatial co-ordination has been undertaken through the use of Building Information Modelling (BIM). This is an interactive process and the team will continue to develop this through the detailed design and pre-construction stages to ensure the full benefits of BIM for both the Construction phase and Operational Term.[28]

…

The environmental matrix indicates the main M&E design criteria, refer to room data sheet section of PCP for details."

26. Ventilation distribution drawings, and ventilation plantroom drawings, are referred to at pages 1558 and 1559.

[28] It is not clear whether or not this is relevant to the Inquiry. The reference to *"spatial co-ordination"* could include relative pressurisation of neighbouring rooms. If BIM is relevant, it is the subject of more detailed provision in the Project Co's Proposals.

27. From page 1567, there is an Indicative Vendor Schedule for Mechanical and Electrical Services. It provides:

"The following schedules identify the current lists of proposed Mechanical & Electrical Suppliers and Subcontractors. These lists will be developed during the detailed design stage and will be amended and updated to reflect the Mercury procurement process.

Revisions to names of Suppliers and Subcontract packages will be provided during the Reviewable Design Data (RDD period of the programme)."

Project Co's Proposals 4.10

28. Section 4.10 of Project Co's Proposals (Sustainability and Energy Model) appears at page 1572. It deals generally with the energy efficiency of the building. If energy conservation targets were a factor in the specification of lower than required air change rates, this section may be relevant for further consideration.

29. At page 1578 (paragraph 2.3.1, under the heading "*Passive Design"*), it states the following

"*Natural ventilation has been incorporated and working in conjunction with mechanical ventilation (mixed mode ventilation) for perimeter rooms in the facility. The natural ventilation is to be operated through openable windows. The strategy is to use natural ventilation whenever it is feasible or desirable, to maximise comfort. … Details of rooms designed with mixed mode ventilation refer to the*

electronic document "RHSC DCN IHS Lothian Operational Energy Model Input Data – Financial Close"."[29]

Project Co's Proposals 4.11

30. Section 4.11 of Project Co's Proposals (BREEAM Assessment) appears at page 1757. This may be relevant for further consideration for similar reasons to those identified in the preceding section.

31. Paragraph 2.1 notes: "*The Facility is required to undergo assessment and certification against the BREEAM environmental assessment method. The target requirement for the project is to achieve a 'Very Good' rating, with a minimum of 6 credits achieved for Ene 01 Reduction of CO_2 emissions, as agreed with the Scottish Government"*.

Project Co's Proposals 4.16

32. Section 4.16 of Project Co's Proposals (Commissioning) appears at page 2008. It requires Project Co to do, or to procure, the testing, pre-commissioning, commissioning and handover process for the building services at the Facilities in accordance with the requirements of the Project Agreement (page 2009). That would seem likely to include the ventilation systems, but the list of mechanical and electrical systems said to be under the commissioning scope (whilst not exhaustive) does not list ventilation (see page 2012).

33. It provides (page 2009): "*The process described shall ensure that a logical and methodical approach is taken to*

[29] This document has not been considered.

the commissioning process, which shall in turn ensure that all installed services are tested, verified and certified in line with the Project programme, design requirements and relevant codes of practice (BS EN ISO, CIBSE, BSRIA, SHTM etc). The process also confirms how Project Co shall manage snagging and any construction defects that might arise pre and post construction completion. …

The Independent Tester will undertake all work necessary to permit the issue of certificate(s) of practical completion, commissioning completion certificate(s) and snagging notice(s) in accordance with and as required by the Project Agreement."

34. At paragraph 5.2, under the heading "*Design*", it provides: "*The building services shall be designed so that they can be commissioned in accordance with the Board's Construction Requirements and relevant codes of practice. …*"

35. At paragraph 5.3, under the heading "*Review*", it provides: *"Before the design stage is complete, a commissionability review shall be undertaken to ensure that all the designed systems can be commissioned correctly in an effective and efficient manner. This process includes reviewing the completion criteria along with the Outline Commissioning Programme, in an open forum with all stakeholders.*

As part of the review stage a workshop shall be held to bring together the collective experience of the commissioning team and look at any lessons that can be learned from similar projects which could add value to the Project."

