SCOTTISH HOSPITALS INQUIRY

Hearing Commencing 26 February 2024

Bundle 12 – Substantive Core Participant responses to Provisional Position Papers – Volume 1 (of 3)

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RESPONSE ON BEHALF OF NHS LOTHIAN

TO THE PROVISIONAL POSITIONING PAPER 6 (PPP6)

ON COMMISSIONING AND VALIDATION ISSUED BY THE SCOTTISH HOSPITALS INQUIRY

(Submitted on 25 August 2023)

1. Introduction

1.1. The table in appendices 1 and 2 sets out NHS Lothian's response to the specific questions asked by the Scottish Hospitals Inquiry in its Provisional Positioning Paper on the commissioning and validation process utilised for the Royal Hospital for Children and Young People and Department for Clinical Neurosciences (PPP6). NHS Lothian would like to provide the following comments to provide the Inquiry with the relevant background and context to the legal, commercial and technical issues that arise out of PPP6.

2. Legal & Commercial – background to Supplemental Agreement ('SA1')

2.1. SA1 was signed on 22 February 2019 and documents the Heads of Terms which were agreed between NHS Lothian (NHSL or Board) and IHS Lothian Limited (IHSL or Project Co) on 19 December 2018, following a protracted 18 month period of negotiation between the parties. SA1 was mainly a commercial resolution to move the Project forward but it also reflects the positon agreed on derogations on key technical issues and documents additional works required to enable the hospital to be ready for validation prior to patient occupation.

2.2. The paragraphs below summarise the key terms of SA1 but further detail can be found in the SA1 Narrative submitted to the Inquiry for information[1].

2.3. The key terms of SA1 are as follows:-

2.3.1. IHSL obliged to procure the design, build, test and commissioning of the Post Completion Works including detailed technical specifications and operational procedures by agreed programme dates;

[1] Overview of Supplemental Agreement (SA1) Narrative with index reference SA1 001

2.3.2. A new Event of Default added to the Project Agreement entitling NHSL to terminate pursuant to clause 40.3.1 of the Project Agreement (i.e. automatic termination) in the event that Final Certification of the Post Completion Works was not granted by the Independent Tester by 26 July 2019, subject to any Delay Events;

2.3.3. Solutions to other disputed technical issues offered and accepted by NHSL formed part of a Technical Schedule to the Settlement Agreement and IHSL obliged to comply;

2.3.4. NHSL pay Project Co £6 Million on signature of the Settlement Agreement. The cash was utilised to replenish the Debt Service Reserve Account held by the funders to 100% of contractual requirement;

2.3.5. NHSL retain £5.6 Million to be paid as follows:

- Certification by IT in relation to completion of the Drainage solution – £2 Million;
- Certification by IT in relation to completion of Void Detection – £2 Million;
- Certification by IT in relation to completion of Heater Batteries – £1.6 Million;

2.3.6. NHSL commence payment of the full Annual Service Payment on the Actual Completion Date, that is all other Works less the Post Completion Works and some other Outstanding Works, which were key to completion of the Facilities. Accordingly, the Payment Mechanism applied to the Services (other than the Post Completion Works / Outstanding Works). In relation to the Post Completion Works and Outstanding Works, once these works were completed Service provision commenced and deductions applied for any failure to provide the Services from the relevant target dates for the Post Completion Works and Outstanding Works;

2.3.7. The Service Provider commenced provision of the Services (other than Services to the Post Completion Works, Outstanding Works and Amended Services) on the Actual Completion Date and NHSL commenced commissioning;

2.3.8. IHSL invested sub-debt and reinvested distributions. In addition to the reinvestment of distributions and injection of additional Sub-Debt, IHSL made a capital payment into the deal.

2.4. This commercial compromise was achieved following many months of negotiation to balance:-

2.4.1. NHSL's clinical imperative to ensure the facility was opened as quickly as practicable, whilst ensuring that all known defects were rectified to an accepted standard; and

2.4.2. IHSL's need to commence the operational phase of the facility and release Annual Service Payments to allow the servicing of debt.

2.5. These were key factors influencing the structure of SA1 and ultimately the decision of NHSL (with Scottish Government approval) to agree to the £11.2 million financial settlement, in return for IHSL agreeing to undertake the Outstanding Works and Post Completion Works within agreed timescales with associated incentivisation.

2.6. The negotiations on SA1 took place against a backdrop where, from 2016 onwards NHSL's project team and their technical advisors, Mott MacDonald Limited (MML), were identifying concerns over design and installation compliance. As a result, notwithstanding that the NPD contract is structured such that IHSL are fully responsible for design and construction (subject to Operational Functionality), NHSL and MML were undertaking a closer review of the design documentation submitted by IHSL than the contract required.

2.7. Similarly, as the Construction Phase progressed, it became clear to NHSL that the Completion Date, set out in IHSL's construction programme would not be met. Therefore, from June 2016, NHSL initiated formal correspondence with IHSL in relation to the slippage of the Programme. NHSL has submitted a narrative to the Inquiry which details the issues with the continuous slippages in IHSL' Contractual Programme and Completion Date[2]. From this point onwards, NHSL was heavily involved in the Construction Phase of the Project. Appendix 3 sets out a table analysis of the risks and benefits of entering in SA1 and a table of risks and benefits of the alternative, being dispute resolution via litigation or adjudication.

[2] NHSL Narrative for item 6.4 of RFI 1, Annex 1, submitted to the SHI on 16 July 2021.

3. SA1 Technical Schedule

3.1. SA1 technical schedule formally recorded the derogations that had already been agreed. In relation to ventilation, this included: (i) multi-bedded rooms derogated from 6ac/hr to 4 ac/hr; and (ii) single rooms derogated from 6 ac/hr to 4 ac/hr. These recorded derogations did not apply to critical care, which has a starting point of 10 ac/hr. There were no further ventilation works which required to be undertaken in respect of these items post practical completion on 22 February 2019. These ventilation systems had already been commissioned by IHSL by October 2018 and a Certificate of Practical Completion was issued by the Independent Tester in February 2019.

4. Technical

4.1. The terms “commissioning” and “validation” are often used interchangeably but they are two distinct phases[3]. Commissioning a ventilation system is the stage where component parts of the ventilation system are subject to engineering checks to determine whether it is operating as designed and each element can be commissioned in isolation. Responsibility for commissioning sits with the contractor who installed the system, in this case IHSL and Multiplex. NHSL took significant assurance from a letter of 31 January 2019 from IHSL to NHSL confirming that: All ventilation system have been designed, installed and commissioned in line with SHTM 03-01 as required.[4]

4.2. Validation can only occur when all the commissioning is complete, the area is free of construction, and cleaned by the contractor. Validation is at the very end of the whole process as a final check to make sure that the entire system and environment it serves are performing as anticipated and is ready for patient occupation. Responsibility for validation sits with NHSL, who instructed IOM as suitably qualified, independent Authorised Persons to carry out the validation of the ventilation systems at the RHCYP & DCN.

[3] Paragraph 3.3.10 of PPP6 quotes section from SHTM 03-01relating to commissioning. The section quoted in paragraph 3.3.10 is the validation statement from SHTM 03-01 not commissioning which is dealt with in the preceding paragraph in the guidance. Some of the additional text in this paragraph comes from a later part of the guidance dealing with ucv canopies.

[4] Note: paragraph 5.6 of PPP6 contains what NHSL assumes is a typographical error. It states that the response letter of 31 January 2019 does detail the derogations from SHTM 03-01 but it should state that it does not detail any derogations.

4.3. Under the terms of SA1, there were additional ‘post completion works’ and ‘outstanding works’ to be completed after Actual Completion Date on 22 February 2019. While the majority of these Works did not relate specifically to ventilation, the RHCYP and DCN was not the fully clean environment required for validation until around June 2019. There was a complex Joint Completion Programme that was dependent on Multiplex works being finalised by key dates but unfortunately, there was some degree of delay by Multiplex completing key works which had a knock on effect resulting in a delay in being able to clean and then validate the building.

4.4. It is also important to note that the term ‘commissioning’ covers both Project Co Commissioning and Board Commissioning as set out under Clauses 17 and 18 of the Project Agreement. As detailed above, the contractor is responsible for commissioning elements built/installed by them, which includes commissioning the ventilation system. The Board Commissioning elements are relating to the installation of NHSL equipment and is dependent on works in areas to be complete before Board Commissioning can commence.

5. Independent Tester

5.1. The Independent Tester Contract (IT Contract) is found at Schedule Part 13 of the Project Agreement and the Independent Tester (IT) scope of services is set out at Appendix 1 of the IT Contract. The IT provided services throughout the construction period, including attending monthly site progress meetings. In terms of its Scope of Services, throughout its Appointment the IT was obliged to:

5.1.1. Undertake regular inspections of the Works and report on the completion status of the Project, identifying any work that is not compliance with the BCRs, PCPs, the Approved RDD and/or Completion Criteria (clause 1.2);

5.1.2. Monitor the Works against the required standards of construction quality and Reviewable Design Data (clause 1.8);

5.1.3. Monitor the Works for compliance with the BCRs, PCPs and compliance with the Law (clause 1.9).

5.2. Clause 2.1 of the IT Scope of Services, obliged the IT to familiarise itself with the Project Agreement, including design data (which includes the EM) to the extent necessary to

enable it to provide a report to the NHSL and Project Co on any contradictory requirements. The Project Agreement specified mandatory compliance with SHTM 03-01, subject to any agreed derogations (there were no derogations in relation to critical care). The EM itself contains contradictory requirements in relation to critical care: the Guidance Notes to the EM state that critical care must comply with SHTM 03-01 but the body of the EM contains air change rates which do not comply with SHTM 03-01 (though refer back to the guidance notes). The IT did not ever flag this inconsistency to NHSL.

5.3. SA1 also varied the services the IT was required to perform including:

5.3.1. for Actual Completion Date to occur, the IT was required to certify as complete the Works (with exception of the Post Completion Works and Outstanding Works) as against the Completion Criteria as amended by SA1; and

5.3.2. the IT must subsequently certify as complete the Post Completion Works against the Post Completion Works Completion Criteria and the Outstanding Works against the Outstanding Works Completion Criteria as detailed in SA1.

6. Room Data Sheets

6.1. Room Data Sheets (RDS) were produced by IHSL at Financial Close and formed Section 6 of Schedule Part 6 (Construction Matters) of the Project Agreement. The RDS were unapproved at Financial Close and were subject to the RDD process. During construction, RDS were revised by IHSL, reviewed by NHSL and their Technical Advisors, MML, and updated by IHSL to reflect changes (as indicated on the revision sheet on the second page of the RDS). The majority of the final (also known as "As Built" RDS) are dated 18 October 2018 and have been produced to the Inquiry.[5] NHSL has previously provided commentary on IHSL contractual obligations to (i) comply with CEL 19 2010 and utilise the Activity Database to prepare RDS; (ii) comply with SHTM 03-01 as mandatory; and (iii) flag any inconsistencies to NHSL. While it appears IHSL did utilise the ADB to prepare the RDS, the critical care RDS contain the same non-compliant air change rates as IHSL's EM. IHSL would have required to manually alter the air change rates so that the compliant air change rates in the ADB were non-compliant in the RDS. At no point did IHSL flag any inconsistencies or non-compliances in critical care air change rate in either multi-bedded or single rooms to NHSL.

[5] As Build Room Data Sheets with index reference ABRDS_001 to ABRDS_062

6.2. The only design element which NHSL retained responsibility for was operational functionality. The Inquiry have acknowledged operational functionality does not include ventilation requirements. NHSL reviewed the RDS in relation to operational functionality only, i.e. the clinical aspects of the RDS such as medical equipment. NHSL's Technical Advisors, MML, reviewed the RDS in relation to technical matters, including ventilation. At no point did MML flag to NHSL that the RDS for critical care contained non-compliant air change rates for single rooms and multi-bedded rooms.

6.3. Compliance with RDS and the EM were not the only relevant contractual provisions in relation to ventilation requirements. Many additional contractual requirements were referred to and the key factor was compliance with SHTM 03-01 subject to any agreed derogations, which, in relation to critical care ventilation, there was not. NHSL has produced a response to PPP4 on the Project Agreement and the status of the Environmental Matrix and this response should be read in conjunction with that response, along with NHSL response to PPPs 1 – 3 and its Closing Submissions in relation to the SHI Hearings in 2022 and 2023.

Appendix 1

Response to Questions and Documents in Section 7 of PPP6

QUESTIONS and DOCUMENT REQUESTS		
7.1	Do you agree with the provisional conclusions of this paper? If not please provide correction or clarification.	NHSL does not agree with the provisional conclusions of PPP6. Appendix 2 contains a table with corrections and clarifications.
7.2	Are you able to provide the following documentation: • Room pressure differential test data, and IT approval of this, for AHU 04-06 and IEF03 – IEF06; • Any documentation illustrating that commissioning tests for AHU 04-06 were witnessed; and; • IT approval of commissioning tests for IEF03 – IEF05.	These should be provided by the Independent Tester, IHSL and Multiplex (MPX).
7.3	If applicable, please explain why room pressure differential tests were not conducted for AHU 04-06 and IEF03 - IEF06, and why commissioning tests for AHU 04-06 were not witnessed.	This should be answered by the Independent Tester, IHSL and MPX.
7.4	If room pressure differential tests were not conducted for AHU 04-06, why did the IT issue a Certificate of Practical Completion and Commissioning Completion Certificate?	This should be answered by the Independent Tester, IHSL and MPX.
7.5	If commissioning tests for AHU 04-06 were not witnessed, why did the IT approve the commissioning reports for AHU 04-06?	This should be answered by the Independent Tester, IHSL and MPX.
7.6	If no Room Data Sheets were produced reflecting the final agreed environmental information, how did paragraph 3.6.3 of the BCRs apply to the project?	As Built RDS were produced and dated October 2018. See paragraphs 6.1 – 6.3 above and the answer to question 7.7 below.

QUESTIONS and DOCUMENT REQUESTS		
7.7	With respect to paragraph 3.6.3 of the BCRs, what did the Board intend to be used as the basis for the 'functional requirements' of mechanical ventilation?	Whilst paragraph 3.6.3 of the BCRs is relevant, the other requirements of the BCRs, namely the referenced NHS technical standards, Good Industry Practice and the terms of the Service Level Specification are also relevant. Reference is made to clause B.2 of Appendix B (Service Quality Standards) of the Service Level Specification which requires Project Co to ensure:- • all heating and ventilation services shall function as intended, at the correct temperatures, pressures and flow rates, voltages and frequency, quality and standards without undue noise or vibration; and • air changes and ventilation levels as required to achieve the Availability Standards The relevant Availability Standard (A05) obliges Project Co to ensure that all Functional Areas in the facility are maintained such that the range of functional requirements for the proper use and enjoyment of the Functional Area for its particular purpose relating to air flow are the same as those specified in the Room Data Sheets. There are also other sections of the BCRs which are relevant to the commissioning process. Reference is

QUESTIONS and DOCUMENT REQUESTS		
		made in particular to paragraphs 4.5.17 and 8.15 which set out Project Co's obligations in relation to commissioning.
7.8	Why were the Certificate of Practical Completion and Commissioning Completion Certificate issued on 22 February 2019, when the commissioning and validation process was not yet complete?	IHSL and MPX commissioning of the ventilation system was complete in October 2018. As set out at paragraph 3 above, SA1 was the means by which derogations which had already been agreed in relation to the air changes from 6 to 4 in multi-bedded rooms and single rooms (not in critical care) were formally recorded. No further work and therefore no further commissioning was required. This meant the Independent Tester could sign off that the commissioning of the ventilation system was complete. As set out at paragraph 4 above, validation was not complete because it needs to be done (i) in a clean environment and (ii) prior to occupation by patients. Accordingly, validation could not occur until the SA1 Post Completion Works and Outstanding Works were complete and commissioned. Upon completion of the Works and prior to occupation by patients, IOM, the independent tester appointed by NHSL, commenced the validation process. IOM discovered that the critical care ventilation system did not comply with SHTM 03-01.

QUESTIONS and DOCUMENT REQUESTS		
		It should also be noted that during the negotiation period for SA1, the Board repeatedly made requests for up to date copies of Project Co's commissioning programme and reminded Project Co of their obligations pursuant to clause 17.[6]
7.9	Prior to IOM involvement, why was validation planned and/or sought for some areas such as single bed isolation rooms and UCV theatres, and not for others?	IHSL/MPX are best placed to answer this question. This validation was not undertaken at the request of the Board. It may have been a "dry run". NHSL instructed IOM to undertake validation on all specialist ventilation systems, including critical care, single bed isolation rooms and UCV theatres.
7.10	Why did NHSL not instruct an independent validation of the RHCYP/DCN's critical care ventilation systems before a recommendation to do so was made by the infection prevention and control team on 17 May 2019?	It was not possible to validate the critical care ventilation systems while the Post Completion Works and Outstanding Works were ongoing because it was not a clean environment ready for patient occupation. For example, in relation to the fire alarm void detection and heater battery/radiant panel work, this meant that ceilings in the rooms were down, ventilation systems switched off and there was construction dust and noise throughout entire building.
7.11	With respect to performance parameters, was the ventilation equipment serving critical care commissioned against a	This is best answered by MPX, IHSL and the Independent Tester. NHSL's understanding is that the ventilation

[6] NHSL Narrative for item 6.4 of RFI 1, Annex 1, submitted to the SHI on 16 July 2021.

QUESTIONS and DOCUMENT REQUESTS		
	standard other than SHTM 03-01? If so, what was this standard?	equipment serving critical care was to be commissioned against SHTM 03-01.
7.12	With respect to performance parameters, was the ventilation equipment serving critical care validated against a standard other than SHTM 03-01? If so, what was this standard?	IOM validated against SHTM 03-01.
7.13	The Inquiry hold IOM surveys predating 4 July 2019 for the following rooms: 1-B1-009, 1-B1-031, 1-B1-063, 1-B1-037, 1-B1-065, 1-B1-075, 1-B1-016. Please provide any remaining IOM surveys conducted for the Critical Care department prior to 4 July 2019 and which were available at the time the decision was taken to delay the opening of the hospital.	There are no remaining IOM surveys for the remaining rooms in critical care, being two single rooms 1-B1-020 and 1-B1-026. It is likely that these single rooms were not validated because, at this point, it became clear from the issues found elsewhere in critical care that IHSL, MPX and TUV SUD / Wallace Whittle had not designed or installed a ventilation system in critical care that they intended to comply with SHTM 03-01.

Appendix 2

	Table of clarifications on provisional conclusions	NHSL Response
6.2.1	The Project Agreement provided for Project Co to, as a minimum, commission the facilities in accordance with the 'Guidance to Engineering Commissioning'.	The Project Agreement provided for commissioning in accordance with relevant Guidance, in particular CIBSE.
6.2.2	The Inquiry team have not seen any Environmental Matrix or Room Data Sheets post-dating the Settlement Agreement of 22 February 2019, which appears to have effectively finalised the final contractual specification for ventilation.	As Built RDS were produced and dated October 2018. See paragraphs 6.1 - 6.3 above and the answer to question 7.7 below.
6.2.3	The Project Agreement also specified that, irrespective of the requirements in the Room Data Sheets, Project Co were to provide mechanical ventilation to suit the functional requirements of each of the rooms. It is therefore not known what the RHCYP/DCN contract intended to be used as the basis of commissioning data for mechanical ventilation. It is also not known what was used as the basis of this commissioning data in practice. The Inquiry team invite CPs to assist on this point.	See NHSL response to question 7.7. The RHCYP/DCN contract intended the design in critical care to comply with Guidance. The design calculations and compliance with Guidance should have been used as the basis of commissioning data for mechanical ventilation.
6.2.4	The essential purpose of ventilation commissioning is to verify that the equipment is capable of delivering the performance criteria required by the design. Ventilation commissioning is not ordinarily concerned with verifying performance criteria against healthcare	The term “equipment” is incorrect and suggest it is replaced with “ventilation system”. The IHSL design for critical care should have been based on healthcare guidance against which commissioning happens.

	Table of clarifications on provisional conclusions	NHSL Response
	guidance, although this may be included within the scope of meeting the 'safety requirements' referenced in SHTM 03-01 or the 'user requirements' referenced in SCIM.1	SCIM is not technical guidance. Safety requirements are normally interpreted as relating to interface with other systems, e.g. Fire.
6.2.5	The air change rate and room pressure differentials of each area were dictated by the AHU serving that area.	Disagree. The design of all components of the ventilation system including AHU should be established by the design to meet the requirements of the room air change rates and pressures in guidance and regulations as referenced in the Project Agreement.
6.2.6	In certain areas noted in Table 1, the air change rate and room pressure differentials were also dictated by a separate IEF	Disagree. The design of all components of the ventilation system including IEF should be established by the design to meet the requirements of the room air change rates and pressures in guidance and regulations as referenced in the Project Agreement.
6.2.7	Each AHU and IEF was commissioned by H&V	Agree though MPX best placed to answer. NHSL understand some systems and all commissioning certificates were witnessed and checked by the Independent tester.
6.2.8	The ventilation equipment relevant to the rooms in Table 1 was commissioned between February and October 2018. However, it appears the Settlement Agreement of 22 February 2019 finalised the specification for	It is correct that the ventilation system relevant to Table 1 was commissioned by October 2018. However, it is incorrect to say that SA1 finalised the specification for rooms in critical care. SA1 did not deal with critical care. See paragraph 3 above.

