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.

Contents

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.