36. At paragraph 5.4, under the heading "*Construction*", it provides: "*As construction and installation works commence and progress, quality assurance and compliance checks and inspections are carried out on the installations with any issues being documented on an electronic system. This shall ensure that the installations are as designed and shall meet the project requirements including readiness for testing and commissioning. …"*.

37. At page 2092, as Appendix 5 to the Project Quality Plan for the Construction Period, there is a project directory which identifies many individuals and their organisations.

Project Co's Proposals 4.21

38. Section 4.21 of Project Co's Proposals (Equipment Strategy) is at page 2107. "*Equipment*" for the purposes of the Project Agreement is defined by reference to the equipment listed in schedule part 11, and in particular Appendix 1 to that part. The Inquiry would welcome input on whether this is to any extent relevant to its Terms of Reference. The Appendix includes some references to ventilation, but they are limited and do not obviously relate to a comprehensive ventilation system (the entries include, for example, references to canopies for extract ventilation (page 37) and to ultra clean ventilation systems for operating theatres (page 45)). The first page of appendix 1, however, carries a note which reads: "*M+E Requirements to be reviewed by Engineer in line with Clinical Output Specifications & Design Development"*. That perhaps suggests the Appendix was intended to include equipment relating to building services such as the ventilation system, but didn't because the design for them had not yet been completed. Section 4.21 includes the following provisions:

a) "*Project Co shall procure, install and commission the Group 1 equipment in accordance with the BCRs and in line with current guidance and legislation / SHTMs / SHPNs etc*" (page 2109).

b) "*Project Co have created a database of project specific ADB sheets, as contained within the operational functionality schedule part 8. The signed off 1:50 room layouts take precedence over the equipment matrix. Any anomalies will be discussed and agreed. The equipment schedule will be expanded to allow for additional columns of responsibilities to be agreed between Project Co and the Board"* (page 2113).

Project Co's Proposals 4.23

39. Section 4.23 of Project Co's Proposals (Building Services) is at page 2674. It includes, between pages 2676 and 2725, the Common Mechanical Clauses, and between pages 2726 and 2791, the specification for the Ventilation Systems.

40. The common clauses include, at page 2723, provisions about the execution of mechanical commissioning. They provide, inter alia, that "*Project Co shall employ an independent commissioning engineer. The commissioning engineer shall be responsible for fully managing the commissioning process for the electrical and mechanical, public health … installations and shall carry out all necessary liaison with other Boards and specialist installers and compile the operation and maintenance manuals. …*"

41. The Specification for the Ventilation Systems (page 2726 onwards) provides, inter alia, as follows:

a) At 1.0 (page 2728) under the headings "*General Introduction"* and "*Purpose of Document"*, "*To carry out the development of the design, The Specialist shall obtain the necessary supporting documentation"*.

b) At 5.0 (page 2729) under the heading "*Applicable Standards*":

"*All elements of the works shall be in accordance with the requirements of current legislation, regulations and industry standards unless otherwise stated.*

The Ventilation System shall accord with all appropriate Hospital Technical Memoranda, Codes of Practice and relevant British and European Standards.

The equipment supplied shall confirm to all relevant standards and regulations in force. …".

c) At 6.0 (page 2780) under the heading "*Design Criteria*": "*For ventilation/air change rates used in the design, Project Co. shall refer to the ADB sheets.*"

d) At 7.0 (page 2730) under the heading "*Liaison*":

"*Project Co. shall include for liaison with:-*

Health and Safety Professionals. As well as the Health and Safety requirements of this specification,

Project Co. shall include for close liaison with Health and Safety professionals including the Hospital's Health and Safety Advisors and the CDM Co-ordinator and shall comply with the CDM Regulations and all Health and Safety Regulations. …

Any other member of the Project and Board teams concerned with the planning and administration of the Ventilation System."

e) At 8.0 (page 2730) under the heading "*System Description*": "*The mechanical ventilation and air conditioning systems shall comply with … SHTM 03-01, and descriptions and requirements set out below.*"

f) At 8.1 (page 2731) under the heading "*Background to Ventilation and Air Conditioning Installations"*:

"*The building is largely sealed with limited openable windows in order to control the internal environment within the spaces.*

The building ventilation is based on a mixed mode solution where it permits, utilising openable windows together with mechanical vent and a peak lop [sic.] cooling solution.