	Table of clarifications on provisional conclusions	NHSL Response
	these rooms, and required an alteration to the design of the four-bed rooms. It is therefore not clear to the Inquiry team how the earlier commissioning sits in relation to the later agreed specification. The Inquiry team invite CPs to assist on this point.	
6.2.9	However, in practice it appears the Certificate of Practical Completion for the RHCYP/DCN was issued before commissioning of the ventilation systems can have been completed. The Inquiry team invite CPs to assist on this point.	That is incorrect. Commissioning of the ventilation system was completed in October 2018, prior to the Certificate of Practical Completion being issued. As above, SA1 was the means by which derogations that had already been agreed in relation to multi-bed and single rooms from 6ac/hr to 4 ac/hr (i.e. rooms not in critical care) were recorded.
6.2.10	That Guidance also states that 'Works Staff' should be involved in the final witnessing and demonstration as part of the familiarisation process. This recommendation was reflected in the Services Contract between IHSL and BYES, who are understood to be the 'Works Staff' for the RHCYP/DCN project. However, in practice it does not appear that any parties witnessed the commissioning of the AHU relevant to the rooms in Table 1. The Inquiry team invite CPs to assist on this point.	IHSL / BYES best placed to answer.
6.2.12	As part of a provision to supply documentation to the IT, the Project Agreement included an expectation that Project Co would provide	This aligns with NHSL expectations that IHSL and their supply chain would following all appropriate guidance.

	Table of clarifications on provisional conclusions	NHSL Response
	commissioning documentation in accordance CIBSE Commissioning Code A.31 The Inquiry therefore understand that the contract expected commissioning to be carried out in a way that reflected the specifics of 'what should be done' in the Code. The contract therefore appears to align with the detail of the Code.	
6.2.13	The Inquiry team understand that measuring air volume flow rates and comparing these with the flow rates required by the design is a crucial aspect of commissioning, as evidenced by CIBSE Commissioning Code A, SHTM03-01 and evidence heard by the Inquiry. The Inquiry team also understand that volume flow rates are required to calculate air changes per hour.	Agree. However, it appears there was no reference to air change rates on IHSL' commissioning documentation. During validation, IOM had to carry out its own calculations to establish actual air change rate in comparison to guidance.
6.2.14 & 6.2.23	Irrespective of the purpose of commissioning to verify equipment performance against design criteria, the Inquiry team therefore understand that the commissioning phase may have offered an opportunity for the parties involved in commissioning to have sight of design and performance criteria that was later identified by IOM as diverging from healthcare guidance.	Suggest, "verify ventilation system" instead of "verify ventilation equipment". Otherwise agree, however this would have required a calculation to verify against air change rates and, as noted in response to 6.2.13, there was no reference to air change rates on IHSL's commissioning documentation. It should be recalled that responsibility for commissioning sits with IHSL supply chain. IHSL (or at least its m&e sub-contractors) considered its design was compliant with Guidance.

	Table of clarifications on provisional conclusions	NHSL Response
		As set out in paragraph 5 above, in terms of its scope of services during the construction of the Project, the IT had obligations to familiarise itself with the Project Agreement and associated design data and raise any contradictory requirements and non-compliances. It did not do so in relation to critical care.
6.2.15 6.2.21 6.2.22 6.2.22 6.2.23 6.2.24 6.2.30 6.2.31	The Inquiry team therefore understand that the IT may have possessed a certain level of awareness and expertise with respect to HTM and SHTM standards. The Inquiry team accordingly understand that this may have offered the IT a greater opportunity to identify design and performance criteria that diverged from healthcare guidance	The IT should have had and did possess awareness and expertise with respect to HTM and STHM standards. Indeed, as set out in paragraph 5 above, in terms of its scope of services during the construction of the Project, the IT had obligations to familiarise itself with the Project Agreement and associated design data and raise any contradictory requirements and non-compliances. The IT did not do so in relation to air change rates in critical care.
6.2.16	Where pressure differentials between areas are intended by a ventilation design, CIBSE Commissioning Code A recommends measuring and recording these between all adjacent spaces, and comparing the measurements with the specified design requirements. The Code states that, once acceptable conditions are obtained, it is imperative to record final balance figures including air volume flow 32 See pg 17 of the transcript of Mr. Poplett's evidence and	Where pressure differentials were noted in the design or EM these would be measured both at commissioning (on behalf of MPX) and at validation by IOM (on behalf of NHSL).

	Table of clarifications on provisional conclusions	NHSL Response
	Health Facilities Scotland, 'Scottish Health Technical Memorandum 03-01 Ventilation for healthcare premises Part A – Design and validation', (February 2014), para 8.33. rates and pressure differentials. These should then be verified by the accepting authority.	
6.2.17	Although the RHCYP/DCN contract appears to include a provision expecting the detail above to be followed, in practice it appears that no room pressure differentials were recorded, witnessed or approved for the rooms in Table 1.This was despite the design for these areas having pressure requirements relative to adjacent spaces. The Inquiry team invite CPs to assist on this point.	This is best answered by IHSL, MPX or the Independent Tester. It appears isolation rooms pressure differentials were measured and recorded.
6.2.26	The Inquiry team have not been able to locate any final draft or principal operation and maintenance manual for the project. However, operation & maintenance manuals for AHUs and fans have been reviewed.	For IHSL / BYES to answer as they had responsibility for this on the project. O&M records contained on Zutec database.
6.2.27	It is not clear if these manuals fulfilled the terms of the Project Agreement for provision of an operation and maintenance manual. It is also not clear if/when these manuals were submitted to NHSL and approved. It is therefore not clear whether the recommendations of the SCIM commissioning guidance were met.	For IHSL/BYES to answer as they had responsibility for this on the project. O&M records contained on Zutec database.

	Table of clarifications on provisional conclusions	NHSL Response
	The Inquiry team invite CPs to assist on these points	
6.2.28	BYES were trained to operate and maintain the equipment while witnessing equipment tests.50 Training was subsequently given to NHSL by BYES or Multiplex.51 For the AHU outlined in Table 1, it does not appear that any equipment tests were witnessed.52 It is therefore understood that no party was trained to operate and maintain this equipment. It therefore appears that the recommendation in SCIM commissioning guidance, that a facility handover cannot occur without fit-for-purpose and safe operation training, 53 was not met with respect to the AHU in Table 1. The Inquiry team invite CPs to assist on this point.	NHSL have no responsibility for the system, this is BYES responsibility. NHSL training was carried out only at the user interface i.e. room thermostats. NOT at AHU or other plant room or ventilation system equipment.
6.2.32	The essential purpose of ventilation validation is to verify that the system as a whole is fit for purpose. This is understood to mean that validation is, at least in part, concerned with verifying equipment performance criteria against healthcare guidance	Agreed and this is what was anticipated by NHSL. Suggest "verifying ventilation system performance" instead of "verifying equipment performance".
6.2.33	The Inquiry team have been unable to locate any specific provisions for the validation of ventilation equipment in the RHCYP/DCN contract documents. It is not known if this reflected standard or accepted practice at the time the relevant contracts were signed	Contained within SHTM 03-01 therefore part of the Project Agreement.

	Table of clarifications on provisional conclusions	NHSL Response
6.2.36	The Inquiry team have seen documents headed with the Multiplex logo, which indicate that single bed isolation rooms were validated on 6 June 2019 and signed off by Multiplex, Mercury and Arcadis.62 It is not clear from the face of these documents who carried out the validation in relation to the air change rate and room pressure differential data for these spaces. A 'Method Statement for H&V Commissioning Services Ltd' regarding 'Validation of Theatre Suites & Isolation Rooms' has been seen by the Inquiry team, which may suggest that H&V provided the validation, as well as the commissioning, of these rooms. The Inquiry team invite CPs to assist on this point.	IHSL and MPX are best placed to answer, this may have been carried out as a 'dry run'.
6.2.37	It is not clear at this stage why the single bed isolation rooms in Table 1 were validated on 6 June 2019. The Inquiry team invite CPs to assist on this point.	IHSL and MPX are best placed to answer, this may have been carried out as a 'dry run'.
6.2.38	The Inquiry team are aware that UCV theatres at the hospital were validated by MAT on 26 October 2018.63 This validation was carried out to verify that the installed system performed in accordance with SHTM 03-01. Validation reports produced by MAT were approved by Multiplex and Mercury on 29 October 2018. It is not clear to the Inquiry team why these areas were earmarked for validation	Validation cannot have been carried out to the requirements of SHTM 03-01, as this requires an assessment of the whole system, MATs part was only a component of the system. This was not an 'independent' validation; the independent validation was carried out by IOM for NHSL.

	Table of clarifications on provisional conclusions	NHSL Response
	prior to IOM's involvement in the project. The Inquiry team invite CPs to assist on this point.	
6.2.39	The remaining Critical Care areas in Table 1 do not appear to have been validated, independently or otherwise, prior to IOM's involvement in the project.64 It is not clear why these areas were not included in the validation that appears to have occurred prior to IOM's involvement. The Inquiry team invite CPs to assist on this point.	SHTM 03-01 requires that validation is carried out by an independent party on behalf of NHSL. This was not able to be done until June 2019 because critical care was not a clean environment due to the ongoing works. Please see paragraph 4 above and also answer to question 7.7.
6.2.40	In March 2019 HFS requested evidence from NHSL as to how the Board was assured that engineering systems including ventilation had been commissioned and validated to ensure safety, quality and compliance. NHSL responded that, among other things, this assurance had been provided by the provisions of the BCRs, the involvement of the IT, and the suite of testing and commissioning documentation approved by the IT	NHSL also took comfort from the 'assurance' letter from IHSL dated 31 January 2019, which pre-dates SA1 confirming that all ventilation system had been design, installed and commissioned in line with SHTM 03-01[7].
6.2.42	On 30 May 2019, IOM were instructed to independently validate the hospital's critical ventilation systems on behalf of NHSL. This step appears to have been taken in response to a recommendation from NHSL's infection prevention	There was ongoing dialogue with NHSL's IPCT in relation to validation (not commissioning) and the way IPCT wished the information to be presented to them. IOM were instructed by NHSL project team partly in response to that

[7] Note: paragraph 5.6 of PPP6 contains what NHSL assumes is a typographical error. It states that the response letter of 31 January 2019 does detail the derogations from SHTM 03-01 but it should state that it does not detail any derogations.

	Table of clarifications on provisional conclusions	NHSL Response
	control team, after concerns were raised in relation to the 'Theatre Ventilation Validation Checklist' referenced above	ongoing dialogue but also in accordance with the Guidance and further to discussions with HFS. It should not be surmised that validation would not have occurred had there not been any input from NHSL's IPCT. It was a collaborative process.
6.2.43	IOM's validation commenced on 17 June 2019. The RHCYP/DCN was scheduled to open on 9 July 2019. It is not known whether independent validation at this stage of a project reflects standard or accepted practice.	Validation cannot take place until construction activities and clean-up of the areas are complete; June 2019 was earliest possible once MPX finished major works. This reflects standard and accepted practice.
6.2.44	In an email to BSRAI, NHSL's Commissioning Manager Ronnie Henderson described a requirement on NHSL to independently validate critical ventilation systems at the RHCYP/DCN. This appears to reflect a recommendation in SHTM 03- 01, ostensibly brought to Mr Henderson's attention by Authorising Engineer Mr Minhinnick in an email of 20 May 2019. It is not clear to the Inquiry team why NHSL's references to validation prior to Mr Minhinnick's involvement are only in relation to theatres and isolation rooms. It is also not clear why NHSL instructed an independent validator in the manner and timeframe set out in this PPP. The Inquiry team invite CPs to assist on these points.	The timeframe was dictated by ongoing dialogue, ongoing completion works and unavailability of suitably qualified persons. The focus of discussions around this time were theatres and isolation rooms at the time. However, this is of no relevance to the final outcome because critical care was included in IOM scope of works and was validated by IOM.

	Table of clarifications on provisional conclusions	NHSL Response
6.2.45	IOM's validation activities included surveying UCV theatres, single and four-bed bays in HDU, isolation suites, recovery rooms and rooms within the neonatal unit. It is not clear why these specific areas were highlighted for assessment. The Inquiry team invite CPs to assist on this point.	These are critical ventilation systems under SHTM 03-01.
6.2.46	Of the 37 areas known to have been surveyed by IOM, 23 failed to achieve the air change rate and/or pressure differential standards recommended by SHTM 03-01. Of these 23 areas, seven were in Critical Care	Agree, however all areas other than critical care required adjustment only to achieve compliance, subject to agreed derogations.
6.2.48	It is possible that, if independent validation had been carried out sooner than June 2019, divergences between the performance of the ventilation equipment in Critical Care and the recommended standards in SHTM 03-01 would have been detected earlier.	Agree, however it couldn't have been done earlier due to extent of post completion works particularly for fire alarm void detection and heater battery/radiant panel work. Ceilings were down, ventilation systems switched off; construction dust and noise were evident throughout entire building.

Appendix 3

Table of Risks and benefits of entering in SA1

Benefits	Risks
The cost to NHSL is fixed: capital contribution and commencement of Annual Service Payments.	The programme to completion was challenging, but it included incentivisation for IHSL via milestone and longstop dates which ultimately permitted NHSL to terminate the Project Agreement if certain works were not completed by agreed dates.
The timescale to completion was more certain.	NHSL would require to manage its commissioning programme while construction works were ongoing. The mitigation for this was an agreed protocol and programme.
NHSL would be able to access the facility and commence Board commissioning[8] several months earlier than would be the case were it to wait until Actual Completion or until after litigation or dispute resolution had been completed.	The Agreement was subject to a range of conditions precedent, including approval of Scottish Government and funders.
A mutually acceptable settlement preserves the relationship between the parties.	Failure to agree all details will leave issues outstanding that are not catered for within the agreement, leaving open the risk of further dispute.
A settlement avoids an expensive, protracted and resource intensive process via the Courts or DRP	

[8] See paragraph 4.4: Board Commissioning is set out under Clauses 17 and 18 of the Project Agreement and does not include commissioning the ventilation system (which is the Contractor's responsibility).

Table of Benefits and Risks of a Formal Dispute Resolution Process

The alternative to agreeing the settlement would have involved NHSL undertaking a formal process, either through Court or adjudication. Some of the benefits and risks of a formal dispute resolution process considered by NHSL were:

Benefits	Risks
Clearly defined outcome.	The time it would take to complete such a process was uncertain and it was unclear what, if any, work would be performed on the disputed items during that period.
Outcome is enforceable on both parties and as such offers certainty of implementation once the outcome was known.	Resorting to this approach likely result in a range of other issues being included in the overall dispute by both parties, thus increasing the exposure to cost risk significantly.
NHSL's position in relation to the dispute would be maintained.	No certainty of success – the existence of contradictory QC opinions suggested that both parties had a robust case. NHSL's QC placed an estimate of 60% chance in favour of NHSL, based on the original areas of dispute.
The process would follow a clearly defined and understood route.	The cost of taking such action in terms of legal and advisory fees and management time would be high.
	The process could result in significant reputational damage for all parties.
	An adversarial approach could damage the partnership relationship between NHSL and IHSL during the 25 year contract period.

Scottish Hospitals Inquiry

Response by National Services Scotland to
Provisional Position Paper 6

1. In this short Response, National Services Scotland ("NSS") provides comments on Provisional Position Paper 6 ('The commissioning and validation process utilised for the Royal Hospital for Children and Young People and Department for Clinical Neurosciences').

2. With regards to the Provisional Position Paper as a whole, NSS notes that guidance has been updated over time. NSS does not know which versions of guidance applied in terms of the various contractual arrangements. This makes it difficult for NSS to take a view on whether particular matters were in compliance with the relevant guidance.

3. Para. 3.1.1 states that, "The Inquiry team acknowledge that the guidance referred to below was not written with privately financed or Non-Profit Distribution (NPD) projects, such as the RHCYP/DCN, in mind." For the avoidance of doubt, NSS notes that guidance was intended to apply irrespective of the procurement, contract or financing route. Reference is made, for example, to overarching engineering guidance, SHTM 00 (February 2013) at page 8:

   > *"Regardless of procurement route, whether by traditional means or through a Public Private Partnership (PPP), it is essential that, as part of the briefing process, those involved in the provision of the facility are advised that all relevant guidance published by Health Facilities Scotland (HFS) is available electronically for purchase from HFS."*

4. Paras. 5.27, 5.29, and 6.2.44, refer to "BSRAI." In fact, the name of this organisation is BSRIA [underline added].

5. With regards to the question posed in para. 7.1 ("Do you agree with the provisional conclusions of this paper?"), NSS notes that it is not in a position to agree or disagree

with many of the matters covered by the provisional position paper. In particular, the contractual arrangements between parties fall outside its knowledge and expertise.

6. NSS will be happy to provide further input and clarification as required.

National Services Scotland
25 August 2023

RESPONSE BY MOTT MACDONALD LIMITED

to

SCOTTISH HOSPITALS INQUIRY PROVISIONAL POSITION PAPER 6 – The commissioning and validation process utilised for the Royal Hospital for Children and Young People and Department for Clinical Neurosciences

1. In this paper Mott MacDonald Limited ("MML") seeks to respond to the various invitations made of Core Participants ("CP"s) in PPP6 and to identify some potential inaccuracies or misunderstandings in PPP6. To the extent that MML have been able to assist, this paper sets out MML's position on the various questions raised by the Inquiry.

Role of Room Data Sheets ("RDS") in Commissioning

2. At paragraph 6.2.2 it is provisionally concluded that "The Project Agreement provided for Project Co to commission the systems to comply with the Room Data Sheets." This is correct. However, this conclusion is inconsistent with incorrect statements elsewhere in PPP6 regarding the role of RDS in the commissioning process:

    2.1. At paragraph 2.1.3 it is stated, incorrectly, that "Room Data Sheets were not to be used as part of the commissioning process." This is not an accurate reflection of paragraph 3.6.3 of the BCRs, which provided "As part of the commissioning process, Project Co shall be responsible for demonstrating compliance with the requirements included within the Room Data Sheets." The Project Agreement accordingly expressly required the commissioning process to involve demonstrating compliance with the RDS (as PPP6 recognises at paragraph 6.2.2).

    2.2. This error is repeated at paragraph 3.2.11.

    2.3. This error is repeated at paragraph 4.2.13.

Application of paragraph 3.6.3 of BCRs in absence of RDSs

3. At paragraphs 4.2.12 and 7.6, CPs are asked to comment on how paragraph 3.6.3 of the BCRs applied to the project if no RDSs were produced reflecting the final agreed environmental information.

4. In considering this matter, it must be borne in mind that paragraph 3.6.3 of the BCRs is primarily concerned with RDSs: it is not primarily concerned with the overarching design criteria that IHSL required to comply with or with the commissioning process. It does not seek to set out comprehensive details of the applicable design criteria or the

commissioning process. It touches upon these issues only insofar as they relate to the RDSs.

5. MML submits that, in these circumstances, paragraph 3.6.3 of the BCRs applied as follows:

5.1. In accordance with the second paragraph of paragraph 3.6.3 of the BCRs, IHSL was obliged to provide fully developed RDSs.

5.2. In accordance with the first paragraph of paragraph 3.6.3 of the BCRs, IHSL was, as a minimum, to provide Facilities that met all the requirements specified in the RDSs. Plainly if no RDSs were provided, or if the RDSs were incomplete, such compliance would not be possible. In any event, regardless of whether RDSs had been produced, IHSL required to comply with the design criteria set out elsewhere in the BCRs.

5.3. In accordance with the fourth paragraph of paragraph 3.6.3 of the BCRs, it was made clear that, irrespective of the ventilation requirements in the RDSs, IHSL must provide mechanical ventilation to suit the functional requirements of each room. Even if no RDSs were provided, or if the RDSs were incomplete, it is therefore clear that IHSL was obliged to provide ventilation that complied with the functional requirements of the room (as discussed further below). This requirement applied irrespective of whether any RDSs were produced. This is consistent with the Hierarchy of Standards provision at paragraph 2.5 of the BCRs.

5.4. In accordance with the third paragraph of paragraph 3.6.3 of the BCRs, as part of the commissioning process, IHSL was to demonstrate compliance with the RDSs. Plainly if no RDSs were provided, or if the RDSs were incomplete, it would not be possible for such compliance to be demonstrated as part of the commissioning process. However, the commissioning process did not simply involve confirming compliance with the RDSs (as discussed further below).

'Functional Requirements' referred to at paragraph 3.6.3 of BCRs

6. At paragraph 7.7, CPs are asked to comment on what the Board intended to be used as the basis for the 'functional requirements' referred to paragraph 3.6.3 of the BCRs. NHSL would be best placed to comment on what its intention was. MML's position about what paragraph 3.6.3 of the BCRs means is set out in the following paragraph.

7. At paragraph 2.1.3, CPs are invited to assist in relation to what the 'functional requirements' were in relation to ventilation. These words are linked to the last sentence of paragraph 3.6.3 of the BCRs which refers to ventilation being provided "as appropriate to suit the function of the space". The functional requirements of a room are the use to

which the room is to be put and the clinical activities to be undertaken in it. This would be well understood by designers experienced in working on healthcare projects. The provisions in paragraph 3.6.3 of the BCRs must be read in the context that they form part of the BCRs. Paragraphs 2.3 and 8.1 of the BCRs expressly required compliance with SHTM 03-01. Table A1 at Appendix 1 of SHTM 03-01: Part A makes provision for specific ventilation parameters based on the particular function that a room was going to service (described in the Table as the "Application"). For example, if the function of a particular space was to be a "Critical Care Area" where critical care clinical activities were to be performed, the functional requirements, as set out in SHTM 03-01, would include 10 air changes per hour.

'Design Criteria' referred to at paragraph 2.1.4 of Schedule Part 10 Appendix B of the Project Agreement

8. At paragraph 2.1.9, CPs are invited to assist in relation to what is meant by mechanical ventilation design criteria. Paragraph 2.1.4 of Schedule Part 10 Appendix B refers to compliance with "the specified design criteria". This is a reference to the BCRs, the opening sentence of which (at paragraph 1) states "This document sets out the key design criteria…" Paragraph 8 of the BCRs specifies the particular design criteria for mechanical and electrical systems, including ventilation.

Inter-relationship between paragraph 3.6.3 of BCRs and paragraph 2.1.4 of Schedule Part 10 Appendix B of the Project Agreement

9. At paragraphs 2.1.3 and 2.1.9, CPs are invited to assist in relation to the inter-relationship between paragraph 3.6.3 of BCRs and paragraph 2.1.4 of Schedule Part 10 Appendix B. This request for clarification appears to be based on the Inquiry Team's understanding as set out in the first two sentences of paragraph 2.1.3:

> "The Inquiry team understand from the quoted section of the BCRs that the mechanical ventilation requirements in the Room Data Sheets were not to be used as part of the commissioning process. Rather, Project Co were to demonstrate compliance with the 'functional requirements' of the rooms."

10. For the reasons set out above, the understanding expressed in the first of these sentences is incorrect (and is in any event inconsistent with the conclusion at paragraph 6.2.2). The second of these sentences seems to proceed on the erroneous basis that the fourth paragraph of paragraph 3.6.3 of the BCRs (which refers to the 'functional requirements') relates to the commissioning process. On a complete reading of paragraph 3.6.3 of the BCRs, only the third paragraph concerns the commissioning process. This is understandable when one considers that paragraph 3.6.3 of the BCRs is primarily concerned with RDSs: it is not primarily concerned with the commissioning process. It touches upon the commissioning process only insofar as the RDSs are relevant to that process. The first paragraph of paragraph 3.6.3 states "Project Co shall provide Facilities

that, **as a minimum** [emphasis added], meet all the requirements specified in the Room Data Sheets". The second paragraph of paragraph 3.6.3 makes provision requiring IHSL to provide fully developed RDSs. The third paragraph of paragraph 3.6.3 makes reference to the commissioning process. The fourth paragraph of paragraph 3.6.3 then makes provision for Project Co to provide mechanical ventilation to suit the functional requirements of each of rooms, irrespective of the ventilation requirements in RDSs. There is no mention in the fourth paragraph of the commissioning process. Read in context, the fourth paragraph of paragraph 3.6.3 is not concerned with the commissioning process: it is stipulating the standard to which the ventilation system was to be designed and constructed, for the avoidance of doubt.

11. Understood in this context, paragraph 3.6.3 of BCRs and paragraph 2.1.4 of Schedule Part 10 Appendix B of the Project Agreement are entirely consistent. The latter stipulates that commissioning is to be done by reference to the specified design criteria (as set out in the BCRs); any manufacturers' operating requirements; and the RDSs. The former simply confirms that commissioning requires compliance with the RDSs: it is not seeking to set out a comprehensive list of the standards to which compliance had to be demonstrated.

12. The foregoing explanation addresses the invitations made at paragraphs 3.2.11, 4.2.13 and 6.2.3.

Absence of Contractual Provisions Concerning Validation

13. Paragraph 2.2.1 queries the absence of any specific contractual provisions for validation of ventilation equipment in the Project Agreement. In MML's experience, it is standard or accepted practice for validation of ventilation equipment to be performed by the Authorised Person ("AP"), also known as Authorising Engineer, appointed directly by the Health Board. This is consistent with SHTM 03-01, which states "Validation of these systems should therefore be carried out by a suitably qualified independent Authorised Person appointed by the NHS Board" (see paragraph 2 of the Note on page 114). There are no specific contractual provisions for validation of ventilation equipment in the Project Agreement because validation of ventilation equipment would not ordinarily be expected to form part of the obligations undertaken by a design and build contractor.

SHTM 03-01's Application as Commissioning Document

14. Paragraph 3.2.3 states that SHTM 03-01 is referred to in the Project Agreement as a design reference document as opposed to a commissioning document. MML considers that this is an erroneously narrow view of SHTM 03-01's application to the contract. The BCRs set out "the key design criteria and the core requirement" (see paragraph 1 of the BCRs). The BCRs include provision in relation to commissioning (see, for example, paragraph 8.15 of the BCRs). Paragraph 2.3 of BCRs stipulates that the Facilities "shall comply" with certain provisions, including SHTM 03-01 (see, in particular, paragraph 2.3v).

The wording of the BCRs does not limit compliance with SHTMs only to design issues: the guidance and advice must be taken "fully into account". There is accordingly no basis for the suggestion that IHSL did not require to comply with SHTM 03-01 in relation to commissioning.

Guidance on Critical Care Areas

15. Paragraph 3.7.2 notes that the Inquiry team are not aware of any detailed supplement relating to Critical Care areas. Although it is not a detailed supplement to SHTM 03-01, HBN 04-02 does cover critical care areas.

Role of Parties in relation to the Environmental Matrix

16. Paragraph 4.2.7 states that the EM was subject to further review and approval by IHSL and the Board of NHSL. This is an oversimplification of the parties' obligations in relation to the EM. Any approval of the EM by NHSL would relate only to those aspects relating to operational functionality in accordance with the requirements of the RDD process. MML has set out its position on parties' roles in relation to the EM in its Closing Statement following the last set of hearings.

Final RDSs

17. Paragraph 4.2.8 states that, as far as the Inquiry team are aware, no final RDSs were produced. It is MML's understanding that RDSs were produced, albeit at a much later stage that had originally been expected. RDSs for all rooms were issued in or around July 2017 and revised in November 2017.

Final Contractual Specification for Ventilation

18. At paragraph 4.2.11 it is stated that the final contractual specification for ventilation is constituted by version 11 of EM as amended by environmental information agreed in the Settlement Agreement dated 22 February 2019. This is incorrect. The contractual specification for the ventilation is set out in the BCRs (which, amongst other things, require compliance with SHTM 03-01 and includes the hierarchy of standards clause at paragraph 2.5). It may be more accurate to say that version 11 of EM as amended by environmental information agreed in the Settlement Agreement dated 22 February 2019 reflected IHSL's final design of the ventilation system: it is a separate question whether that design complied with the contractual requirements.

Derogations from SHTM 03-01

19. At paragraph 5.6 it is stated that the letter from IHSL dated 31 January 2019 "does detail the derogations from SHTM 03-01". Following correspondence with the Inquiry team, MML understands that this passage should read "The response does not detail the

derogations from SHTM 03-01." MML understands that this typographical error will be corrected in the published version of PPP6.

BSRIA

20. At various points in PPP6, reference is made to "BSRAI". MML note that the correct acronym is "BSRIA".

Other Matters

21. Based on its current state of knowledge, MML is unable to assist in relation to the various invitations and requests made in PPP6, in particular in section 7, except insofar as addressed in this response. MML may hold further relevant documents and would be happy to undertake further searches of its data if there are any specific requests from the Inquiry.

Clyde & Co (Scotland) LLP
25 August 2023

1 Introduction

1.1 The following is a response by Multiplex Construction Europe Limited ("**Multiplex**") to Provisional Position Paper 6, titled: *"The commissioning and validation process utilised for the Royal Hospital for Children and Young People and Department for Clinical Neurosciences*" issued by the Inquiry by e-mail dated 01 August 2023 (timed at 15.47) ("PP6").

1.2 Multiplex notes the terms of the e-mail issuing PP6, together with terms of the Inquiry's email of 27 July 2023 at 08.42 and the terms of PP6 itself, where the Inquiry highlights the importance of Core Participants understanding the factual basis on which the Inquiry is proceeding and having the opportunity to correct any misunderstandings or misapprehensions. Multiplex is grateful for this opportunity and to assist the Inquiry Multiplex would make the following submissions.

1.3 In the time available Multiplex has unfortunately not been able to respond to all points raised by the Inquiry and PP6. Multiplex would be happy to liaise with the Inquiry further with a view to identifying and responding to any remaining points.

1.4 Having regard to Section 2(1) of the Inquiries Act 2005, Multiplex's position set out in this Response is provided solely to assist the Inquiry's understanding and is without prejudice to and under reservation of any further submissions Multiplex may make or evidence it may lead in any forum.

2 Use of the Environmental Matrix

2.1 As a preliminary point, Multiplex notes the following paragraphs of PP6:

> *"4.2.5 The exact purpose and status of the Environmental Matrix shared with tenderers is still unclear. These matters were explored in greater detail at the hearing in April 2023 and the findings of the Inquiry will follow in due course.*
>
> *4.2.7 The Environmental Matrix was included in the Project Agreement as Reviewable Design Data (RDD). This meant the terms of the Environmental Matrix were not fully agreed between the parties when the Project Agreement was signed in February 2015, and that the document was subject to further review and approval by IHSL and the Board of NHSL."*

2.2 As is noted these are matters which were explored in the April 2023 hearings and in respect of which Multiplex has provided detailed submissions .

2.3 Multiplex's submissions explain, by reference to the contemporaneous documents, its understanding that (1) the purpose of the EM was to provide "*the room environmental condition requirements of the Board required within each department/unit/space/area"* and (2) at Financial Close, the whole EM was not subject to RDD. Only 7 points were identified at the meeting with NHSL on 11 November 2015 and were included in Section 5 of Schedule Part 6 of the Project Agreement. Multiplex therefore does not consider that paragraph 4.2.7 of PP6 is an accurate statement given the whole of the evidence available to the Inquiry on this point.

3 The aim of the commissioning process

3.1 Paragraph 1.1 of PP6 is concerned with how NHSL secured assurance and supporting evidence that (second bullet point):

> "*All key ventilation systems had been completed and functioned in accordance with contractual specifications and other applicable regulations, recommendations, guidance and good practice"*

3.2 Paragraph 2.1.3 of PP6 then states that:

> *"The Inquiry team understand from the quoted section of the BCRs that the mechanical ventilation requirements in the Room Data Sheets were not to be used as part of the commissioning process. Rather, Project Co were to demonstrate compliance with the 'functional requirements' of the rooms. At this stage it is not clear from the contract what the functional requirements were in relation to ventilation. It is also not clear where the functional requirements sit in relation to the terms of the contract quoted below. The Inquiry team invite CPs to assist on these points."*

3.3 Multiplex has addressed the use of the Room Data Sheets in the commissioning process in section 4 below of this response. As an overarching point, however, Multiplex considers that it is important that the Inquiry understand the purpose of the ventilation commissioning process. The purpose and aim of the commissioning process is to ensure that the specified and approved design is being achieved. See for example BSRIA Commissioning Air Systems (BG 49/2015) which defines commissioning as:

> ***Commissioning***
> The advancement of an installation from the state of static completion to full working order to specified requirements. For air systems, it includes the setting to work of an installation and the regulation of flow rates.

3.4 This accords with paragraphs 3.2.12 and 3.3.2 of PP6 which set out the Inquiry's understanding that the commissioning was to be done in accordance with the specified design.

3.5 Paragraph 3.2.12:

> *"Nonetheless, in that the BCRs provide for the commissioning phase to verify equipment performance against a contractual standard, they appear to be consistent with the purpose of ventilation commissioning set out in the Guidance"*

3.6 Paragraph 3.3.2:

> *"The Completion Criteria included the provision that all mechanical and electrical systems would be tested, commissioned and operate satisfactorily in accordance with the specified design criteria and in accordance with the specified design criteria and the Room Data Sheets. The position under the Guidance therefore appears to align with that set out in the contract."*

3.7 It also accords with paragraph 3.4.2 of PP6 which states that:

"The Inquiry team understand from CIBSE Commissioning Code A that an essential factor of ventilation commissioning is measuring air volume flow rates and comparing these with the flow rates required by the design."

4 The use of Room Data Sheets ("RDS") in the commissioning process

Production of final RDS

4.1 Paragraph 4.2.8 of PP6 states that:

"The development of the Environmental Matrix as RDD is addressed in a separate PPP by the Inquiry team. For the purposes of this PPP, it is understood that the Environmental Matrix was to be finalised before Room Data Sheets were submitted as RDD. As far as the Inquiry team are aware, no final Room Data Sheets were produced for the project, and the majority of the final environmental information agreed by NHSL and Project Co was contained in Version 11 of the Environmental Matrix, dated 25 October 2017."

4.2 As Multiplex set out in its November 2021 submission, the RDS were approved and agreed through the Review Process, for example the RDS in relation to critical care received Status B on 28 February 2018 (see Appendix 1).

Use of RDS

4.3 As noted above, Paragraph 2.1.3 of PP6 states that:

"The Inquiry team understand from the quoted section of the BCRs that the mechanical ventilation requirements in the Room Data Sheets were not to be used as part of the commissioning process. Rather, Project Co were to demonstrate compliance with the 'functional requirements' of the rooms. At this stage it is not clear from the contract what the functional requirements were in relation to ventilation. It is also not clear where the functional requirements sit in relation to the terms of the contract quoted below. The Inquiry team invite CPs to assist on these points."

4.4 Similarly, Paragraph 3.2.11 states that:

"As discussed at paragraph 2.1.3 of this PPP, the BCRs appears to provide that Room Data Sheets were not to be used as part of the commissioning process. At this stage it is not clear what the requirements were in relation to ventilation, how these were presented, or whether this would be seen to comply with the Guidance. The Inquiry team invite CPs to assist on these points."

4.5 Likewise, paragraph 2.1.15 of PP6 states that:

"As discussed above, the Completion Criteria included the provision that all mechanical and electrical systems would operate satisfactorily in accordance with the Room Data Sheets. It is not currently clear how that provision was to be read with paragraph 3.6.3 of the BCRs."

4.6 The RDS reflect the design which had been agreed and approved by NHSL (with the assistance of Mott MacDonald) through the Reviewable Design Data procedure ("RDD").

4.7 RDS are summary documents, with the detailed design being contained in the ventilation design drawings and grille schedules. Together these design documents show the detailed design for the ventilation and the air flow rates which allow the air change rates shown in the RDS to be achieved.

4.8 Taking critical care department B1 as an example:

4.8.1 The ventilation design drawing which covers this area is drawing WW-04-01-PL-524-001 titled Zone Z4 Level 01 Ventilation Distribution Sheet 1 of 2 (Appendix 2). This design was reviewed and approved at various stages through RDD by NHSL with Rev J being approved as status B by Brian Currie of NHSL on 03 May 2018.

4.8.2 This drawing details duct routes, duct ancillaries, duct sizes and contains the grille references.

4.8.3 The ventilation flow rates to be achieved at each grille shown on the ventilation design drawing are then further detailed on the associated grille schedules. Again, these were reviewed and approved by NHSL at various stages. For critical care these are:

(1) **WW-Z4-01-SH-524-001 titled Zone 4-1 Level 01 Schedule of Supply Grilles** (Appendix 3). Rev H was approved as status A by Brian Currie on 23/08/2018.

(2) **WW-Z4-01-SH-524-002 titled Zone 4-1 Level 01 Schedule of Extract Grilles** (Appendix 4). Rev I was approved as status A by Brian Currie on 23/08/2018.

(3) **WW-Z4-01-SH-524-003 titled Zone 4-1 Level 01 Schedule of Dirty Extract** (Appendix 5) Rev E was approved as status A by Jackie Sansbury on 02/05/2018..

4.9 These approved design flow rates which are then used to commission the systems.

4.10 The commissioning engineers prepare commissioning reports which compare the design air flow rate for each grille to the air flow rate actually being achieved, to ensure the actual air volumes are achieving the design. It is this comparison between design flow rate and actual flow rate which is witnessed and approved.

4.11 This comparison exercise can be seen by looking at the H&V commissioning reports, see below extract by way of example:

H&V Commissioning Services Ltd.
est: 1975

CONTRACT: ROYAL HOSPITAL FOR SICK CHILDREN & DCN - EDINBURGH

SYSTEM: AHU04-06 EXTRACT

GRILLE TEST SHEET

Design Data		Initial Test Data		Final Test & Regulation Data		
Terminal or Reference No.	Design Air Volume	Balometer Initial Air Volume	Balometer Final Air Volume	K Factor	Balometer Final Air Volume	% of Design
	l/s	l/s	l/s		l/s	
EG47	111.00	69.00	95.00	1.18	112.10	101
EG51	190.00	117.00	166.00	1.18	195.88	103
EG49	190.00	118.00	166.00	1.18	195.88	103
EG45	107.00	63.00	95.00	1.18	112.10	105
EG46	70.00	45.00	60.00	1.18	70.80	101
EG42A	130.00	69.00	115.00	1.18	135.70	104
EG42B	130.00	20.00	115.00	1.18	135.70	104
EG44	48.00	30.00	41.00	1.18	48.38	101
EG41	45.00	25.00	40.00	1.18	47.20	105
EG43	20.00	14.00	18.00	1.18	21.24	106
EG42C	88.00	74.00	75.00	1.18	88.50	101
EG39	50.00	27.00	45.00	1.18	53.10	106
EG38	78.00	39.00	70.00	1.18	82.60	106
EG40	49.00	35.00	42.00	1.18	49.56	101
EG37	10.00	13.00	9.00	1.18	10.62	106
EG31	90.00	69.00	80.00	1.18	94.40	105
EG33	65.00	51.00	55.00	1.18	64.90	100
EG32	24.00	17.00	21.00	1.18	24.78	103
EG35	50.00	34.00	45.00	1.18	53.10	106
EG29	78.00	36.00	66.00	1.18	77.88	100
EG28	79.00	40.00	67.00	1.18	79.06	100
EG27	60.00	27.00	55.00	1.18	64.90	108

Remarks:

Instrument Used: HV6/15 — Date: 24/10/2018

Engineer: Keiren Paton — Sheet 6 of 10

TEL: 01563 821991 FAX: 01563 822220 Web: www.handv.co.uk Email: talk2us@handv.co.uk
Kilknowe Office, 16 Barrmill Road, KA4 8HH / Glasgow Office (Suite 10) G20 8YA

4.12 The RDS themselves are not physically used on site during the commissioning process as they summarise the outcome, i.e., the air change rate to be achieved, rather than showing how that is achieved, i.e., the flow rate needed. In order to achieve that outcome, as explained above, the commissioning process uses the detailed ventilation design and grille schedules which have been agreed and approved and show the flow rates required at each grille.

4.13 In commissioning the systems to achieve these design air flow rates, and so the ultimate air change rates, the mechanical and electrical systems were shown to be operating in accordance with the Room Data Sheets and Environmental Matrix and so achieved the Completion Criteria stated at paragraph 2.1.4 and 2.1.32 of Schedule Part 10, Appendix B - Completion Criteria of the Project Agreement.

4.14 In light of the above, Multiplex does not agree with the position suggested at Paragraph 4.2.29 of PP6 that:

> *"Irrespective of the purpose of commissioning to verify equipment performance against design criteria, the Inquiry team therefore understand that the commissioning phase may have offered an opportunity for the parties involved in commissioning to have sight of design and performance criteria that was later identified by IOM as diverging from healthcare guidance."*

4.15 By commissioning stage, the design has been reviewed and approved by NHSL and their technical advisors through the RDD process. The aim of the commissioning process is then to compare actual air flow rates with the approved design air flow rates at each grille, to ensure that design is being achieved. It is not to re-consider the design.

5 Witnessing of the commissioning process

General

5.1 Paragraph 3.3.6 PP6 states that:

> *"The Inquiry team understand from the above that BYES were to witness the commissioning of all mechanical and electrical installations. The position under the Guidance therefore appears to align with that set out in the contract."*

5.2 Paragraph 3.4.8 PP6 suggests that:

> *"The IT contract provided that the IT would review 100% of all Mechanical and Electrical services test results. This is understood to include all the ventilation commissioning test results. The position under the Code therefore appears to align with that set out in the contract."*

5.3 Paragraph 4.2.31 PP6 suggests that:

> *"The Services Contract between IHSL and BYES intended that all mechanical and electrical installations would be fully witnessed by BYES. The IT contract also provided that the IT would undertake selective witnessing of the Mechanical and Electrical services testing and commissioning. It was anticipated this would apply to approximately 50% of the testing. These provisions complied with recommendations in CIBSE Commissioning Code A. However, in practice it does not appear that*

commissioning tests for AHU 04-06 were witnessed. Although the IT does not appear to have witnessed the testing for AHU 04-06, it is not known whether the IT otherwise complied with the witnessing provision in the IT contract. Commissioning tests for the IEFs were witnessed."

5.4 Multiplex is not able to comment on the IT or BYES' contractual requirements for witnessing; they can however assist in helping the Inquiry understand the witnessing process that was used in practice:

5.4.1 Commissioning programmes were produced, which showed commissioning activities and sequence for each of the M&E systems including proposed durations and dates.

5.4.2 2 week lookahead programmes were also prepared, setting out the exact dates when each system would be available for witnessing.

5.4.3 Diary invites were issued to all relevant parties (including NHSL, Mott MacDonald, the Independent Tester and BYES) to attend the witnessing.

5.4.4 All systems were made available to NHSL, Mott MacDonald, the Independent Tester and BYES for witnessing. It was, however, a matter for each of these parties whether or not they attended.

5.4.5 The commissioning process was also overseen and monitored through:

5.4.5.1 Group Witnessing Meetings attended by Mott MacDonald, Multiplex, BYES, NHSL and IHSL

5.4.5.2 Board / Group Commissioning Meetings attended by NHLS, Multiplex, BYE, Mott MacDonald and Arcadis

5.4.5.3 Combined Group Commissioning Meetings attended by Mott MacDonald, Multiplex, BYES, NHSL, IHSL and Arcadis

5.4.5.4 Sub Contractor Commissioning Meetings; and

5.4.5.5 Commissioning Trackers.

6 IEFs

6.1 Paragraph 4.2.27 of PP6 states that:

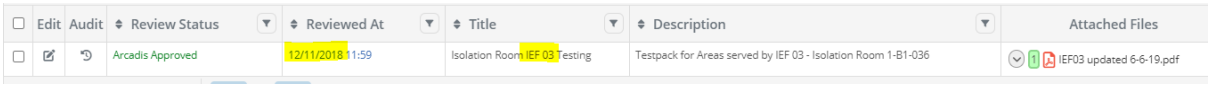
"The Inquiry team cannot locate commissioning test report approval for any of the IEFs other than for IEF06, which was approved by Arcadis on 9 November 2018. On the basis that these reports were not approved, it is not known why the IT did not request the outstanding information for approval or why the Certificate of Practical Completion was issued without this information being approved."