The hospital shall be mechanically ventilated:-

- *Throughout all internal rooms that have no access to natural ventilation*
- *Perimeter areas where mechanical ventilation is required for clinical reasons*

- *Perimeter areas where mechanical ventilation is required for operational and environmental control reasons*
- *Deep plan perimeter areas where necessary to assist the natural ventilation*
- *Ward areas throughout …*

Project Co shall supply and install services and equipment to perform as per specification. …"

g) At page 2734, under the headings "*U10 Ventilation Systems"* and "*All air systems"*:

"*Areas shall be controlled in zones or as individual rooms as necessary to achieve the conditions required by the ADB Sheets*. …

Air pressure regimes for theatre suites shall be designed in accordance with the guidance provided in SHTM 03-01 employing wall mounted pressure stabilisers. …

Relative air pressures between rooms shall be maintained to suit the activity concerned, by design of the supply and extract air volumes, and use of pressure relief equipment where necessary to prevent cross infection or transfer of unpleasant odours between areas, as required by the ADB sheets.

Heat recovery shall be provided between the supply and extract systems. The hospital ventilation systems shall be in accordance with SHTM 03-01

Ventilation in health care premises, DW 144 and DW 143. … "

h) Provision for ventilation of Isolation Rooms is provided at page 2735, by reference to SHBN 04, and for Operating Theatres with reference to SHTM 03-01.

i) At page 2737, under the heading "*Critical Care Departments*":

"*Critical care departments such as ITU/HDU shall be provided with dedicated ventilation systems. …*"

j) At page 2757, under the headings "*U81 Air Handling Units*" and "*310 Air Handling Units*": "*The supply and extract air handling plant shall in all respects comply and align with the requirements and recommendation detailed within the Health Technical Memoranda, in particular SHTM03-01 and 08-01, except where specifically noted within this specification.*"

Project Co's Proposals 4.24

42. Section 4.24 of Project Co's Proposals (Schedule of Drawings – Financial Close) appears at page 3426.

Project Co's Proposals 4.25

43. Section 4.25 of Project Co's Proposals (Operational Design Considerations) provides, at page 3435, under the heading "*Control of Infection*" inter alia: "*Project Co shall ensure that the risk of infection and its spread has been considered in the design and construction solutions. …*".

44. At page 3573, there is an Organisation Chart identifying people in various roles, including the Project Director (John Ballantyne), Project Construction Director (Alan Keeley), the Mechanical Services Manager (Ken Hall) and the M&E Commissioning Manager (David Wilson).

Project Co's Proposals 4.28

45. Section 4.28 of Project Co's Proposals (Health and Safety) addresses architectural matters at section 11 (page 3687). It notes that Project Co and its architects, HLM, had taken particular care to focus on, inter alia, the requirements set out in the clinical briefing documentation and the principles embedded in the reference design. It referred also to discussions during dialogue. It provides that "*We worked with the Board and our project team through a series of 1:200 user meetings to ensure that our proposals did not deviate from the mandatory operational and clinical functionality of the reference design.*" It noted that they had ensured that infection control principles were incorporated in the design; the key features for controlling infection were said to include ventilation. It noted that throughout the design process, they had continued to ensure that theatres were designed with ultra clean ventilation and engineered to ensure air pressures were managed to minimise the risk of airborne contamination. It provides (page 3689): "*The environmental conditions within the Facility are controlled to ensure high levels of comfort to the occupants, overall energy efficiency of the system and also infection control needs and other clinical requirements as prescribed in the SHTMs"*.

Project Co's Proposals 4.30

46. Section 4.30 of Project Co's Proposals (Partnership and Collaborative Working), from page 3782, sets out an aspirational, and non-legally binding, partnering ethos. This includes the statement that "*[t]he parties expect and require a truly collaborative approach that shall embrace the concept of the public and private sector working seamlessly for one common goal.*"

Project Co's Proposals 4.31

47. Section 4.31 of Project Co's Proposals (Derogation Resister) appears at page 3859. It includes entries relating to the Environmental Matrix (entry 33) and Mechanical Ventilation / Air Conditioning (entry 35).

48. The Derogation Request relating to the Environmental Matrix is at page 3884. It states: "*Anomalies within the environmental matrix have been reviewed and proposals incorporated within the room data sheets (refer to schedule for proposed variations). This shall be further developed in conjunction with the board on the basis of the schedule of comments contained in Section 5 (RDD) Part IV* [30]."

49. The Derogation Request relating to Mechanical Ventilation and Air Conditioning (page 3886) provides, inter alia, that "*Air Handling Units for Theatres, Critical Care and High Dependency Unit areas to be fitted with space for future humidification. (In compliance with SHTM03-1)*". The Derogation Requests are marked as approved by Brian

[30] This is apparently a reference to Schedule Part 6 (Construction Matters) Section 5 (Reviewable Design Data), Part 4. As discussed elsewhere in this note, that section sets out Reviewable Design Data which was unapproved at Financial Close and the subject of comment by the Board. That category of Reviewable Design Data included the Environmental Matrix, and comments about it are listed in Part 4.

Currie on behalf of NHSL and Liane Edwards-Scott as design manager for Multiplex.

APPENDIX 3: Reviewable Design Data

1. "*Reviewable Design Data"* is defined in Schedule Part 1 as "*the Design Data listed at Section 5 (Reviewable Design Data) of Schedule Part 6 (Construction Matters)"*.

2. That Section does not form part of the Conformed Copy of the Project Agreement available to the Inquiry, and is said to be "*as set out on the disc in the Agreed Form identified and executed as the Section 5 (Reviewable Design Data) of Schedule Part 6 …*".

3. Section 5 is divided into four parts, numbered 1 to 4.

4. Part 1 is entitled "*Endorsed RDD Item – Level A or Level B but subject to re-submission to the Board through Schedule Part 8 (Review Procedure)"*. The table in that part runs for 25 pages. None of the entries has any obvious relationship to ventilation. The Inquiry would welcome confirmation of its impression that none of the entries bear upon the Inquiry's Terms of Reference.

5. Part 2 is entitled "*Non-approved RDD Items – Level C or Level D*". It provides: "*Project Co shall submit and the Board shall review the following Reviewable Design Data not approved at Financial Close given that such Reviewable Design Data only received a Level C or Level D at Financial Close, with such Project Co submission addressing the following Board comments in relation to such Reviewable Design Data. These comments shall be incorporated into each relevant drawing by Project Co, and the drawings shall be submitted by Project Co to the Board through Schedule Part 8 (Review Procedure).*"

6. The table in that part runs for 66 pages. It carries various references to ventilation. The Inquiry would welcome views on whether or not any of these are relevant to the Inquiry's Terms of Reference.

7. A comment on page 45 (by reference to drawing WW-SZ-00-PL-524-001) notes, inter alia, "*General comments – Drawing significantly lacks detail in order to provide a suitable review. Drawing purely shows main duct run locations. No ancillaries (fire dampers, attenuators etc.) shown and no room detail provided (grille types, locations, connections). This is all required for each room or various typical details to be provided to Board's satisfaction. … Full design to be in line with all PCPs*[31]*, BCRs, manufacturer's guidance and SHTM requirements …"*. That general comment is then adopted in relation to various subsequently-listed drawings. It indicates that the design for the ventilation system was not sufficiently developed for the Board to comment on the design. There are other entries relating to ventilation in respect of which the comments are different.

8. Part 3 is entitled "*Reviewable Design Data"*. It provides:

> "*Project Co shall submit and the Board shall review the following Reviewable Design Data not provided to the Board nor approved by the Board at Financial Close.*
>
> *This Part 3 of Section 5 (Reviewable Design Data) of Schedule Part 6 (Construction Matters) sets out the*

[31] Project Co's Proposals: defined in Schedule Part 6 (Construction Matters) Section 3 (Board's Construction Requirements) Sub-Section B: Definitions and Abbreviations.

details of the specific design information, materials, samples and required approvals (as more specifically set out in the table below) ("Reviewable Design Data") to be reviewed by the Board in accordance with Schedule Part 8 (Review Procedure) before such Reviewable Design Data is incorporated into the Facilities and/or the Site by Project Co.