6.2 Further at paragraph 7.2 of PP6 the Inquiry ask if parties are able to provide:

"“IT approval of commissioning tests for IEF03 – IEF05”

6.3 This information is available on Zutec, relevant extracts are copied below:

IEF 03

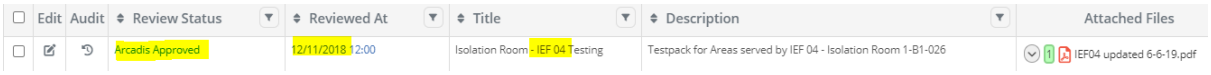


Edit	Audit	Review Status	Reviewed At	Title	Description	Attached Files
		Arcadis Approved	12/11/2018 11:59	Isolation Room IEF 03 Testing	Testpack for Areas served by IEF 03 - Isolation Room 1-B1-036	IEF03 updated 6-6-19.pdf

Review Status History

Reviewed By	Review Status	Comments	Date & Time	Review Files
Christian Darbyshire	Arcadis Approved	REVIEWED ONLY by Arcadis	12/11/2018 11:59	
David Wilson	MPX Approved	Updated certificates to be added on confirmation of isolation room volumes	29/10/2018 14:41	
Adam Shanks	Offered For Review - Contractor		28/10/2018 18:21	

IEF 04

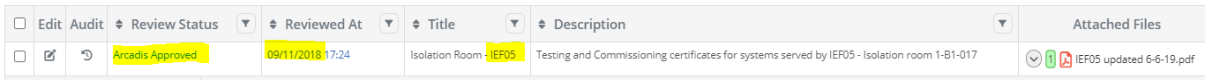


Edit	Audit	Review Status	Reviewed At	Title	Description	Attached Files
		Arcadis Approved	12/11/2018 12:00	Isolation Room - IEF 04 Testing	Testpack for Areas served by IEF 04 - Isolation Room 1-B1-026	IEF04 updated 6-6-19.pdf

Review Status History

Reviewed By	Review Status	Comments	Date & Time
Christian Darbyshire	Arcadis Approved	REVIEWED ONLY by Arcadis	12/11/2018 12:00
David Wilson	MPX Approved	Updated certificates to be added on confirmation of isolation room volumes	29/10/2018 14:41
Adam Shanks	Offered For Review - Contractor		28/10/2018 18:21

IEF 05



Edit	Audit	Review Status	Reviewed At	Title	Description	Attached Files
		Arcadis Approved	09/11/2018 17:24	Isolation Room - IEF05	Testing and Commissioning certificates for systems served by IEF05 - Isolation room 1-B1-017	IEF05 updated 6-6-19.pdf

Review Status History

Reviewed By	Review Status	Comments	Date & Time	Review Files
Christian Darbyshire	Arcadis Approved	REVIEWED ONLY by Arcadis	09/11/2018 17:24	
David Wilson	MPX Approved		30/10/2018 20:25	
Adam Shanks	Offered For Review - Contractor		30/10/2018 19:58	

6.4 As is explained in Section 7 below, further commissioning and witnessing of the isolation rooms was then undertaken in accordance with the Settlement Agreement post completion, prior to the planned migration.

7 Pressure differential data

7.1 Paragraph 4.2.22 of PP6 states that:

> *"Although ventilation supply and extract data for the AHU and IEFs was measured and recorded, it does not appear the same was done for room pressure differential data. As far as the Inquiry team understand, room pressure differentials were only recorded by H&V for the AHUs that served operating theatres. It appears that no room pressure differentials were recorded, witnessed or approved for the rooms in Table 1. This was despite the design for these areas having pressure requirements relative*

to adjacent spaces. In practice it therefore appears that the provisions set out in the above paragraph were not achieved, however, the Inquiry team invite CPs to assist on this point."

7.2 Under the Settlement Agreement dated 22 February 2019, it was agreed that further works would be undertaken to the heater batteries in the isolation room lobbies and radiant panels in the isolation rooms in critical care, as part of the Post Completion Works.

7.3 The works to be carried out are detailed in Schedule Part 5 of the Settlement Agreement. Part of the Scope of Works included that:

"Project Co shall undertake all necessary system commissioning and the revalidation/verification and pressure testing of the isolation room following completion of all works. Project Co shall undertake a Handover Clean after all work is complete".

7.4 Schedule Part 5 also records the agreement that part of the completion criteria for these works would be that:

"Pressure testing of all relevant isolation room suites is completed satisfactorily"

7.5 The final commissioning of the pressure differentials was therefore carried out as part of these Post Completion Works, prior to the planned migration.

7.6 This activity was completed on the 06/06/2019, as is confirmed by the Completion Certificate issued by Arcadis on this date (Appendix 6).

7.7 At Paragraph 7.2 of PP6 the Inquiry ask if parties are able to provide:

"Room pressure differential test data, and IT approval of this, for AHU 04-06 and IEF03 – IEF06"

7.8 Validation reports dated 06/06/2019 detail the room pressure differentials for isolation rooms 1-B1-016, 1-B1-017, 1-B1-026 and 1-B1-036. These rooms are served by AHU 04-06 supply and IEF 03-06. These were witnessed and signed by Multiplex, Mercury and Arcadis. The reports were approved on Zutec by Arcadis on 17 June 2019 and are produced as Appendix 7.

8 Training

8.1 Paragraph 4.2.32 of PP6 states that:

"Paragraph 8.15 of the BCRs stated: "Project Co shall provide such staff training as is deemed necessary by the Board details of training proposed shall be submitted to the Board as Reviewable Design Data". This provision facilitated the recommendation in SCIM commissioning guidance that staff training and familiarisation should be organised prior to handover.

The Inquiry team have not been able to locate the 'details of training proposed' that this paragraph of the BCRs provided to be submitted as RDD. However, the Inquiry team have had sight of a letter dated 1 April 2019 from the Board of NHSL to Gordon James of Health Facilities Scotland (HFS)."

8.2 Training plans and requirements were developed in conjunction with NHSL.

8.3 Two training matrices were developed:

8.3.1 FM Staff; and

8.3.2 Super Users.

8.4 FM Staff refers to the training provided to BYES. The term "Super Users" was a term used by NHSL to describe their lead staff who would attend the training and familiarisation sessions.

8.5 Final versions of the agreed matrices are produced as Appendix 8.

8.6 The development of these training matrices can be seen from the minutes of the Group Commissioning Meetings. For example:

8.6.1 Group Witnessing Workshop/RHSC & DCN Commissioning Group – No.1 dated 26 July 2017 Appendix 9.

8.0 Training Programme

8.1 BYES, NHS project team, Super Users

IH to check with CG as there is a training programme available. JS confirmed that she was arranging a meeting for early next week to discuss and finalize with CG

8.6.2 Group Witnessing Workshop/RHSC & DCN Commissioning Group – No.16 dated 27 June 2018 Appendix 10.

7.0 Training Programme

7.1 DW noted that the building systems revised training schedule had been issued and return comments to be issued by 01/06/18. Comments now received (via Callum Gordon 13/06/18) and amendments made. No comments from BYES.

7.2 DW confirmed that the user training schedule had been updated and issued and a further meeting with Callum Gordon (13/06/18) to discuss the department / user training. Action for DW to update the schedule after further comments issued. – w/c 02/07/18

8.6.3 Group Witnessing Workshop/RHSC & DCN Commissioning Group – No.23 dated 20 November 2018 Appendix 11.

7.0 Training Programme

7.1 FM training commenced Monday 24/09 and is nearing completion.- DW to rearrange two sessions for BYES – Above Ground Drainage, LV Electrical. - Complete

7.2 Super user training now commenced and due to complete Friday 26th October. – Complete, DW agreed to carry out a further two session on December.

8.7 The final matrices set out the training to be provided in relation to each system.

8.8 Attendance at the training sessions was recorded using sign off sheets.

8.9 For each session, presentation packs were produced and provided. See for example the Ventilation Training Presentation provided to BYES produced as Appendix 12.

8.10 These presentations and training packs were developed in conjunction with NHSL. As an example, see the correspondence produced as Appendix 13, where NHSL provided draft amendments and comments on the presentation pack to be used at the Super Users session A & B.

8.11 The Combined Group Commissioning meeting minutes from no. 23 onwards confirm that all training is completed (see Appendix 14).

9 Settlement Agreement

9.1 Paragraph 4.2.10 of PP6 states that:

> *"In late 2017 and early 2018, the Board of NHSL also identified further aspects of the ventilation design that were potentially non-compliant with SHTM 03-01. The resolution to these matters and the four-bed ventilation dispute was eventually agreed between the parties in the Settlement Agreement dated 22 February 2019. It does not appear that an updated version of the Environmental Matrix was produced to incorporate these resolutions".*

9.2 Paragraph 4.2.16 states that:

> *"The Critical Care bedrooms were all served by AHU 04-06. That AHU was commissioned on 24 and 30 October 2018. The separate IEFs were commissioned between February and July 2018. However, it appears the Settlement Agreement of 22 February 2019 finalised the specification for these rooms and required an alteration to the design of the four-bed rooms. It is therefore not clear to the Inquiry team how the earlier commissioning sits in relation to the later agreed specification. The Inquiry team invite CPs to assist on this point."*

9.3 As Multiplex has set out previously, for example in their November 2021 submission and their response to Provisional Paper 4, Multiplex considers the Settlement Agreement and Supplemental Agreements between NHSL and IHSL and IHSL and MPX dated 22 February 2019 ("the SA") are an important part of the factual matrix.

9.4 This is because the SA confirmed NHSL's technical requirements for the hospital. Where those requirements were different from SHTM 03-01, it also confirmed that the design and construction should meet the NHSL's bespoke requirements, as documented in the SA.

9.5 In relation to the particular points raised in PP6, Multiplex considers that the Inquiry's position at paragraph 4.2.16 is factually inaccurate. The Settlement Agreement did not require an *"alteration to the design of the four-bed rooms".* The SA confirmed that what had been designed and constructed was acceptable to NHSL. No change was required to the four-bed room design as a result of the SA.

9.6 By way of background, the SA was subject to detailed and lengthy negotiation between the parties, with all parties being legally represented and (as Multiplex understands it) Mott Macdonald providing technical advice to NHSL in relation to the matters covered by the SA.

9.7 Under the SA, NHSL agreed to resolve certain heads of claim (known as the "Released Claims").

9.8 These Released Claims included any claims arising out of or connected with: (1) the Dispute; (2) the underlying facts of the Dispute; (3) any act, omission, breach, default, negligence or failure to comply with the Construction Contract in relation to the Dispute; and (4) the Agreed Resolution.

9.9 The "Dispute" is defined in the SA as: (i) all claims, disagreements and disputes arising out of or in connection with the matters which are set out in the column entitled "Dispute" in the Technical Schedule; and/or the Post Completion Disputed Works.

9.10 The Agreed Resolution is the technical solution agreed as resolving the Dispute as described in the Technical Schedule.

9.11 A number of the items contained within the Technical Schedule relate to ventilation. Multiplex has previously provided a copy of the Technical Schedule and the supporting documentation in relation to the ventilation items to the Inquiry but for ease, has produced them again as Appendix 15 to this response. There are 79 items in the Technical Schedule, of which 7 relate to ventilation.

9.12 As part of its response to the Public Inquiry's Ventilation Spreadsheet and associated questions in November 2021, Multiplex provided a detailed review of the position in relation to the critical care four bed wards. Multiplex's response and the associated documents are produced again as Appendix 16 to this response.

9.13 As is set out in Multiplex's response, the detailed design for the Multi-Bed Wards was approved through RDD under the Project Agreement. Following this review process, NHSL then changed their requirements in relation to the pressure regime in the Multi-Bed Wards, requiring balanced or negative to the corridor, as opposed to positive pressure.

9.14 NHSL, however, maintained their requirement for 4AC, this being expressly confirmed by email on 18 April 2018 where NHSL stated*: "we are seeking design for 4 Air Changes to all 14 rooms"*[1]*.*

9.15 Multiplex worked with NHSL and their technical advisors to change the pressure from positive to balanced or negative pressure, the relevant design document being the *"General Ward – Ventilation Amendment Proposal".* This was reviewed through RDD and approved as Status A by NHSL on 27 July 2018[2].

9.16 In relation to the four bed wards in critical care, the approve design stated is as follows:

- "B1-009: *" Retain the supply ventilation at 4ac/hr. Introduce new general extract ductwork and grille into the room to provide 4ac/hr overall. The existing general extract ductwork currently serving the room has been increased in size and another grille added to it to serve the room. This will achieve a balanced room pressure. New branch duct to be connected locally into the existing general extract ductwork main. The main itself will be increased in size over a defined length. Supply & Extract Duty 348l/s. (Equates to 34 people)."*

- B1-031: *Retain the supply ventilation at 4ac/hr. Introduce new general extract ductwork and grille into the room to provide 4ac/hr overall. The existing general extract ductwork currently serving the room has been increased in size and another grille added to it to serve the room. This will achieve a balanced*

[1] See document 2.7.9 previously produced by Multiplex as part of their November response, included as Appendix 16.
[2] See document 2.7.11 previously produced by Multiplex as part of their November response, included as Appendix 16

room pressure. New branch duct to be connected locally into the existing general extract ductwork main. Supply & Extract Duty 332l/s. (Equates to 33 people).

- B1-063: *Retain the supply ventilation at 4ac/hr. Introduce new general extract ductwork and grille into the room to provide 4ac/hr overall. The existing general extract ductwork currently serving the room has been increased in size and another grille added to it to serve the room. This will achieve a balanced room pressure. New branch duct to be connected locally into the existing general extract ductwork main. Supply & Extract Duty 312l/s. (Equates to 31 people)."*

9.17 On 05 July 2018, Multiplex then issued an updated extract of the Environmental Matrix to NHSL reflecting their updated requirement for positive pressure in relation to the 4 bed wards[3].

9.18 The associated underlying design drawings were then re-submitted though the RDD procedure as follows:

- Drawing WW-Z4-01-PL-524-001 Rev J, was reviewed and approved as Status B on 03 May 2018 (see Document 2.7.14, included as part of Appendix 16).

- Schedule WW-Z4-01-SH-524-003 Rev E Dirty Extract Grilles was approved Status A on 2 May 2018 (see Document 2.7.15, includes as part of Appendix 16).

- Schedule WW-Z4-01-SH-524-001 Rev G and H Supply Grilles were approved Status B on 22 May 2018 and Status A on 23 August 2018 respectfully (see Document 2.7.16, included as part of Appendix 16).

9.19 The RDS for the rooms were likewise updated to reflect the balanced pressure now required (see Document 2.7.17, included as part of Appendix 16).

9.20 The four bed wards were then commissioned, witnessed, and approved to meet these requirements. As was set out in Multiplex's November 2021 response, AHU 04-06 Supply was commissioned on 30 October 2018. AHU 04-06 Extract was commissioned on 24 October 2018. This was approved by the independent tester on 18 February 2019 (see Document 2.7.18, included as part of Appendix 16).

[3] See document 2.7.12 and 2.7.13 previously produced by Multiplex as part of their November response, included as Appendix 16.

9.21 Item 7 in the Technical Schedule to the SA did not change this design, instead it confirmed NHSL's requirements for all multi-bed wards by reference to the design documents discussed above, copies of which were produced as part of the SA[4]:

Item	Dispute	Description of Agreed Resolution
7	**4 bed ventilation** In relation to ventilation pressure regimes, the Board believes Project Co's design for the 4 bed ventilation is non-compliant with the Board's Construction Requirements ("BCRs"), Project Co Proposal's ("PCPs"), SHTM Guidance, and also non-compliant with comments made by the Board on the Environmental Matrix in the Reviewable Design Data schedule at Financial Close. The Board also notes the Environmental Matrix was altered during Preferred Bidder to Financial Close period and was therefore not a direct copy of the reference design environmental matrix. In addition, the Board believe the intake air change rate and the extract air change rate are non-compliant. From a clinical perspective, the principal concern to the Board in continuing with Project Co's proposed pressure regime design means there is an unacceptable risk of the spread of bacterial airborne infections into corridors and surrounding patient rooms (positive to the corridor) The Board requires the pressure regime to be balanced or negative to the corridor. Project Co's position is that the design and installation meets the requirements of the Project Agreement, was based on the package approved through Schedule Part 8 (Review Procedure) which included the environmental matrix which had been discussed and was agreed pre Financial Close. The environmental matrix was a direct copy of the reference design environmental matrix developed during the preferred bidder period. No adverse comments were received prior to or at Financial Close. Each party disagrees with the other party's position and therefore a dispute has arisen.	The Reviewable Design Data noted below for this item has been given status Level B in accordance Schedule Part 8 (Review Procedure). The resolution of the Dispute submitted by Project Co through the Schedule Part 8 (Review Procedure) and agreed by the Board, is for 14 No 4 bed rooms to be balanced or negative to the corridor at 4 ac/hr. The remaining 6No 4 bed wards remain as per the environmental matrix, WW-XX-XX-DC-XXX-001 Rev 11, and rev 07 of the schedule WW-SZ-XX-DC-XXX-010. All as noted within Aconex MM-GC-003999, & MPX-TRANSMIT-010869 as set out in Disputed Works Schedule Appendix 1 Item 7. All as noted on drawings:- WW-Z3-03-PL-524-001 Rev G Zone Z3 Level 03 Ventilation Distribution Sheet 1 of 2 RDD Status B (3/5/18) WW-Z4-00-PL-524-001 Rev K Zone Z4 Level 00 Ventilation Distribution Sheet 1 of 2 RDD Status B (3/5/18) WW-Z4-00-PL-524-002 Rev L Zone Z4 Level 00 Ventilation Distribution Sheet 2 of 2 RDD Status B (3/5/18) WW-Z4-01-PL-524-001 Rev J Zone Z4 Level 01 Ventilation Distribution Sheet 1 of 2 RDD Status B (3/5/18) WW-Z4-03-PL-524-001 Rev G Zone Z4 Level 03 Ventilation Distribution Sheet 1 of 2 RDD Status B (3/5/18) WW-Z4-03-PL-524-002 Rev G Zone Z4 Level 03 Ventilation Distribution Sheet 2 of 2 RDD Status B (3/5/18) WW-SZ-XX-DC-XXX-010 Rev 07 General Ward - Ventilation Amendments Proposal RDD Status B (31/5/18).

9.22 Whilst not currently referred to by the Inquiry in PP6, Multiplex considers that Item 13 of the SA is also relevant to the Inquiry's Terms of Reference in relation to the single bedroom design. Multiplex provided a detailed review of this as item 2.11 of their November 2021 response. That is produced as Appendix 18 again for ease.

9.23 As is set out in that response, NHSL expressly confirmed in the SA their requirement for 4AC in single bedrooms.

9.24 Appendix 1 to Item 13 (see Document 2.11.6 produced as part of Appendix 18) records the "Details of Change" as:

> *"Table A1 of Appendix 1 : Recommended air-change rates of SHTM 03-01: Part A - Design and Validation indicates that single room should be provided with 6 ac/h and 0 or -ve pressure. Single room WC should be provided with 3 ac/h and -ve pressure.*
>
> *Project Co proposes to:*
>
> *1. Decrease the mechanical air change ventilation rate within single bedrooms from 6 air changes per hour (6 ac/hr) to 4 air changes per hour (4 ac/hr); and*
>
> *2. Increase the mechanical air change ventilation rate within single bedroom WCs from 3 air changes per hour (3 ac/hr) to minimum 10 air changes per hour (10 ac/hr)."*

10 Appendix 1 to Item 13 records the "Reasons" as:

> *"Project Co's design philosophy for bedroom ventilation is based on mixed mode operation where*

[4] See Appendix 17

mechanical supply ventilation providing 4ACH is then supplemented by openable windows to provide a passive means of ventilation (where access to an openable window is available)"

10.1 The SA therefore confirmed the requirement for 4 mechanical AC/hr within single bedrooms and again, no further works or commissioning were needed as a result of the SA.

11 Validation and IOM involvement

11.1 Paragraph 5.35 of PP6 states that:

"The 24 IOM reports investigated 37 areas of the hospital, ranging from UCV theatres to single and four-bed bays in the High Dependency Unit (HDU), isolation suites, recovery rooms and rooms within the neonatal unit. If the 24 IOM reports form the entirety of reports predating 4 July 2019, it is not clear to the Inquiry team why these 37 areas were selected for assessment. The Inquiry team invite CPs to assist on this point."

11.2 Paragraph 5.36 states that:

"Among other things, IOM tested these 37 areas with respect to air change rates and pressure differentials. Of the 37 areas known to the Inquiry team to have the 37 areas known to the Inquiry team to have been surveyed, 23 failed to achieve the air change rate and/or pressure differential standards recommended by SHTM 03-01. Of the 23 areas that failed, seven were in Critical Care."

11.3 Multiplex had no involvement in the appointment of IOM.

11.4 As part of their November 2021 response Multiplex addressed the questions posed by the Inquiry regarding "IOM Reports" as part of their response to item 1.10. A copy is included again as Appendix 19 to this response.

11.5 As Multiplex explained, on 03 June 2019, three months after Multiplex had handed over the ventilation system, but only one month prior to the planned opening of the hospital, NHSL advised that they would be carrying out an independent validation of all critical ventilation systems beginning on 17 June 2019 for approximately 8-10 days[5].

11.6 Multiplex was not in control of the ventilation system at this point, given completion had been certified and the hospital handed over.

11.7 On 25 June 2019 (2 weeks before the planned opening of the hospital) NHSL forwarded IOM's "*first issue log*".[6] These results related just to the critical ventilation systems. The log was a one page document which did not provide Multiplex with any of the underlying test results, or any details to explain and support the items raised.

11.8 The IOM Report stated the following in relation to "HDU's":

HDU's	Only achieving 3-4 ach/hr vs required 10	NHS have apparently agreed this??

[5] See document 1.10.5 previously produced by Multiplex as part of their November response, included as Appendix 19
[6] See document 1.10.6 previously produced by Multiplex as part of their November response, included as Appendix 19

11.9 This corroborates and confirms the position Multiplex has explained previously, that 4AC was what NHSL had asked to be provided in Critical Care.

11.10 On 9 July 2019 (the day of the planned migration), NHSL issued: "*IOM 1st Issues Log 250619 updated by NHSL 080719*.[7] This updated log shows the majority of the items raised by IOM as having been addressed.

11.11 As is set out in Document 1.10, thereafter IOM issued test results in relation to a wider review exercise undertaken by them of the general ventilation system. Again, Multiplex was not involved in the instruction or invited to attend this further testing by IOM. Instead, Multiplex was provided with test results which were incomplete and inaccurate with no detail of the methodology or approach which had been adopted by IOM.

11.12 It became apparent that there were a number of difficulties caused by the approach taken by IOM. These difficulties included:

11.12.1 IOM did not appear to be fully or properly briefed on NHSL's Construction Requirements.

11.12.2 IOM carried out their review and issued their results without reference to the original commissioning strategy and ventilation systems, the result being that there are no system references on the reports generated by them.

11.12.3 IOM's results were inaccurate due to the testing methodology and instruments used.

11.12.4 IOM carried out the review without considering a correction factor as required by CIBSE Commissioning Code A and BSRIA guidance. After this was highlighted to NHSL, IOM updated their results to include the required factor.

11.13 Notwithstanding this Multiplex worked with IOM and NHSL to try and understand IOM's results, review them and to confirm that the systems were all performing as per their design. As is explained in Document 1.10 minimal adjustments were made to the general design flow rates as a result of the IOM validation.

12 Conclusions

12.1 Multiplex would ask that the Inquiry take account of the position set out in this response and update PP6 accordingly.

12.2 Multiplex is happy to discuss this response with the Inquiry team if it would be of assistance.

[7] See document 1.10.7 previously produced by Multiplex as part of their November response, included as Appendix 19

25 August 2023

By e-mail only – [redacted]

For the attention of Inquiry Team
Scottish Hospitals Inquiry

Our Ref: TUVS/2/3
Your Ref: TBC
Direct e-mail: [redacted]

Dear Sir or Madam

TUV SUD Limited/Wallace Whittle Limited (TSWW)
RHCYP/DCN Edinburgh
Response to Provisional Position Paper 6 – Commissioning and Validation Processes

TSWW welcomes the opportunity to comment on Provisional Position Paper 6, first circulated on 1 August but officially published on 4 August.

We note that Core Participants are directed to confine their comments to only those matters requiring material clarification or correction, particularly on matters of fact.

We, in turn, would wish the Inquiry to note by way of general clarification that, rather than appearing to touch on design issues (which are main focus for TSWW), the issues raised in the working paper relate primarily to Multiplex (MPS) and their Commissioning Team – for their roles in the commissioning and validation processes - and to NHSL and its advisers – for their roles in securing assurance and supporting evidence that those processes had been undertaken to a satisfactory standard.

TSWW's involvement in the commissioning and validation processes was managed by MPX's Commissioning Team and, as such, was on a "by exception" basis: limited to where they, as designers, were asked to assist by reviewing performance results against the design, for example, if an issue arose whereby the Commissioning Team were struggling to achieve the specified design performance criteria.

TSWW played no part, at the time, in identifying and establishing the relevant contractual provisions governing commissioning and validation and what was needed to demonstrate compliance with the MEP requirements for the RHCYP/DCN. They are not therefore in a position to comment and assist the Inquiry on those aspects of matters.

With that direction and general clarification in mind, please find below our response, on behalf of TSWW, following the order and paragraph numbering of the working paper.

3.2.8 TSWW would endorse the Inquiry's view that the essential purpose of ventilation commissioning is to verify that the equipment in question is capable of delivering the performance criteria required by the design and that it is not ordinarily or primarily concerned with verifying performance criteria against healthcare guidance (albeit that the design is informed by healthcare guidance).

3.2.11 In terms of standard industry practice, and in accordance with the CIBSE Commissioning Code A procedure noted in para 3.4.2 , ventilation systems are ordinarily commissioned against the airflow rates and other such criteria provided by the designer. These criteria are the outcome of the designers' calculations; for example, of the airflow rates from each grille required to provide the air change rates

needed to comply with the relevant healthcare guidance, such as SHTM 03-01. Similarly, pressure requirements for areas or rooms are again normally as per SHTM 03-01. The relevant commissioning data (i.e. airflow rates and pressure values etc.) is normally provided in the form of plant or equipment schedules, as was the case at RHCYP/DCN.

4.2.10 TSWW were not a party to, or at the time aware of, the Settlement Agreement entered into on 22 February 2019 whereby various matters of dispute were apparently resolved. They would not therefore have been in a position to – and were not in any case asked to - produce an updated version of the Environmental Matrix (or Room Data Sheets) incorporating those resolutions.

7.2 - 13 Given its very limited involvement in the commissioning and validation processes, TSWW is unable to assist the Inquiry in relation to the queries raised or the provision of the documents sought.

We trust that the foregoing is of assistance but should the Inquiry have any queries, or require any further information or clarification, then we/TSWW would of course be willing to provide it.

Yours faithfully

[redacted]

Alan Eadie
Partner
For and on behalf of BTO Solicitors LLP

Public Inquiry: Queen Elizabeth University Hospital, Glasgow and the Royal Hospital For Children and Young People and Department of Clinical Neurosciences, Edinburgh ("The Inquiry" Or "SHI")

Response on behalf of IHS Lothian Limited to the Inquiry's Provisional Position Paper 6 relating to the Royal Hospital for Children and Young People and Department of Clinical Neurosciences ("RHCYP/DCN" or "Project")

1. INTRODUCTION

1.1 This document forms the response ("**Response**") on behalf of IHS Lothian Limited ("**IHSL**") to the Inquiry's document entitled *'Provisional Position Paper 6: The commissioning and validation process utilised for the Royal Hospital for Children and Young People and Department for Clinical Neurosciences*' ("**PPP6**").

1.2 The Inquiry Team has advised Core Participants ("**CPs**") that PPP6 outlines the Inquiry Team's current understanding of the process utilised to commission and validate the ventilation systems for the Royal Hospital for Children and Young People and the Department for Clinical Neurosciences (RHCYP/DCN).

1.3 IHSL notes the Inquiry Team's comment (at paragraph 3 of PPP6) that the Chair is likely to be invited by the Inquiry Team to make findings in fact based on PPP6 and that CPs may seek to "*correct and/or contradict it by way of response to this paper*". Accordingly, IHSL notes 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*".

1.4 IHSL's legal team have discussed it's concerns with PPP6 with the Inquiry Team and identified an appropriate approach to responding to PPP6. In this Response, therefore, IHSL provides headline comments on PPP6 which sets out its key concerns. In order to assist the Inquiry, IHSL considers that it would be helpful to provide more detailed comments on the matters addressed below to the Inquiry Team to be submitted in due course. IHSL will liaise with the Inquiry Team in that regard.

1.5 As invited by the Inquiry, IHSL's comments are limited to the factual matters where IHSL might seek to "*correct and/or contradict*" the contents of PPP6.

1.6 IHSL is a special purpose vehicle which was incorporated solely for the purpose of providing a vehicle for non-recourse project finance and delivering the Project. IHSL was not directly involved in undertaking the commissioning of the ventilation systems and is unable to address many of the factual issues highlighted by PPP6; other Core Participants and relevant parties will be better placed to address those issues.

1.7 The comments in this Response are intended to assist the Inquiry Team to understand the relevant facts during the commissioning and validation process in line with the Inquiry Team's purpose in

drafting PPP6. IHSL appreciates that PPP6 is provisional in nature. Nevertheless, IHSL considers that further detailed inquiries and consideration will be required by the Inquiry Team into the matters addressed in PPP6 before any conclusions on those matters are capable of being drawn.

2. CONTRACTUAL PROVISIONS FOR VENTILATION COMMISSIONING

2.1 Section 2 of PPP6 seeks to identify the relevant contractual provisions for ventilation commissioning. However, in doing so Section 2 only appears to reference paragraph 3.6.3 and paragraph 8 of Section 3 of Schedule Part 6 (Board's Construction Requirements) to the Project Agreement with regards to commissioning.

2.2 The Project Agreement adopted the 'Standard Form Project Agreement' for use on a project adopting the NPD model which was issued by Scottish Futures Trust ("**SFT**"). It should be kept in mind that the starting point for the Project Agreement was not the parties own set of terms but SFT's standard form (appropriate for use with the NPD model).

2.3 It appears to IHSL that the reference to paragraph 3.6.3 of Section 3 of Schedule Part 6 (Board's Construction Requirements) is an unusual and potentially unhelpful starting point when identifying the provisions of the Project Agreement which are relevant to commissioning. The Project Agreement (and, in turn, the Construction Contract) contain detailed and comprehensive provisions regarding the construction and commissioning process which PPP6 does not appear to refer to. For example:

2.3.1 the Project Agreement contained an "Outline Commissioning Programme" at Schedule Part 10 and also set out "Commissioning Responsibilities" in Table A of Appendix A;

2.3.2 Clause 17 of the Project Agreement contains detailed provisions regarding the Pre-Completion Commissioning to be undertaken by Project Co under the Project Agreement (and, in turn, MPX under the Construction Contract) which involved the Board and Project (under the Project Agreement) and Project Co and MPX (under the Construction Contract) agreeing a Final Commissioning Programme (which was a developed from the Outline Commissioning Programme);

2.3.3 Clause 17 of the Project Agreement also recognised that the Board itself carried out its own commissioning of certain elements prior to completion of the Project (referred to as the "Board's Commissioning"). The Project Agreement always envisaged that the Board would be on-site undertaking its own commissioning of certain elements prior to Completion;

2.3.4 Clause 17.8 of the Project Agreement obliged Project Co to give written notice to the Independent Tester and the Board of the commencement of Project Co's Pre-Completion Commissioning and invited the Independent Tester and the Board's Representative to witness all of Project Co's Pre-Completion Commissioning;

2.3.5 Clause 18 of the Project Agreement addressed the Post-Completion Commissioning. The Project Agreement always envisaged that there would be a degree of commissioning undertaken post Completion of the Project; and

2.3.6 Schedule 6 Part 4 (Project Co's Proposals) 'Item 16 (Commissioning)' which set out Project Co's Proposals with regards to commissioning. Notably, Item 16 of Project Co's Proposals defines commissioning as "*the advancement of an installation from the stage of static completion to working to specified requirements."*

2.4 It is not clear to IHSL why PPP6 places particular focus upon paragraph 3.6.3 of the BCRs when identifying relevant contractual provisions concerning commissioning or uses that as the starting point.

2.5 The Inquiry Team has invited comments from the Core Participants on paragraph 3.6.3 of the Board's Construction Requirements. Paragraph 3.6.3 of the BCRs is entitled "Room Data Sheets"; it does not appear to be primarily concerned with commissioning. It states that Project Co shall provide Facilities that, as a minimum, meet all the requirements specified in the Room Data Sheets included in Section 6 of Schedule Part 6 of the Project Agreement. It also states that as part of the commissioning process, Project Co shall be responsible for demonstrating compliance with the requirements included in the Room Data Sheets. The conclusion drawn by the Inquiry Team at paragraph 2.1.3 of PPP6 appears to be at odds with that statement.

2.6 Paragraph 3.6.3 then states that "*for the avoidance of doubt, Project Co shall provide mechanical ventilation …. to suit the functional requirements of each of the rooms in the Facilities."* As the Inquiry notes, there is no real definition of "functional requirements" and the provision appears vague. The functional requirements would be expected to be defined by the Board in conjunction with the clinical user groups etc. (see, for example, the written witness statement of Susan Grant in relation to the hearings in April/May 2023). Where those functional requirements are expressed by the Board it is IHSL's understanding those would be set out in the Board's requirements as expressed in the Environmental Matrix and subsequently in Settlement and Supplemental Agreement 1.

2.7 IHSL also notes that PPP6 does not address any of the provisions of the Construction Contract. As has been explained elsewhere in earlier written submissions, IHSL is a special purpose vehicle which was incorporated solely for the purpose of providing a vehicle for non-recourse project finance and delivering the Project. Consequently, Project Co requires to procure the design and construction of the Project and the delivery of the Services throughout the relevant Service Period through entering into two key sub-contracts in order to raise long term debt for the Project: the Construction Contract and the Services Contract. Project Co is not a corporate entity capable of delivering those functions itself.

2.8 IHSL, therefore, entered into the Construction Contract with Brookfield Multiplex Construction Europe Limited ("**MPX**") in order to sub-contract its design and build obligations in the Project Agreement. The Construction Contract was procured on what is best described as a "back-to-back" basis with the terms of the Project Agreement i.e. on a directly flowed down basis. The "Works" under the Construction Contract include the design, construction, testing and commissioning of the Facilities. In addition, IHSL entered into the Services Contract with Bouygues E&S FM UK Limited ("**BYES**") for the provision of the Services.

2.9 Section 2 of PPP6 does not appear to acknowledge the pass down of Project Co's obligations to the Construction Contract or make any reference to the Construction Contract.

The Operation and Maintenance Manual

2.10 Paragraphs 2.1.4, 2.1.5 and 2.1.6 of PPP6 refer to clause 18 of the Project Agreement and the production of hard copy and electronic copies of the Operation and Maintenance Manual.

2.11 It is worth noting that on 30 November 2018, NHSL issued a Board Change Notice 118A ("**BCN 118A**") which removed the existing requirement under the Project Agreement for Project Co to provide 3 hard copies of the O&M manuals. Instead, NHSL required the following:

(a) two electronic copies of the Final Draft of the O&M manual; and

(b) three electronic copies of the Principal O&M manual.

2.12 An equivalent instruction was issued by Project Co to MPX under the Construction Contract and to BYES under the Services Contract.

2.13 The electronic copies were submitted to NHSL through an electronic platform called 'Zutech'. IHSL understands that the Final Draft of the O&M was uploaded onto Zutech and was made available to all parties on 22 February 2019.

2.14 IHSL further understands that the Principal O&M manuals were made available to parties on 26 June 2019.

2.15 A copy of BCN 118A is produced with this Response.

3. RELIANCE ON GUIDANCE WHICH IS NOT RELEVANT TO COMMISSIONING UNDER THE PROJECT AGREEMENT

3.1 PPP6 appears to rely on guidance on commissioning which is either (i) not directly relevant to the Project or (ii) albeit relevant was not written with PFI/NPD projects in mind and so needs to be considered in the appropriate context.

SCIM Guidance on commissioning

3.2 The Inquiry Team has relied upon the Scottish Capital Investment Manual (SCIM) guidance on commissioning in the preparation of PPP6. The Inquiry Team acknowledges at paragraph 3.1.2 of PPP6 that the SCIM guidance on commissioning is not referred to in the contract documents but nevertheless suggests that it represented best practice (paragraph 3.2.6).

3.3 If it is the case that the SCIM guidance on commissioning is being used as a benchmark of best practice and the Project Agreement/Construction Contract is being analysed against that, it appears to IHSL that such an analysis would be highly technical exercise and not particularly relevant to PPP6 given its stated purpose of exploring the factual background.

3.4 The reference to the SCIM guidance on commissioning in PPP6 does lead at times to speculation and conjecture. For example, at paragraph 3.2.7 of PPP6, reference is made to a "Commissioning Master Plan (CMP)" which is a concept referred to in the SCIM guidance on commissioning and then speculates about what the Commissioning Master Plan might be and what the "user requirements" might be. The CMP has no relevance to the Project Agreement and the Construction Contract; the issue is hypothetical.

3.5 The reliance on the SCIM guidance in light of the acknowledgement in PPP6 that the guidance wasn't referred to in the contract documents appears to be contradictory. The commissioning guidance in the SCIM manual is not directly relevant to the Project Agreement, Construction Contract or the Services Contract. The Project Agreement does set out what standards and guidance were relevant to commissioning. It is not clear on what basis the Inquiry Team considers that the guidance referred to in the Project Agreement does not reflect best practice.

Relevant guidance has been applied too literally

3.6 There are occasions where PPP6, whilst referring to relevant guidance, applies that guidance (which is not written with PFI/NPD projects in mind) too literally to the Project and the contract documents. For example:

3.6.1 Paragraph 3.3.3 of PPP6 refers to the concept of "Works Staff" which is taken from the 'Guidance on Engineering Commissioning'. There is no concept of "Works Staff" in the contract documents. PPP6 speculates on who might be "Works Staff" on the Project and assumes (wrongly IHSL understands) that it would be BYES (as the Services Provider). That speculation and conjecture is unnecessary and unhelpful. The Services Contract sets out BYES's role on the Project.

3.6.2 Paragraph 3.3.9 of PPP6, referring to the Guidance on Engineering Commissioning identifies the concepts of "Project Engineer" and "Client's Commissioning Adviser". There are no such roles specified in the contract documents. PPP6 speculates (wrongly IHSL understands) that these roles would have been undertaken by the Independent

Tester. That speculation and conjecture is unnecessary and unhelpful. The Independent Tester's Contract sets out the Independent Tester's role and responsibilities.

3.6.3 Paragraph 4.2.24 of PPP6, again referring to the Guidance on Engineering Commissioning, refers to the provision of commissioning reports and assumes (wrongly IHSL understands) that these would have been prepared by the Independent Tester.

3.7 The Inquiry Team recognises that the guidance was not written with privately financed or NPD projects in mind and understands that aspects of the contract documents for the Project will diverge from that guidance (paragraph 3.1.1. of PPP6). However, by applying that guidance too literally to the Project it appears that PPP6 misconstrues the parties' roles and responsibilities as set out in in their respective contracts.

4. BYES' ROLE IN COMMISSIONING

4.1 Paragraphs 3.3.4 and 3.3.5 of PPP6 seek to describe BYES's involvement in commissioning. IHSL is concerned that the Inquiry Team have misunderstood BYES's role.

4.2 Paragraph 3.3.5 of PPP6 purports to quote text from paragraph 2.12 of "*Schedule Part 5 of the Services Contract."* The text quoted in paragraph 3.3.5 is not in fact taken from the Services Contract. Instead, it has been taken from Schedule Part 5 of the Interface Agreement between IHSL, MPX and BYES. The Interface Agreement is a tripartite agreement; its purpose is to set out the arrangements primarily between MPX and BYES in connection with matters which are the subject of the Construction Contract and the Services Contract.

4.3 Schedule Part 5 of the Interface Agreement consists of a document entitled "*FM Guide to Design & Construction*". It is an extract from that document which has been quoted at paragraph 3.3.5 of PPP6. However, the document contained in Schedule Part 5 of the Interface Agreement does not set out BYES's obligations with regards to commissioning. Schedule Part 5 is referred to in the definition of "FM Design requirements" in Section 2 of the Interface Agreement. "FM Design Requirements" means *"the requirements of the Service Provider set out in Schedule Part 5 and Schedule Part 6 of this Agreement".*

4.4 As a result of the Inquiry Team's reliance on the extract from the document in Schedule 5 to the Interface Agreement it has misconstrued BYES's role under the Services Contract with regards to commissioning.

4.5 The Inquiry Team also appear to have misconstrued the text itself. The text does not say that all commissioning should be witnessed by BYES. It states that all mechanical and electrical installations will be fully commissioned and tested in service; the commissioned system will then be witnessed by BYES. This is in the context of in-operation familiarisation training.

4.6 Paragraph 17.1 of the Services Contract provides that BYES should liaise with MPX in respect of any comments they might have on the Final Commissioning Programme (which is the programme jointly developed and agreed between the Board and Project Co and, in turn, MPX) as defined under the Project Agreement.

4.7 Schedule Part 10 of the Services Contract refers to Appendix 2, Item 5a of Schedule Part 2 of the Interface Agreement. Schedule Part 2 of the Interface Agreement sets out the division of responsibility between MPX and BYES and the parties' respective rights and obligations. An extract of that Schedule Part 2 to the Interface Agreement is provided below:

No.	Issue	Contractor's rights and obligations	The Service Provider's rights and obligations
4.	**Access prior to Actual Completion**	The Contractor shall subject to the terms of the Construction Contract allow the Service Provider the right of access to the relevant Site(s) for the purposes of carrying out its obligations in accordance with the Services Contract. The Contractor shall provide to the Service Provider, at its own expense, a copy of the site rules as soon as reasonably practicable and in advance of the Service Provider 's required access. In performing the Works the Contractor shall not unreasonably hinder the Service Provider in the carrying out of its subcontract obligations	The Service Provider shall comply with all relevant safety procedures, which shall include any relevant health and safety plans for the construction of the work, the Contractor's site rules and any reasonable directions with regard to site safety issued by the Contractor from time to time. In fulfilling its subcontract obligations the Service Provider shall not unreasonably hinder the Contractor in the carrying out of the Works.
5.	**Programme and Final Commissioning Programme**	The Contractor shall make available to the Service Provider the Programme and shall consult with the Service Provider on the Final Commissioning Programme. The Contractor shall invite the Service Provider (with reasonable notice not being less than three (3) months) to witness as appropriate testing and final commissioning of facilities. The Service Provider acknowledges that the details and sequence of commissioning activities may be subject to change.	
5a	Post Completion Commissioning	The Contractor shall support the Board in the Board achieving a "clinically clean" standard by responding promptly to rectify any Construction Defects including in respect of the Handover Clean.	The Service Provider shall support the Board in the Board achieving a "clinically clean" standard by responding promptly to any request from the Board to provide Services including for the avoidance of doubt Maintenance Works in respect of the Plant or Group 1 Equipment as required.