If Project Co subsequently revises or amends its Project Co's Proposals in relation to the Room Data Sheets and/or Reviewable Design Data, then such revisals or amendments shall require to be issued to the Board for review under Schedule Part 8 (Review Procedure).

Any items referenced in the Section 3 (Board's Construction Requirements) and Section 4 (Project Co's Proposals) of Schedule Part 6 (Construction Matters) relating to Schedule Part 8 (Review Procedure), to comments such as "shall be reviewed as Reviewable Design Data" or "to be agreed with the Board", shall be deemed as Reviewable Design Data to be submitted through Schedule Part 8 (Review Procedure).

Following the date of this Agreement:

- *Project Co shall submit a programme of issue dates for Reviewable Design Data set out in this Part 3;*

- *Project Co shall ensure that such programme shall show the items of Reviewable Design*

Data forecast to be submitted to the Board within the next 3 months;

- *Project Co shall revise and reissue the programme on a monthly basis so as to maintain a rolling 3 month look ahead from each date of issue*

Project Co recognises this aspect of the Reviewable Design Data process is still to be agreed and further acknowledges the practicalities for the Board co-ordinating and undertaking the reviews of Reviewable Design Data. Project Co shall ensure that no changes to the first month of each revised 3 month programme shall be made without the prior approval of the Board, and the Board shall approve or reject any Project Co proposal for such a change within 5 Business Days of receipt of the Project Co proposal, failing which the Board shall be deemed to have approved the change.

Project Co shall take reasonable endeavours to sequence the release of information in a manner so as to mitigate the volume of parallel reviews required to be undertaken by the Board pursuant to the Review Procedure."

9. There then follows a table which runs to 9 pages. The table is incomplete, lacking drawing numbers and dates for submission and review. The table entries include the following items of Reviewable Design Data which may be relevant for the Inquiry to consider:

a) A1 Room Data Sheets;

b) A14 Detailed specifications for all mechanical and electrical components;

c) A45 Details for the control of infection;

d) H8 Air handling systems;

e) 1:200 Primary distribution for all areas indicating main distribution routes and plant locations with respect to the following: …

    i) I3 Ventilation;

f) 1:50 Detail layouts for all areas for the following …

    i) J4 Ventilation.

g) After section K, the table reads "*Such supporting calculations, schedules and information, as requested by the Board to support items above*."

10. Part 4 is entitled "*Non-Approved Project Co's Proposals Design Data comments".* It provides:

> *"Project Co shall submit and the Board shall review the following Board comments in respect of relevant Project Co's Proposals*[32] *(which shall be deemed to be Reviewable Design Data) not approved at Financial Close given that such Reviewable Design*

[32] It would appear something has gone awry with the drafting here. If one takes it literally, it provides for Project Co to submit a Board comment to the Board for the latter's review. The Inquiry Team is proceeding on the basis that it was intended to provide that Project Co was to submit proposals to address the Board comments listed in the table. That would therefore, for example, appear to require Project Co to submit an updated version of the Environmental Matrix to address the Board comments listed in the table. It would be helpful for CPs to provide views on this issue.

Data only received a Level C or Level D at Financial Close, with such Project Co submission addressing the following Board comments in relation to such Reviewable Design Data.

These Board comments shall be incorporated into each relevant item of Design Data (which shall primarily relate to drawings accompanying the relevant Project Co's Proposals) by Project Co and the drawings shall be submitted by Project Co to the Board through Schedule Part 8 (Review Procedure).

If Project Co considers that the Board comments below on any of the items listed in this Part 4 amount to a Change, Project Co shall, before complying with the comments and resubmitting the Endorsed RDD, notify the Board of the same and, if it is agreed by the parties or determined pursuant to Schedule Part 20 (Dispute Resolution Procedure) that a Change would arise if the comments were complied with, the Board may, if it wishes, implement the Change and it shall be dealt with in accordance with Schedule Part 16 (Change Protocol).

11. There then follows a table running to 11 pages. The Inquiry would welcome views on which entries are relevant to its Terms of Reference. One entry which is plainly relevant is for the Environmental Matrix, in relation to which the following is provided:

"Project Co shall update the Environmental Matrix to reflect the following Board comments

- *The Environmental Matrix shall by* [sic.] *updated by Project Co to reflect all the rooms and room types in the proposed Facility, this should be based on an updated Schedule of Accommodation*[33] *that has been commented on separately by the Board. This also needs to reflect the names and room numbers in the GSU table*[34]*.*

- *Include the requirements contained in the Clinical Output Specification*[35] *including but not limited to the requirement that theatre temperatures are to be able to be raised to 31°C for certain operations*

- *Measures shall be assessed, modelled and implemented to demonstrate that the internal air temperature of the following room types to reduce* [sic.] *the temperature control from 28°C to 25°C;*

    - *Treatment Rooms;*

    - *Consulting Rooms;*

    - *Laboratory;*

[33] "*Schedule of Accommodation*" is not defined in the Project Agreement definitions schedule (schedule part 1), or in the definitions section of the Board Construction Requirements. It appears, however, to be the document at pages 150 to 241 of Project Co's Proposals, discussed above.

[34] The Inquiry understands that "GSU" stands for "Gross Service Units".

[35] This would appear to be a reference to the contents of schedule part 6 (Construction Matters) section 3 (Board's Construction Requirements) Sub-section D (Specific Clinical Requirements), wherein the individual elements are entitled "[Department Name] Clinical Output Based Specification".

- *Physiotherapy Studio;*
- *Recovery.*

These room [sic.] *shall not exceed the maximum acceptable level of 25°C for more than 50 hours per annum*

- *Detailed proposal awaited on bedroom ventilation to achieve balanced/negative pressure relative to corridor.*
- *…*

12. The final entry in the table is for "Schedule of Accommodation" and reads:

> *"Project Co shall update the Schedule of Accommodation to reflect all of the individual elements of the proposed Facilities in accordance with Good Industry Practice.*"

13. As noted above, it is not clear what is meant by "Schedule of Accommodation", as it does not appear to be a defined term, but a document with that title appears at pages 150 to 241 of Project Co's Proposals. Since the Environmental Matrix was itself to be updated by reference to an updated Schedule of Accommodation, it would appear to be relevant to the Inquiry's Terms of Reference.

APPENDIX 4: Room Data Sheets

1. "*Room Data Sheets"* is defined in Schedule Part 1 as having "*the meaning given in Section 6 (Room Data Sheets) of Schedule Part 6 (Construction Matters)"*.

2. That Section does not form part of the Conformed Copy of the Project Agreement available to the Inquiry, and is said to be "*as set out on the disc in the Agreed Form identified and executed as Appendix 1 (RDS Pack) … of Section 6 (Room Data Sheets) of Schedule Part 6 …*".

3. On its first page, the document carries the note: "*Room Data Sheets for Generic and Key Rooms for Financial Close*"; is marked "*Revision 01*"; and is dated 18 September 2014. It runs to 572 pages of individual room data sheets, each of which relates either to a Generic Room or a Key Room[36] and carries both a code and a room number. An inventory of the Generic Rooms and Key Rooms is included at the beginning of the document. The Room Data Sheets themselves carry two dates: 17 and 18 September 2014. Each appears to be in the usual form and carries, at the bottom, the wording "*Department of Health Activity Database"*. Each includes a sheet of Room Environmental Data which sets out parameters for ventilation (including supply and extract air changes per hour and pressure relative to adjoining spaces).

4. Paragraph 3.6.3 of the Board's Construction Requirements and section 4.2 (page 269) and section 4.4, paragraph 3.6.3 of Project Co's Proposals indicate that this is an incomplete set of the room data sheets required for the hospital. The

[36] The difference between these two categories is not apparent from this document.

remainder were to be produced by Project Co for review by the Board under the schedule part 8 review procedure.

5. The Inquiry would welcome views on which, if any, of the Room Data Sheets are relevant to its Terms of Reference.

SCOTTISH HOSPITALS INQUIRY

Hearing commencing 24 April 2023

Bundle 11 – Provisional Position Papers

A43042036