4.8 Item 5 indicates that MPX was obliged to invite BYES to witness as appropriate testing and final commissioning of the facilities. BYES's obligations did not include witnessing or attending the commissioning.

4.9 Consequently, the Inquiry Team's understanding set out at paragraph 3.3.6 of PPP6 that BYES (pursuant to the Services Contract) was to witness the commissioning of all mechanical and electrical installations is incorrect. This error is repeated at various parts of PPP6 (e.g. at paragraphs 3.4.6, 4.2.31 and 4.2.39).

4.10 This misunderstanding of BYES's role has led the Inquiry Team to erroneous observations. For example, at paragraph 4.2.39 of PPP6 the Inquiry Team states that "*in light of its understanding that BYES did not witness commissioning of AHU 04-06, the Inquiry team are consequently of the understanding that no party may have been trained to operate and maintain this equipment."* The Inquiry team has not only applied its erroneous understanding of BYES's role (i.e. that BYES was to witness all commissioning of the mechanical and electrical installations) it has also wrongly conflated a purported failure to witness commissioning with a lack of training on how to operate the installation.

That simply does not follow; the Inquiry Team's understanding that there was a lack of training on the operation and maintenance of the equipment is unfounded.

4.11 In fact, BYES was on site undertaking training and familiarisation of the systems for a longer period prior to completion of the Project than might normally be expected. That was because completion was due to take place well before February 2019 but due to the dispute between NSHL, IHSL and MPX the anticipated completion of the Project was pushed back on various occasions. BYES personnel were on site prior to Completion for a considerably longer period than the Services Contract would otherwise have anticipated.

4.12 IHSL have addressed its concerns regarding the Inquiry Team's reliance upon and application of the SCIM and the 'Guidance to Engineering Commissioning' at Section 3 (above) of this Response. One example where a literal but inaccurate application of the Guidance to Engineering Commissioning has led to an error in defining BYES's role is found at paragraphs 3.3.3 and 3.3.4 of PPP6. Paragraph 3.3.3 of PPP6 quotes from paragraph 6 of that Guidance which refers to the "*Works Staff of the user authority"* being involved in the final witnessing and demonstration as part of the familiarisation process. In the absence of a definition of "Works Staff" in the Guidance the Inquiry Team has assumed that must mean the party responsible for ongoing maintenance of the equipment. Given BYES were appointed under the Services Contract to perform ongoing maintenance of the equipment, the Inquiry team has wrongly assumed that BYES fits the definition of "Works Staff".

4.13 This is superimposing a concept and a term from the Guidance that does not necessarily fit neatly (or at all) into the NPD structure. There is no mention within the Services Contract that BYES are the 'Works Staff' for the purposes of that Guidance. The assumption that BYES are the 'Works Staff' does not appear to IHSL to be correct. IHSL understands the reference in the Guidance to "*Works Staff of the user authority*" to be more appropriately referring to the operators of the equipment in the hospital (e.g. the clinicians) and those responsible for the day-to-day use of certain equipment and apparatus.

4.14 IHSL considers it would be helpful to canvass detailed comments from BYES with respect to certain matters addressed in PPP6 in order to assist the Inquiry and is liaising with BYES in this regard.

5. INDEPENDENT TESTER'S ROLE

5.1 IHSL is concerned that the Inquiry Team may have misunderstood the role of the Independent Tester.

Misunderstanding of the Independent Tester's Role

5.2 Paragraph 2.1.12 of PPP6 refers to the Independent Tester Contract, the terms of which are set out in the form contained in Schedule Part 13 to the Project Agreement. The Independent Tester Contract was executed by the relevant parties at Financial Close along with the other project documents. Project Co and the Board jointly appointed the Independent Tester to perform the services obligations

and tasks which were ascribed to the Independent Tester under the Project Agreement (and which were set out in Appendix 1 to the Independent Tester contract). The Independent Tester's role and responsibilities were therefore carefully defined.

5.3 IHSL have addressed its concerns regarding the Inquiry Team's reliance upon and application of the SCIM guidance and the 'Guidance to Engineering Commissioning' at Section 3 (above) of this Response. The Inquiry Team's application of that guidance has resulted in errors in the Inquiry team's understanding around the Independent Tester's role.

5.4 At paragraph 3.3.7 of PPP6 the Inquiry team quotes from paragraph 7 of the Guidance to Engineering Commissioning which refers to the roles of the "Project Engineer" and the "Client's Commissioning Adviser". Notwithstanding that the Inquiry Team's acknowledgement at paragraph 3.1.1 of PPP6 that the guidance was not written with privately financed projects or NPD projects in mind, the Inquiry Team has sought to overlay roles and concepts from the guidance into the contractual documents where those roles and concepts are not otherwise found. The Independent Tester was neither the "Project Engineer" nor the "Client's Commissioning Adviser". The Independent Tester's role was specifically defined in the Independent Tester's Contract and its services undertaken for the benefit of both NHSL and IHSL.

The relevance of SA1 to the Independent Tester Contract and issue of the Certificate of Practical Completion

5.5 One of the duties of the Independent Tester was to issue the Certificate of Practical Completion in accordance with the Project Agreement (item 1.4 of Appendix 1 to the Independent Tester Contract). Another of the duties was, following notification by Project Co under the Project Agreement, "*to inspect and comment as required on the Works as required by the Completion Process."*

5.6 Clause 17.12 of the Project Agreement states that "*pursuant to the terms of the Independent Tester Contract, the parties shall procure that the Independent Tester, when he is satisfied that the Facilities and the Retained Estate Handback Infrastructure are complete in accordance with the Completion Criteria, issues a Certificate of Practical Completion to that effect to the Board and to Project Co."* The "Completion Criteria" means the Completion Tests as defined in Appendix B of Schedule Part 10. Item 2.1.4 of the Completion Criteria is that "*all mechanical and electrical Plant and systems shall be tested, commissioned and operate satisfactorily in accordance with the specified design criteria, any manufacturer's operating requirements and the Room Data Sheets."*

5.7 Clause 17.13 of the Project Agreement provide that the issue of the Certificate of Practical Completion shall, in the absence of any manifest error, bad faith or fraud, be conclusive evidence (but only for the purpose of ascertaining the Payment Commencement Date) that the Facilities and Retained Estate Handback Infrastructure were complete in accordance with the Completion Criteria on the date stated in the Certificate of Practical Completion.

5.8 The Inquiry team should be aware of the relevant provisions of Settlement and Supplement Agreement 1 ("**SA1**") dated 22 February 2019 (which is also addressed in Section 6 below). Recital D of SA1 states:

"*The Parties understand that the Independent Certifier has completed the tests on completion in respect of the Works (other than the Post Completion Works and Outstanding Works) and, subject to: (i) the terms of the Project Agreement as supplemented by this SA1; and (ii) the conditions set out in the Independent Tester's letter to Project Co dated 7 February 2019; is ready to issue a Certificate of Practical Completion on or about the SA1 Effective Date".*

5.9 Clause 1.1 of SA1 stated that it was supplemental to and amended the Project Agreement, and from the SA1 Effective Date, the Project Agreement was to be read and construed as supplemented by the provisions of SA1.

5.10 Clause 3.1 of SA1 stated that Project Co was obliged to "*design, construct, test, commission and complete the Works (other than the Post Completion Works and Outstanding Works) and Facilities in accordance with the Project Agreement as amended by the Agreed Resolution so as to satisfy the Completion Criteria as amended by the Agreed Resolution and all other terms of the Project Agreement (as revised pursuant to this SA1) and this SA1".*

5.11 The "Agreed Resolution" was defined in SA1 as "*the technical solution required to resolve the Dispute (other than the Post Completion Disputed Works) and the obligations on each Party to meet (or procure the meeting of) that agreed technical solution all as detailed in the column entitled "Description of Agreed Resolution" in Part 1 of the Schedule (Technical Schedule)."*

5.12 With regards to the 4 bed ventilation, the Technical Schedule described the dispute as follows:

"*In relation to ventilation pressure regimes, the Board believes Project Co's design for the 4 bed ventilation is non-compliant with the Board's Construction Requirements ("BCRs"), Project Co Proposals ("PCPs"), SHTM Guidance and also non-compliant with comments made by the Board on the Environmental Matrix in the Reviewable Design Data schedule at Financial Close….*

From a clinical perspective, the principal concern to the Board in continuing with Project Co's proposed pressure regime design means there is an unacceptable risk of the spread of bacterial airborne infections into corridors and surrounding patient rooms (positive to the corridor)….

The Board requires the pressure regime to be balanced or negative to the corridor."

5.13 The Agreed Resolution is described as being "*for 14 No. 4 bed rooms to be balanced or negative to the corridor at 4 ac/hr. The remaining 6 No. 4 bed rooms remain as per the environmental matrix…."*

5.14 Clause 3.2 of SA1 stated that the Board and Project Co agreed that the Agreed Resolution "*shall be used by the Independent Tester for the purposes of interpreting the relevant aspects of the*

Completion Criteria as amended by the Agreed Resolution for those parts of the Works (other than the Outstanding Works and the Post Completion Works) detailed in Part 1 of the Schedule (Technical Schedule) which are the subject of the Dispute…. and, for the avoidance of doubt, the provisions of clause 17 (Pre-Completion Commissioning and Completion) of the Project Agreement apply (subject to clause 3.5) mutatis mutandis to the Works as amended by the Agreed Resolution (other than the Outstanding Works and the Post Completion Works) for the purposes of the Independent Tester issuing the Certificate of Practical Completion for the Works as amended by the Agreed Resolution (other than the Outstanding Works and Post Completion Works)."

5.15 Pursuant to clause 3.3 of the SA1, Project Co and the Board agreed to instruct their respective Representatives to jointly instruct the Independent Tester to procure that the Independent Tester shall issue the Certificate of Practical Completion pursuant to Clause 17.12 (Completion Certificate) of the Project Agreement (as revised by SA1) when he was satisfied that the Facilities were complete in accordance with the Completion Criteria as amended pursuant to SA1 and the other relevant provisions of the Project Agreement (as revised pursuant to SA1).

5.16 In other words, the Completion Criteria were to be considered in light of the terms of SA1 and the Agreed Resolution contained therein, and the Independent Tester was to certify completion when satisfied that the Facilities were complete in accordance with the Completion Criteria as amended by SA1.

5.17 The Board and IHSL issued the "Independent Tester Varied Services Letter" to the Independent Tester dated 22 February 2019 instructing the Independent Tester to issue the Certificate of Practical Completion pursuant to Clause 17.12 (Completion Certificate) of the Project Agreement when he was satisfied that the Facilities were complete in accordance with the Completion Criteria as amended by the Agreed Resolution in SA1. A copy of that letter is included with this Response.

5.18 The Independent Tester issued the Certificate of Practical Completion certifying that the Facilities were completed in accordance with the Completion Criteria as amended by the Agreed Resolution also on 22 February 2019. This chronology is explained at Section 6 below.

Inquiry's questions around the Independent Tester's actions

5.19 IHSL notes that the Inquiry team has identified a number of "unknowns" around what the Independent Tester did or did not do or the reasons why the Independent Tester took certain steps.

5.20 IHSL's view is that the Independent Tester is best placed to address these matters and the Inquiry team should not draw any conclusions on those matters in the absence of the relevant information.

6. **SETTLEMENT AND SUPPLEMENTAL AGREEMENT 1 ("SA1")**

6.1 SA1 was supplemental to and amended the Project Agreement. It records (amongst other things) the works carried out to resolve the dispute relating to the ventilation system for the single and multi-bed rooms so that they achieved a balanced or negative pressure relative to the adjacent corridor.

6.2 Para 2.1.7 of PPP6 observes that the Certificate of Practical Completion was issued on the same date as SA1. Likewise, paragraph 4.2.18 of PPP6 notes that the Certificate of Practical Completion was issued on 22 February 2019, which is the same date as SA1. The apparent inference drawn by the Inquiry team from this is that the "*commissioning of the ventilation equipment could not have been completed prior to the Certificate of Practical Completion being issued… because the specifications against which certain equipment was to be verified were signed off on the same day as the Certificate was issued."* The Inquiry team (understandably) has misunderstood the timeline of events at the execution of SA1 and the issue of the Certificate of Practical Completion.

6.3 On 13 March 2018, NHSL wrote to IHSL regarding the ventilation system to the four-bedded rooms. In that letter, it was acknowledged that it was in the best interests of the Project for parties to reach a negotiated "*resolution of the ventilation and all other construction-related issues*" that had arisen. Included in the letter was also a copy of a draft Summons which NHSL had prepared in contemplation of raising court proceedings (the Summons was never issued formally).

6.4 At this stage (March 2018), the parties (NHSL, IHSL and Multiplex) engaged in a lengthy period of negotiation which dealt with not only the issue of whether the single and multi-bed rooms should achieve a balanced or negative pressure relative to the adjacent corridor, but also all other ongoing disputes between the parties on the design and construction of the RHCYP/DCN (noting that none of the disputes related to the air change rate in the Critical Care rooms). Those discussions culminated in execution of SA1 on 22 February 2019.

6.5 NHSL, IHSL and MPX reached agreement on the resolution of the dispute on the air pressure regime for the single and multi-bed rooms in 2018 whilst the discussions on the other disputed matters continued. This allowed MPX to undertake those works and implement the agreed resolution throughout 2018, pending execution of SA1. The other on-going disputes between the parties at that time held up the execution of SA1. The parties had anticipated that SA1 may be capable of being executed in the latter half of 2018 but ultimately it was not executed until February 2019.

6.6 Consequently, by the date of the execution of SA1, the works implementing the agreed resolution for the single and 4-bed rooms pressure regime had already been completed and the testing and commissioning of those systems undertaken. SA1 therefore reflected a resolution which had in fact already been implemented as at the date of its execution. The commissioning undertaken prior to the Certificate of Practical Completion was carried out on the ventilation systems that had been reworked in accordance with the agreed resolution set out in the Technical Schedule.

6.7 As noted in Section 5 above, Recital D to SA1 acknowledged that NHSL and IHSL understood that the Independent Tester had completed the tests on completion in respect of the Works and was ready to issue a Certificate of Practical Completion on or about the date of the execution of SA1. As further noted above, the Completion Criteria were amended to reflect the terms of SA1 and the Independent Tester was obliged to issue the Certificate of Practical Completion when satisfied that the Facilities had been completed in accordance with the Completion Criteria as amended by the Agreed Resolution. The Agreed Resolution had already been implemented when the Certificate of Practical Completion was issued. The Certificate of Practical Completion confirmed that the Works had been completed in accordance with SA1.

7. THE JANUARY 2019 CORRESPONDENCE

7.1 Section 5 of PPP6 largely addresses NHSL internal discussion and correspondence and IHSL is unable to provide comment on those matters.

7.2 Section 5 does, however, refer to the 'Director-General Health & Social Care and Chief Executive' letter dated 25 January 2019 ("**Chief Executive's Letter**") which was issued to NHS Chief Executives (and copied to Directors of Estates). The Chief Executive's letter is headed "*Queen Elizabeth University Hospital – follow up actions".* A copy of the Chief Executive's Letter was, in turn, issued by NHSL's Brian Currie to IHSL under cover of NHSL's letter dated 28 January 2019.

7.3 It is not clear to IHSL what relevance the Chief Executive's Letter has in relation to the commissioning matters addressed in PPP6. Nevertheless, IHSL makes certain observations on the Chief Executive's Letter and the subsequent response made by IHSL.

7.4 First, the Chief Executive's Letter was issued to NHSL on 28 January 2019 i.e. before the RHCYP/DCN reached practical completion. It's wrong, therefore, to categorise this correspondence as being a "post-completion event". The Chief Executive's Letter was issued to IHSL prior to the issue of the Certificate of Completion by the Independent Tester and prior to the commencement of the provision of the Services under the Project Agreement (and, in turn, the Services Agreement).

7.5 Second, some of the text quoted by the Inquiry Team at paragraph 5.6 of PPP6 does not appear in the signed copy of the Chief Executive's Letter which was issued to IHSL on 28 January 2019. It is not clear to IHSL if the text quoted in the first two paragraphs of paragraph 5.6 is taken from an earlier draft of the Chief Executive's Letter which was then subsequently revised prior to issue or if there are two versions of the letter in circulation. Nevertheless, that text quoted in the first two paragraphs of paragraph 5.6 of PPP6 but omitted from the signed letter issued to IHSL does provide helpful context.

7.6 The text quoted at paragraph 5.6 makes clear that the letter was being issued "*following the ongoing incident at QEUH".* It was issued following a meeting of the Strategic Facilities Group which took place on Wednesday 23 January 2019 at which the on-going incident at QEUH was discussed at

length. The text refers to an issue regarding infections in QEUH and whilst further intelligence was being gathered there were a number of controls that the Chief Executive wanted to confirm were in place and working effectively. It appears, then, that the Chief Executive's Letter was issued following an incident unrelated to RHCY/DCN with a particular focus on operational facilities (and not necessarily to facilities still under construction).

7.7 Third, the Chief Executive's Letter issued to IHSL on 28 January 2019 had a particular focus. It stated as follows:

"*This letter sets out the actions following the meeting of the Strategic Facilities Group on Wednesday 23 January. There are a number of controls that I would like you to confirm are in place and working effectively.*

- *All plant rooms must be secure and have adequate access controls in place at all times;*
- *All plant rooms maintained clean and free of vermin;*
- *Standard Operating Procedures for the management of plant rooms are in place and being followed;*
- *All critical ventilation systems* ***inspected and maintained*** *in line with 'Scottish Health Memorandum 03-01: Ventilation for healthcare premises'."* (emphasis added)

7.8 The majority of the actions relate to plant rooms (namely measures around their security, cleanliness and operation). The fourth bullet point, however, asks for confirmation that all critical ventilation systems are inspected and maintained in line with SHTM 03-01. Critically, the fourth bullet point does not ask for confirmation that critical ventilation systems have been designed and installed in line with SHTM 03-01.

7.9 SHTM 03-01 is published in two parts. Part A deals with the design and installation of ventilation systems; Part B covers operational management. The fourth bullet point in the Chief Executive's Letter is concerned with the inspection and maintenance of ventilation systems i.e. matters which are addressed in Part B of SHTM 03-01. The Chief Executive's Letter has a specific and relatively narrow focus. As at January 2019, the Project had not reached Completion and IHSL's operational services would not yet have commenced.

7.10 Fourth, upon receipt of the copy of the Chief Executive's Letter from NHSL, IHSL in turn issued a copy of the letter to MPX (as the Construction Contractor) and BYES (as the Service Provider) and invited their responses.

7.11 MPX responded to IHSL by letter dated 31 January 2019 addressing each of the four bullet points in the Chief Executive's Letter. In response to the fourth bullet point, MPX responded as follows:

"*All ventilation systems have been designed, installed and commissioned in line with STHM 03-01 as required systems are maintained in such a matter which allows handover at actual completion to meet SHTM 03-01 standards".*

7.12 MPX has in responding to the fourth bullet point exceeded what was being requested by the Chief Executive's Letter – the Chief Executive's request concerned confirmation of the inspection and maintenance of critical ventilation systems (not their design or installation). MPX's response also reflects that the RHCYP/DCN had not yet reached actual completion.

7.13 BYES responded to IHSL by letter dated 29 January 2019. In its response, BYES stated that "*all equipment on site within BYES scope of service … will be maintained to satisfy all regulatory requirements including the Scottish Health Technical Memorandum items (SHTMs)".* This response recognises that BYES's inspection and maintenance obligations had not yet commenced.

7.14 Upon receipt of MPX's and BYES' letters, IHSL consolidated those responses in its letter to NHSL dated 31 January 2019.

7.15 Fifth, the Independent Tester subsequently issued the Certificate of Practical Completion certifying that the Completion Criteria had been met. One of those criteria was that the mechanical and electrical systems had been tested, commissioned and operated satisfactorily in accordance with the specified design criteria.

7.16 A copy of the signed Chief Executive Letter, BYES's letter dated 29 January and MPX's letter dated 31 January 2019 are appended to this Response.

7.17 In summary, the context in which the Chief Executive's Letter was issued is significant. It followed a particular incident at QEUH which was unlreated to RHCYP/DCN. It was circulated to all NHS Chief Executives i.e it was not specfic to RHCYP/DCN. In so far as it referred to SHTM 03-01, the Chief Executive's Letter sought confirmation that ventilation systems were inspected and maintained in line with SHTM 03-01. It sought no such assurance regarding the design and installation of critical ventilation systems. The correspondence with NHSL had no contractual status (e.g. it was not issued pursuant to the Project Agreement). NHSL's letter to IHSL did not invite any comment on the design and installation of the ventilation systems. IHSL's response (based on the responses it received from MPX and BYES) was issued to NHSL in order to assist NHSL in providing its own response to the Chief Executive's Letter within the required timescales and not for any other purpose.

7.18 In any event, as has been explained by IHSL elsewhere in its written submissions to the Inquiry, the Project Agreement required compliance with SHTMs unless the Board's Construction Requirements expressed a different requirement. Compliance with SHTMs was expressly subject to NHSL's own express requirements and, therefore, the comment that the ventilation systems had been designed and installed in line with SHTM 03-01 "*as required*" requires to be construed in that contracutual context.

7.19 Separately, there is an error in the final paragraph of paragraph 5.6 of PPP6 which states that the letter from IHSL to NHSL dated 31 January 2019 "*does detail the derogations from SHTM 03-01*". This is incorrect. The letter dated 31 January 2019 from IHSL in response to NHSL's request for confirmation did not detail the derogations. The omission of the word "not" in paragraph 5.6 of PPP6 requires to be corrected accordingly.

25 August 2023

APPENDICES

No.	Appendix
1	Board Change Notice 118A (regarding the O&M Manuals)
2	Independent Tester Varied Services Letter dated 22 February 2019
3	Letter from NHSL to IHSL dated 28 January 2019 enclosing copy of Chief Executive's Letter
4	Letter from MPX to IHSL dated 31 January 2019
5	Letter from BYES to IHSL dated 29 January 2019

SCOTTISH HOSPITALS INQUIRY

RESPONSE TO PROVISIONAL POSITION PAPER 6 OF THE INQUIRY

ON BEHALF OF

GREATER GLASGOW HEALTH BOARD

Introduction

1. Greater Glasgow Health Board ('NHSGGC') welcomes the opportunity to comment on Provisional Position Paper 6 ('PPP6') of the Inquiry. NHSGGC notes that PPP6 is directed, in particular, at the commissioning and validation of the ventilation system at the Royal Hospital for Children and Young People and Department for Clinical Neurosciences, Edinburgh (RHCYP/DCN).

2. Whilst PPP6 primarily concerns the RHCYP/DCN, the scope of section 3 of PPP6 in particular is wider. The summary of guidance and the relationship with contractual provisions is of more general application and may have a bearing on the terms of reference as directed at the QEUH/RHC. NHSGGC therefore wishes to comment on that aspect of PPP6. NHSGGC makes no comment on the remaining sections of PPP6 which specifically concern the RHCYP/DCN.

3. NHSGGC notes that the Inquiry's Request for Information No.18 concerns the QEUH/RHC ventilation system. NHSGGC invites the Inquiry to have regard to the full terms of its response to that Request for Information.

Applicable guidance and contractual provisions

4. Counsel to the Inquiry states in PPP6 that "the guidance discussed below formed best practice for all aspects of commissioning and validation" and "sets out the minimum standards by which ventilation equipment at the RHCYP/DCN was to be commissioned and validated. Secondly, it sets out the best practice relevant to all parties involved in the

project". NHSGGC takes no issue with the summary of the content of guidance referred to in PPP6, in particular NHSGGC agrees with the summary of the content of SHTM 03-01, SCIM and the CIBSE Commissioning Code A.

5. NHSGGC notes that the applicability and status of guidance needs to be seen in the context of the particular project documentation with respect to NHSGGC. It is not possible to draw any conclusions as to the status of any guidance, or its applicability, without putting that guidance into the context of the hierarchy of contractual documentation. It is essential to analyse the contractual documentation to determine the applicability of the guidance within the contractual context. For example, the definition of "commissioning" and "validation" in so far as they relate to QEUH/RHC needs to be seen in the context of the documents that relate to the project.

6. The design and commissioning of ventilation at QEUH/RHC was the responsibility of the contractor (Multiplex), checked by the project supervisor (Capita). The Inquiry is yet to hear any evidence in respect of the design, build, commissioning, validation, operation and maintenance of the ventilation system at QEUH/RHC. The Inquiry has not yet heard evidence in connection with the contractual provisions relevant to the QEUH/RHC or the roles of those involved in those stages of the project.

7. NHSGGC notes that the Design and Build contract with Multiplex pre-dated the RHCYP/DCN contract. The Inquiry has not heard what constituted standard, accepted or best practice at the time the Multiplex contract was negotiated and signed. In any event, published and consultative versions of SHTM 03-01 (and its predecessors) is peer-produced guidance which supports, rather than replaces, appropriate management and engineering expertise, and compliance with it is not mandatory. The evidential basis for the standards set out in SHTM 03-01 has been questioned from a microbiological perspective by the Inquiry's ventilation expert, Professor Humphreys. There has been no evidence, in particular from infection control or epidemiologists, as to whether non-compliance with the guidance increased infection risk.

Conclusion

8. Whether what was ultimately installed met the contractual specification and applicable guidance requires factual, technical and expert evidence. The impact of any aspect of the design, build, commissioning, operation, validation and maintenance of the ventilation system on patient safety, and in particular any increased infection risk, requires evidence from, amongst others, epidemiologists and infection control experts. At present, the Inquiry has not yet heard any of that evidence. We note that expert evidence has been made available to the Inquiry from Dr John Hood and Dr Samir Agrawal in relation to airborne infection and we invite the Inquiry to have regard to those conclusions. At present, there is no evidence that the ventilation arrangements in the QEUH/RHC could be described as causing or contributing to any increased infection risk. NHSGGC welcomes the opportunity to address these issues at a future hearing.

RESPONSE ON BEHALF OF NHS LOTHIAN

TO THE PROVISIONAL POSITIONING PAPER 8 (PPP8)
ON
HOW THE POTENTIAL ISSUE IN THE CRITICAL CARE DEPARTMENT OF THE ROYAL HOSPITAL FOR CHILDREN AND YOUNG PEOPLE AND THE DEPARTMENT OF CLINICAL NEUROSCIENCES COULD HAVE BEEN DETECTED DURING THE CONSTRUCTION PHASE
(Submitted on 6 October 2023)

1. Introduction

1.1. The table in Appendix 1 sets out NHS Lothian's (NHSL's) response to the questions contained in section 8 of PPP8. Appendix 2 sets out NHSL's responses to the Inquiry's provisional conclusions contained in section 7 of PPP8. Appendix 3 sets out factual clarifications or corrections arising from the terms of PPP8.

1.2. The terms of PPP8 give rise to some broader issues which NHSL wishes to address by way of the following introductory observations and comments.

2. Hindsight and the contractual and commercial context

2.1. NHSL has already provided commentary to the Inquiry on the role of hindsight: see General Position Paper to the Provisional Position Papers issued by the Scottish Hospitals Inquiry submitted 3 February 2023. Those comments are particularly apposite when considering missed opportunities. What, in hindsight, might appear to be a clear-cut opportunity may, at the time, have been entirely engulfed by the "noise" that accompanies a massive infrastructure project and all the associated commercial pressures. Indeed, the fact that Settlement Agreement 1 (SA1) related to 81 outstanding issues gives an indication of just how difficult implementation of the Project Agreement had become during the construction phase and how poorly, in NHSL's view, IHS Lothian Limited, Multiplex (IHSL/MPX) and their supply chain had performed.

2.2. PPP8 defines "missed opportunity" at paragraph 1.15 as "any occasion where a different course of action had the potential to produce a more favourable outcome;

that is, the occasions where decisions or actions (taken or not taken) failed to detect the discrepancy when they conceivably could or should have." It is submitted that this definition is too wide to be useful. Perhaps more importantly, it establishes an unfair test by which to assess people's actions, since, on a literal reading, it requires the reality of the contractual and commercial context in which people were operating to be ignored. For instance, it might be said that "conceivably" every interaction involving the IHSL Environmental Matrix was a missed opportunity. Such a reductionist approach will not assist in identifying lessons that can be learnt.

2.3. In relation to the contractual and commercial context, there are three related aspects of the Project to which NHSL would invite the Inquiry to have particular regard.

2.4. Firstly, weight should be given to the fact that the Project Agreement was a PFI style design and build contract for which IHSL had full design responsibility (subject to operational functionality). The nature and purpose of the contract used was to transfer risk to the private sector. Although it is clear that NHSL and its technical advisors, Mott MacDonald Limited (MML), provided input into IHSL's design that went beyond operational functionality, NHSL had no obligation to provide such input. It was not NHSL's nor MML's function to supervise the Project.

2.5. Even so, PPP8 identifies missed opportunities as arising at points when NHSL were reviewing design: see paragraph 4.15 of PPP8. The implication of paragraph 4.15.1 is that there was a missed opportunity because the Production Group's review was restricted to operational functionality. However, that is all, under the Project Agreement, NHSL was entitled to review. Similarly, a missed opportunity appears to be identified at paragraph 4.15.7 from the fact that NHSL approved the IHSL Environmental Matrix twice "[d]espite a lack of agreement on some of the ventilation parameters". Status B only related to matters of operational functionality which the Inquiry has already acknowledged does not extend to environmental parameters. Without status B approval, construction could not commence and the pressure for progress was enormous.

2.6. The corollary of this is that PPP8 gives insufficient focus to identifying opportunities that were missed in the hands of the parties that were actually responsible for the design and construction of the ventilation system, that is IHSL,

MPX and TUV SUD. For instance, at paragraph 4.15.4, Guidance Note 15 is treated as a missed opportunity for NHSL or MML to identify the discrepancy. However, Guidance Note 15 was in a document that had become an IHSL document and its terms should have alerted IHSL, MPX and TUV SUD to the discrepancy. Crucially, the fact that Guidance Note 15 was altered by TUV SUD goes to highlight that the discrepancy had actually been identified, albeit NHSL was not told.

2.7. Secondly, it should be recalled that NHSL's Project Team was required to liaise not only with numerous internal bodies, such as: internal governance committees, the Clinical Management Team (CMT), the broader clinical teams, the Infection, Prevention and Control Team (IPCT), and Estates & facilities; but also with numerous external bodies, such as: IHSL, the Independent Tester, SFT, HFS, the Scottish Government, and regulatory authorities such as the City of Edinburgh Council. So, although the Project Team went beyond what it was required to do in terms of reviewing IHSL's design, this was just one aspect of a much wider role that the Project Team was fulfilling.

2.8. Lastly, given the approach taken in PPP8 and the fact that NHSL's review only extended to operational functionality, with the purpose of a PFI style contract being to transfer design risk to the private sector, the Inquiry may wish to consider whether the form of contract used for the Project is suitable for healthcare projects.

3. Single rooms and multi-bed rooms

3.1. The issue that resulted in the new Hospital not opening in July 2019 was confirmation that there were non-compliances with SHTM 03-01 for air change rates in single and multi-bed rooms in Critical Care.

3.2. In tracing how this came about, it is important to understand that the genesis of the discrepancy is different in relation to single rooms and multi-bed rooms.

Single rooms

3.3. In relation to single rooms, the Inquiry should understand that, throughout the Project, NHSL specified single rooms in Critical Care as being different to standard single bedrooms. Single rooms in Critical Care can be distinguished from other single rooms in the facility because they have different ventilation requirements a in terms of SHTM 03-01 and do not have en suites. Accordingly, when there is reference in PPP8 to NHSL, for example, providing comments on "single rooms", including various comments on the ventilation in the en suites, it should be recalled that NHSL did not intend these comments to extend to single rooms in Critical Care. This can be contrasted with TUV SUD's position: it intentionally designed all single rooms, including those in Critical Care (and haemato-oncology), to have 6ac/h as it considered this to be compliant with Guidance.

3.4. The NHSL approach was demonstrated in Janice Mackenzie's oral evidence during which, when discussing the HAI-SCRIBE report from November 2014, she drew a very clear distinction between "single bed rooms in Critical Care wards" and both "single bed rooms in a general ward" and "all single bed rooms in the hospital"[1]. The issue that had arisen, and which was deferred into the RDD process, did not relate to single rooms in Critical Care.

3.5. Further insight on this is provided by the document entitled "Environmental Matrix Comments – 13 October 2014"[2] and the email from Graeme Greer (MML) to Brian Currie (NHSL) headed up "RHSC + DCN Single bedroom ventilation" with attachment[3]. These documents demonstrate that both NHSL and MML considered the ventilation issue that had arisen before Financial Close did not relate to single rooms in Critical Care. This is clear when it is recalled that:

(i) SHTM 03-01 stipulated 10ac/h in Critical Care Areas and not the 6ac/h referred to in these documents (which applied to "single room[s]");

[1] Janice Mackenzie transcript, 26 April 2023, p46. See also David Stillie's transcript, 27 April 2023, page 34.
[2] Bundle 4 for the April 2023 Hearing, page 276.
[3] Bundle 8 for the April 2023 Hearing, pages 69 to 71. Stewart McKechnie's oral evidence was to the effect that he understood this document to refer to single rooms throughout the Hospital: transcript, 4 May 2023, page 122.

(ii) SHTM 03-01 stipulated pressure of +10Pa for Critical Care Areas and not the "0 or -ve" referred to in these documents(which also applied to "single room[s]");

(iii) Critical Care Areas should not have had the mixed mode ventilation with openable windows as referred to in these documents; and

(iv) Critical Care bedrooms do not have en suites as referred to in these documents.

3.6. There are additional documents, referred to in Appendix 1 in response to question 8.5, which demonstrate that, during RDD, the focus of the discussion around the ventilation strategy leading to Project Co Change 051 and item 13 of SA1 related to single rooms with en suites.

3.7. NHSL did not intend to (and, arguably, did not) agree a derogation from the SHTM 03-01 in relation to single rooms in Critical Care in terms of item 13 of SA1. NHSL, therefore, does not accept paragraph 6.2 of PPP8 to the effect that, "The settlement agreement provided for 4ac/hr with a balanced pressure regime for single… rooms in the Critical Care Department." Similarly, at paragraph 6.4, the derogation in SA1 extended only to standard single rooms, it was not intended to and arguably did not extend to single rooms in Critical Care.

3.8. As PPP8 records at paragraph 9.3.3, Guidance Note 15, which had applied 10ac/h to Critical Care Areas, was changed, without NHSL being informed, so that it only applied to isolation cubicles in Critical Care Areas. That there was a fundamental difference in understanding as between IHSL and NHSL can be seen in the manner in which IHSL applied Project Co Change 051 and SA1 item 13, which related to the derogation from 6ac/h to 4ac/h in "single rooms", to single rooms in Critical Care. So far as NHSL was concerned, this derogation could never have applied to single rooms in Critical Care precisely because SHTM 03-01 stipulated 10ac/h to Critical Care Areas[4].

3.9. This fundamental difference in approach and understanding in relation to single rooms, as between NHSL on the one hand and IHSL/MPX/TUV SUD on the other, was not known or discussed between parties during the construction phase.

[4] See the Hulley & Kirkwood Thermal Comfort Analysis Report (Bundle 2 for the April 2023 Hearing, page 687) which expressly excludes Critical Care: *"As such, Critical Care and HDU type ward rooms which receive air change rates in the region of 10 ACH have not been analysed in this study."*

Multi-bed rooms

3.10. The issue that arose in relation to multi-bed rooms during construction related to the applicable pressure regime. NHSL considered that IHSL's design for ventilation in the multi-bed rooms throughout the facility was non-compliant with the BCRs, PCPs and SHTM 03-01. NHSL required the pressure regime to be balanced or negative to the corridor, which was not what IHSL had designed.

3.11. From a clinical perspective, the main concern to NHSL was that, if IHSL's proposed pressure regime continued, there would be an unacceptable risk of the spread of bacterial airborne infections into corridors and surrounding patient rooms. Following a risk assessment with input from IPC, the CMT and the clinical service leads (including Critical Care), it was decided that the hospital wide strategy was to have multi-bed rooms with balanced or negative pressure to allow cohorting of patients. It was agreed by way of item 7 in the SA1 that "14 of the 4 bed rooms were to be balanced or negative to the corridor at 4ac/hr", which included four multi-bed rooms in Critical Care. Six four-bed wards would remain as per the IHSL Environmental Matrix.

3.12. Four of the multi-bed rooms listed in item 7 of SA1 were multi-bed rooms in Critical Care (room numbers: 1-B1-009 (4 bed); 1-B1-031 (4 bed); 1-B1-063 (4 bed); and 1-B1-065 (3 bed). That was intentional. However, item 7 of SA1 also included a derogation from 6ac/hr to 4ac/hr. It is arguable that, in so doing, there was an inadvertent derogation from SHTM 03-01 on NHSL's part to a non-compliant number of air changes per hour for the multi-bed rooms in Critical Care.

4. Missed Opportunities

4.1. NHSL accepts that there were missed opportunities by all parties during the construction phase of the Project.

4.2. There was clearly a fundamental difference between NHSL/MML and IHSL/MPX as to the contractual status of the Environmental Matrix, both before and after it had been adopted and developed by IHSL. This extended into the construction phase. Although NHSL reminded IHSL during the construction phase that, in terms of the Project Agreement, NHSL did not accept any responsibility for the Reference Design (beyond operational functionality), this appears not to have

been understood by IHSL/MPX. There was, therefore, a missed opportunity during the construction phase, as there was before, for the parties to better understand their contractual obligations and/or to reach an agreed view on them. Even so, IHSL/MPX were aware of the overriding imperative on IHSL to build a facility that complied with all Guidance. Of course, standing Mr McKechnie's view that the ventilation regime in the IHSL Environmental Matrix was compliant with Guidance, it must be doubted that this truly was a missed opportunity.

4.3. There were, undoubtedly, lost opportunities by all parties during the RDD process. For instance, if the change that had been made to Guidance Note 15 on the IHSL Environmental Matrix had been brought to NHSL's attention in the manner agreed between the parties, then this would have identified the discrepancy.

4.4. There were missed opportunities for the Independent Tester, Arcadis, to advise IHSL and NHSL during commissioning that there were non-compliances with SHTM 03-01. See paragraph 5 of NHSL response to PPP6.

4.5. Finally, in the context of missed opportunities, the Inquiry may wish to reflect on the confusion that arose, as discussed above, between NHSL's understanding of the phrase "single rooms" (i.e. that it did not extent to single rooms in Critical Care) and IHSL's understanding (i.e. that it extended to all single rooms throughout the hospital). The language is found in the Guidance and it was always NHSL's intention that the Guidance should be followed. If the Inquiry takes the view that IHSL's approach was reasonable, then the question arises: how could the Guidance and the style of contract used in healthcare projects (and other PFI projects), including this particular Project Agreement, be improved so such a misunderstanding does not occur in the future.

Appendix 1

Response to Questions in Section 8 of PPP8

QUESTIONS		
8.1	Do you agree with the provisional findings and conclusions? Where the answer is no, can you please provide an explanation with supporting evidence?	No. See Appendix 2, which is non-exhaustive.
8.2	Can you provide a list of members and explain the role and function of the Children's CMT [Clinical Management Team]. Why was the Children's CMT asked to provide input on the risks and compromises related to ventilation?	The core members of the Clinical Management Team at that time were: • Fiona Mitchell (Director of Operations/General Manager for Children's services) • Edward Doyle (Associate Medical Director Women & Children) • Linda Cowie (Associate Director of Nursing (Women & Children) • Allister short (Service Manager) The core members of the CMT met weekly and a wider CMT group including additional members met monthly. The wider group included the core members along with: • Peter Campbell (Depute Associate Director of Nursing (Women & Children) • Sharon Russell (Clinical Nurse Manager for surgery), • Laura Reilly (Clinical Nurse Manager for Critical Care) • Gillian McFadyen (clinical lead for Critical Care) • Other clinical nurse managers within children's

QUESTIONS		
		• Other clinical leads within children's services. The role and function of the CMT was the day to day operational, strategic and management of the delivery of Children's Services at the old RHSC at Sciennes at the time, and due to transfer to RHCYP + DCN. The focus of the CMT was not on the Project in particular but it was a standing item on the monthly agenda and often the Project Clinical Director, Janice MacKenzie, and/or the Clinical Commissioning Manager, Dorothy Hanley, would provide a Project update at monthly CMT meetings. When required, Janice Mackenzie, would seek input on an ad hoc basis from either the core CMT, the broader CMT, or individual service leads/nurse managers. This was often done informally by way of telephone conversation or discussion. The Children's CMT were asked to provide input on the risks and compromises related to ventilation because it was for the CMT to decided how it wanted to manage the delivery of services to its patients in the new hospital. The decision around the ability to cohort patients in multi-bedded rooms (i.e. having a multi-bedded room with balanced or negative pressure as opposed to positive pressure) was a hospital wide strategy that was determined by the CMT and it was not solely about Critical Care. It was for the CMT, including senior clinical leads, to advise the Project Clinical

QUESTIONS		
		Director as to how they wished to deliver the service.
8.3	Were Critical Care Service Leads consulted on the concerns related to ventilation, specifically around pressure regime in 4 bed rooms?	Yes, see above. The Project Clinical Director recalls informal discussion with the Critical Care leads in relation to the cohorting of patients. The Risk Assessment for 4 bedded rooms could not have been prepared without consultation with Critical Care leads so its existence speaks for itself. The Risk Assessment for Critical Care was part of an overall risk assessment for the whole of the hospital. It was the result of an agreed hospital wide policy on how to cohort patients with the same infection. This was not a decision for the Project Clinical Director to make or risk assess on her own.
8.4	Please provide a copy of the 'cancelled FOI' referred to in email from Fiona Cameron, which referred to sub-optimal air change rates in clinical areas 56.	This request for information was not cancelled but put 'on hold' which means the deadline for response was extended with the agreement of the requester. The request for information was progressed under the Environmental Information (Scotland) Regulations 2004. Environmental Information Request (EIR) was responded to on 19 July 2018 and the documents disclosed under the EIR were previously provided to the inquiry under RFI 1 with index number 3.4_0273 and 3.4_0274. The EIR Response Letter has been submitted to the inquiry under index number PPP8_001. Sub-optimal air change rates in clinical areas referred to in Fiona Cameron's email relates to

QUESTIONS		
		the agreed derogation in multi bedded rooms which was documented in SA1.
8.5	Were risk assessments for the settlement agreement derogations from SHTM for neutropenic patients and single bedroom air change rates carried out? If yes, please provide these.	**Lochranza (Project Co Change 50 and Item 4 of SA1)** There was no written risk assessment but there was a meeting on 13 February 2017 with key individuals in which the risks were assessed and agreement was reached. The following people were in attendance at the meeting on 13 February 2017: - Janice MacKenzie (Project Clinical Director) - Dorothy Hanley (Project Manager) - Janette Richards (IPCT, Lead HAI Scribe Adviser) - Ann Cairney (Charge Nurse) - Pota Kalima (Consultant Microbiologist) - Mark Brougham (Consultant Paediatric Oncologist) - Ronnie Henderson (Commissioning Manager) The Project Team advised the Clinical Team that IHSL were advising that the ACH rate could not be changed without a significant amount of work, cost and delay in opening the hospital. The lead clinical nurse (Ann Cairney) and lead consultant (Mark Brougham) took a pragmatic view of the situation. It was recognised that IHSL were not providing a ventilation system that was compliant with SHTM 03-01 but in comparison to what was currently provided at RHSC (where there was minimal mechanical ventilation and no isolation rooms) that having

QUESTIONS		
		4ACH in single and multi-bed rooms, as well as 5 isolation rooms with 10 ACH, could be managed operationally. Project Co Change 050 and Item 4 of SA1 formalised this position. Item 13 of SA1 did not apply to Lochranza. **<u>Single Rooms not in Critical Care (Project Co Change 051 and Item 13 SA1)</u>** There was no formal risk assessment in relation to the decrease in air change rate in single rooms from 6ACH to 4ACH and the en suite extract rate from 10 ACH to 3ACH as recorded in Project Co Change 051 and item 13 of SA1. NHSL wishes to clarify that it did not intend to (and, arguably, did not) agree a derogation from the SHTM 03-01 in relation to single rooms in Critical Care in terms of item 13 of Settlement Agreement 1 (SA1) Project Co Change 051, which reflected TUV SUD's mixed mode ventilation strategy for single rooms Single rooms in Critical Care are not suitable for a mixed mode ventilation strategy and can be distinguished from other single rooms because: 1. They do not have en suites; 2. There should be no natural ventilation; 3. They do not have a starting point of 6ACH (it should be 10 ACH);

QUESTIONS		
		4. They do not have balanced / negative pressure (it should be +10 Pascals positive). By way of background, during the reference design period, Hulley & Kirkwood identified in their Thermal Comfort Analysis report (September 2011) that 4 mechanical air changes instead of 6 mechanical air changes would be adequate in respect of thermal comfort. The Inquiry is reminded that Hulley & Kirkwood's report expressly stated that its findings did not apply to Critical Care on the basis it required 10 ACH[5]. TUV SUD proposed a mixed mode ventilation strategy of 4 ACH mechanical supplemented by 2 ACH natural as part of its design strategy, for single rooms (with en suites). On 27 November 2014 TUV SUD produced an Air Movement Report with associated marked up drawings in support of this mixed mode ventilation strategy for single bedroom ventilation, circulated to NHSL on the 13h January 2015. The TUV SUD report and drawings specifically reference air movement and pressures in single bedrooms with en suites. NHSL did not consider that this report and associated design was applicable to single bedrooms in Critical Care, which did not have en suites or natural ventilation. There are other documents which demonstrate that the focus of discussions in relation to air

[5] See the Hulley & Kirkwood Thermal Comfort Analysis Report (Bundle 2 for the April 2023 Hearing, page 687) which expressly excludes Critical Care: *"As such, Critical Care and HDU type ward rooms which receive air change rates in the region of 10 ACH have not been analysed in this study."*

QUESTIONS		
		change rate in single rooms related to single rooms with en suites, for example: - In the diagram provided at page 186 of the SHI PPP8 joint bundle, there is a comparison of an SHTM 03-01 design against Project Co Design. Both diagrams show the floor plan of rooms, with en suites; and - In the Compromises Schedule at page 187 of the SHI PPP8 joint bundle, which was produced to help reach agreement with Project Co on a number of design and construction matters, it is of note that the discussion re "ventilation single bedrooms" expressly relates to rooms with en suites. In that document, the "reason for compromise" is stated as follows: *"Project Co's design is not in line with SHTM guidance in relation to air changes. Currently the only extract is via the ensuite, meaning this is 'dirty extract' which can't be used for heat recovery."* The "description for compromise" is as follows: *"Less air supply to the bedroom than recommended by SHTM and increased extract through en suite which will affect running cost of the Facility. No ability to recover heat from en suite dirty extract"* The mixed mode ventilation strategy for single rooms with en suites is then reflected in Project Co Change 051 and item 13.
8.6	What is the difference between a "general risk assessment" and an	There is no difference in the style forms used for a general or IPC risk assessment. The style

QUESTIONS		
	Infection Prevention and Control risk assessment?	forms are used across Scotland and the wider UK. The scoring and table to calculate the score allocated are the same across the whole of Scotland. Any difference would be dependent on who leads the risk assessment and the professional perspective that they adopt. An IPC Risk Assessment forms one dimension of an overall clinical risk assessment as risk of acquiring an infection while a patient is only one aspect of clinical risk or potential harm that can occur and would need considered along with other factors like risk of slips and falls and injury, risk of burns or scalding, risk of receiving the wrong treatment etc. An IPC risk assessment would be a focused assessment of the potential risk of someone acquiring an infection as a consequence of receiving healthcare or being present in a healthcare building. As such, the assessor should have training in infection pathogenesis, infection transmission routes, an understanding of the range of procedures or tasks performed in the area and the ecology of the healthcare environment being assessed along with an appreciation of the probability and likely severity and consequences to the patient/staff/visitor population who might acquire the infection(s) being risk assessed. It would also require an understanding of the range of interventions that can be employed to break infection transmission routes such as hand hygiene, personal protective equipment,

QUESTIONS		
		antimicrobial prophylaxis, ventilation system design and delivery, equipment decontamination, cleaning products and cleaning schedules, vaccination etc. It also involves an understanding of many basic medical sciences such as anatomy, physiology, immunology, microbiology and virology.
8.7	References to natural ventilation were removed in the EM for some Critical Care rooms. Despite this, the derogation for single rooms agreed in the settlement agreement required a supplement of 2ac/h from natural ventilation. The inquiry invites views from CPs on why this occurred.	This supports NHSL position that (i) Critical Care should have had solely mechanical ventilation at 10 ACH and (ii) the derogation in SA1 was not intended to (and, arguably, did not) apply to single rooms in Critical Care which should not have had any natural ventilation supply.
8.8	Despite the removal of natural ventilation from Critical Care rooms in the EM, the Inquiry understands that all nine rooms in Critical Care were ultimately constructed with openable windows and mechanical ventilation specification of 4ac/hr. Why was this?	NHSL was not aware that IHSL had constructed all rooms in Critical Care to have 4ACH until this issue was uncovered by IOM as a result of their validation testing in June 2019. IHSL did not submit and NHSL did not agree a derogation for single rooms in Critical Care from 10 ACH to 4ACH. Item 13 of SA1 was not intended to (and, arguably, did not) apply to single rooms in Critical Care from NHSL perspective.
8.9	Views are invited from CPs on whether the changes made to the EM were being communicated and actioned appropriately in the construction of the RHCYP.	Changes were not being communicated and actioned appropriately. As highlighted in the PPP, there were various failures to flag changes by IHSL to NHSL; there were delays by IHSL in making agreed changes to the EM; and sometimes changes were not made at all. NHSL's understanding was that IHSL would flag any material changes to them. They did not.

QUESTIONS		
		As an example in the versions of the EM up to and including FC, Guidance Note 15 contained reference to the requirement for 10ACH in both Critical Care areas and HDU areas. In Version 2 issued post FC in November 2015 the Critical Care reference was changed to state *'10 air change supply for Isolation cubicles'*. This change was not highlighted to NHSL in red whereas changes to other guidance notes were.
8.10	The Inquiry invites views from CPs on why the RDD process did not detect the specific requirements for air change rates and pressure regime in Critical Care areas.	The RDD process did not detect the specific requirements for air change rates and pressure regimes in Critical Care areas due to MPX M&E subcontractor, TUV SUD, view that their design of 4 ACH was compliant with SHTM 03-01. Accordingly, they did not consider there were any compliance issues to flag with NHSL/MML. In addition, MML, who were NHSL technical advisors, did not flag any inconsistences with Guidance in Critical Care in the EM in terms of air change rates or pressure regime.
8.11	Which department in the RHCYP/DCN housed "post-operative care beds", referred to in email by Brian Currie as potentially requiring positive pressure?	Routinely 'post-operative care beds' would be within Dunvegan/ Tantallon wards (Surgical Wards).If a patient had a particular specialist surgery, they would go back to the specialist ward they came from, which could either be Borthwick (Neuroscience), Lochranza (Haematology) or potentially Critical Care. For the DCN, post-operative care beds are either in the DCN acute care or the general ward. If any post-operative patient had an infection they would be placed in a single room in a surgical ward or an isolation room.

QUESTIONS		
8.12	Given the apparent challenges of the RDD process, is it an appropriate process to finalise the design of critical ventilation systems in clinical areas? If yes, why? Is there anything that could be done to improve it in future? If no, why? What alternative could be adopted in future?	In an ideal scenario, RDD is not an appropriate process to finalise the ventilation design of a hospital. However, for the RHYCP/DCN Project there were commercial, health system and NPD programme pressures which meant it was the only solution available at the time to (i) reach Financial Close and (ii) enable work to start building the new hospital. In terms of lessons learned, NHSL consider that the minimum requirement should be for all key and critical rooms/room types to be fully designed by the contractor and all design strategies (eg ventilation, thermal, structural, fire, etc) completed by the contractor in sufficient time for a full review by the Board and technical advisers with programme allowance for updating to reflect comments before financial close. The contractors must explicitly flag any non-compliances or conflicts with Guidance and submit any proposed derogations to the Board, even if it is a derogation the contractor considers the Board has specified. This was as per the terms of the Project Agreement for this Project but it did not happen.

Appendix 2

Response to Provisional Conclusions in Section 7 of PPP8

PROVISIONAL CONCLUSIONS		
7.1	The purpose of the RDD process is to finalise design elements, which includes clarifying construction requirements.	Suggest amend as underlined: The purpose of the RDD process was for IHSL, MPX and TUV SUD to finalise its design elements, which includes clarifying construction requirements. NHSL's approval of RDD items, including the EM, was only in relation to "operational functionality[6]". All design risk was transferred to IHSL.
7.2	The RDD process involved a thorough review of the Environmental Matrix. Mott MacDonald on behalf of the Board provided detailed comments which were signed off by the Programme Board and sent to Multiplex/TUV SUD. This resulted in a number of revisions, culminating in revision 11 version 33 in October 2017.	The RDD process involved a thorough review of IHSL Environmental Matrix by IHSL, MPX and TUV SUD. Mott MacDonald on behalf of the Board provided detailed comments on the EM, and sent those to Multiplex/TUV SUD. This resulted in a number of revisions, culminating in revision 11 version 33 in October 2017. The Programme Board were sighted on the key issues where appropriate.
7.3	During this process a multitude of issues were identified with the EM beyond those originally commented upon in the RDD schedule. Potentially important information about rooms in Critical Care was also removed. These represent missed opportunities during the RDD process to detect the discrepancy.	Suggest amend as underlined: Potentially important information about rooms in Critical Care was also removed by IHSL without always flagging changes with MML or NHSL as per the agreed process whereby any changes to the EM had to be highlighted in red. These represent missed opportunities during the RDD process for IHSL to have highlighted key changes to MML and NHSL which may have alerted them to the discrepancy in the air change rates for Critical Care.

[6] See clause 12.6.2: RDD items shall "be deemed to have satisfied the requirements of the Board in the manner and to the extent set out in Table A in Appendix 1 of Schedule Part 8 (Review Procedure) ("Table A"). Table A specifically states that in relation to each Approved RDD Item, such item has satisfied Operational Functionality.

PROVISIONAL CONCLUSIONS		
7.4	Amongst the issues identified in the EM were issues with the ventilation specifications in Critical Care areas. Specifically, this was in relation to the provision of en suites and the provision of natural ventilation.	NHSL confirmed to IHSL that because of the nature of the patients in Critical Care (they are ventilated) en suites were not required. Indeed, all rooms in Critical Care were designed and constructed by IHSL without en suites.
7.5	NHSL, Mott MacDonald, Multiplex and TUV SUD consulted and referred to SHTM 03-01 on a number of occasions during the construction phase. For example, NHSL identified and highlighted to Project Co that the specification contained in the EM for single bedroom air change rates and neutropenic patient areas was not compliant with SHTM 03-01. A decision was made to compromise on these items	Footnote 44 in this paragraph refers to paragraph 9.4.19 of PPP8 which contains a comment from MML in relation to single rooms with en suites. As noted elsewhere and in particular NHSL response to question 8.5 in appendix 1, single rooms in Critical Care do not have en suites.
7.6	An issue was also identified with the ventilation parameters provided for multi-bed rooms. The pressure regime provided in the EM for multi-bed rooms was positive but NHSL's position was that SHTM 03-01 recommended a negative or balanced pressure for all bedrooms including multi-bed rooms.	See response to question 8.2 at appendix 1. The decision around the ability to cohort patients in multi-bedded rooms (i.e. having a multi-bedded room with balanced or negative pressure as opposed to positive pressure) was a hospital wide strategy that was determined in consultation with the Clinical Management Team, IPC and the relevant clinical service leads, including Critical Care, with relevant risk assessments having been undertaken. NHSL were responsible for operational functionality only. NHSL were not advised by either MML, IHSL or TUV SUD that balanced or

PROVISIONAL CONCLUSIONS		
		negative pressure for multi-bed rooms in Critical Care was non-compliant with SHTM 03-01.
7.8	The NHSL Programme Board, Mott MacDonald, Multiplex and TUV SUD were presented with the exact ventilation parameters provided in the EM for Critical Care areas on numerous occasions, during the review of the EM, when considering the risks of the ventilation design for multi-bed rooms and when negotiating design solutions. They would have had the opportunity to consider the impact of these parameters for Critical Care areas specifically. Despite this, the discrepancy with air change rates was not identified.	The EM is 2350 line document with 25 columns giving 58750 individual entries in addition to the room function reference sheet and the comments and notes. With the benefit of hindsight, when one knows exactly where to look for the error, it can be identified. It is extremely unfortunate that it was not identified by any party when reviewing the EM. Given the NPD style contract and transfer of design risk to IHSL, other than in respect of operational functionality, there was no contractual requirement on NHSL to undertake a line by line analysis of the EM and so it was unlikely that they would have picked up an error unless it was flagged to them by IHSL or MML.
7.13	The Inquiry team has not seen any evidence that the Infection Prevention and Control Team or the clinical team/service lead for Critical Care areas were consulted on the multi-bed or single bed ventilation issues during the construction phase. This would have been an appropriate thing to do when it became clear that SHTM 03-01 did not unambiguously define recommended conditions for multi-bed rooms.	This is incorrect. In relation to multi-bed rooms, IPC and Critical Care service leads were consulted in relation to cohorting of patients in multi-bed rooms in Critical Care and the need to have balanced / negative pressure. See response to question 8.2. In relation to single rooms in Critical Care, there was no consultation with IPC and Critical Care service leads because NHSL did not consider that the 6ACH to 4ACH derogation was applicable to single rooms in Critical Care.
7.15	During the time that NHSL experienced and expressed concerns around potential non-	NHSL have reviewed emails and relevant diary entries for around this time and cannot identify if anyone from NHSL was present or if NHSL

PROVISIONAL CONCLUSIONS		
	compliance of ventilation, NHS Greater Glasgow & Clyde (NHS GGC) and Health Facilities Scotland (HFS) were aware of issues with ventilation at the QEUH. Lessons learned, some of which related to ventilation, were in development from September 2018	received a copy of this presentation. SHI to confirm who this presentation was for and if it was shared out with HFS/NHS GGC.
7.16	This is because components of the ventilation system were purchased and installed in order to progress with building the hospital according to the project programme.	IHSL is best placed to answer when the components of the building system were purchased and installed.
7.17	Instead of quickly finalising the design, the RDD review process revealed further issues with the EM which turned into a protracted disagreement about how to interpret the Board's Construction Requirements and SHTM 03-01.	The Board were clear that the reference design had no relevance to the contract; that IHSL had to comply with the Project Agreement, in particular the BCRs and PCPs; that it was for IHSL to provide a building which complied with SHTM 03-01; and, that any non-compliances had to be flagged to the Board. However, either IHSL did not appreciate the full extent of their design responsibilities and obligations under the contract and/or, in line with evidence already heard from TUV SUD, considered that they were delivering a compliant facility, in which case the RDD review process would never pick up an error they did not consider existed. Suggest the following: Instead of IHSL ~~quickly~~ developing and finalising its ~~the~~ design through the RDD review process, it revealed further issues with the EM which turned into a protracted disagreement about how to interpret the Board's Construction Requirements and SHTM 03-01.

Appendix 3

Factual inaccuracies contained within PPP8 (the table is non-exhaustive)

	Section	NHSL Response
2.8	The Inquiry has reviewed evidence confirming that the agreed trackers were maintained during the construction phase. The Inquiry has not been provided with minutes of the meetings held to agree comments on RDD items	The trackers were maintained by MML. There were no minutes of the RDD meetings. The meetings were documented by annotating the decisions/actions on the drawings.
4.7 & 4.15.7	Re Level A or Level B approval of RDD items.	NHSL approval was only in relation to Operational Functionality. Approved RDD items shall "be deemed to have satisfied the requirements of the Board in the manner and to the extent set out in Table A in Appendix 1 of Schedule Part 8 (Review Procedure) ("Table A"). This Table A specifically states that in relation to each Approved RDD Item, such item has satisfied Operational Functionality.
4.15.4	Information that could have helped alert reviewers to the discrepancy in the EM was removed, or not considered:	Suggest: Information that could have helped alert reviewers to the discrepancy in the EM was removed by IHSL without flagging the change to NHSL or not considered:
6.2	The settlement agreement provided for 4ac/hr with a balanced pressure regime for single and multi-bed rooms in the Critical Care Department.	Incorrect. See response to question 8.5.
6.3	This agreement appears to have been reached on the basis of Project Co Changes	Incorrect. See response to question 8.

	Section	NHSL Response
	that were submitted by IHSL to NHSL.	
6.4.1	The derogation did not detail the solution for single bedrooms designed with 4ac/h supply and no access to natural ventilation.	Correct – which supports NHSL position that it did not intend to (and, arguably, did not) agree a derogation from the SHTM 03-01 in relation to single rooms in Critical Care in terms of item 13 of SA1.
6.4.2	The Inquiry has been unable to locate any risk assessment in relation to the air change rates specified in the derogation above.	See response to 8.5 in appendix 1.
6.5	After handover, and in light of issues arising at the QEUH, members of IPCT expressed their concern regarding the level of IPCT involvement in the project.	NHSL followed the process for validation and HAI SCRIBE – see NHSL's Response to PPP6. Validation was undertaken after the building work was finalised and before patient occupation when there was a clean environment. Accordingly, suggest deletion of reference to QEUH: After handover~~, and in light of issues arising at the QEUH~~, members of IPCT expressed their concern regarding the level of IPCT involvement in the project and the validation process to date, but were reassured that an independent validation process would take place prior to patient occupation.
9.2.3	1:50 floor plans	1:50 floor plans contain no MEP info other than outlet locations.
9.4.9/10	Medical Location column removed	Medical Location and Risk Profile are to allow designers to determine level and type of electrical resilience.

	Section	NHSL Response
9.4.11 & 12	Risk Profile document	The Risk Profile document relates to electrical design. It is not relevant to ventilation.
9.6.18	The Inquiry has been unable to confirm whether a ventilation workshop was held on 16 January 2017.	The workshop was held on 23 January 2017. NHSL does not hold the minutes of the meeting.
9.6.22	23 January and 6 February 2016.	23 January and 6 February ~~2016~~ 2017
9.6.38	Meeting on 23 February 2017	Ronnie Henderson also attended the meeting on 23 February 2017.
9.7.31	Re the Compromises Schedule	This document discusses air change rates for single rooms with en suites. See response to 8.5 at appendix 1.
9.7.32	The Critical Care team was not listed as consulted.	That is because the compromises being discussed did not relate to Critical Care.
9.10.14 & 15	Re Post-operative care beds	See response to question 8.11
9.10.30		Name: Ian Tinniswood (MML)
9.10.41	Lessons Learned were compiled in a Power Point presentation by HFS	NHSL has asked SHI to clarify if HFS shared the Power Point presentation externally. NHSL have been unable to find a copy and do not recall it being shared or presented.
9.10.47	Project co Change 51 did not detail the solution in single rooms designed with 4ac/h supply and no access to an openable window, such as Critical Care.	This supports that Project co Change 51 and item 13 of SA1 did not apply to single rooms in Critical Care, which did not have natural ventilation or en suites.
9.12.8 & 9.12.9	Re item 13 of SA1 and Project Co Change 051. The change was applied in Critical Care areas and Neutropenic patient areas for which SHTM 03-01	See response to 8.5. Item 13 of SA1 and Project Co Change 051 did not apply to single rooms in Critical Care or haemato-oncology/neutropenic patient areas. There was no derogation re single rooms in Critical

	Section	NHSL Response
	recommended 10ac/h mechanical ventilation.	Care. Item 4 of SA1 dealt with neutropenic patient areas.
9.13.8	The Inquiry team have not seen the 'sample attached'. The only risk assessment circulated as part of this email chain appears to have been the risk assessment carried out for the pressure regime in multi-bed rooms, which does not address the reduced air change rates.	That is correct. There was a risk assessment for multi-bedded rooms (as per the sample attached) but no formal risk assessment for the air change rate in single rooms. See response to question 8.2 and 8.5.
9.13.11	On 1 June 2019, the HAI Scribe Stage 4 checklists were completed.	Incorrect. HAI SCRIBES were not completed/ signed off prior to the delay in opening.
9.13.13	The Inquiry Team understands the asterisk to indicate that the 'risk assessed and approved' derogation to air change rates applied specifically to the Haematology/Oncology ward, Paediatric Critical Care and DCN Acute Care.	This is an incorrect assumption. The evidence of those undertaking the HAI Scribe at the time is that they did not consider that the derogation to air change rates for single rooms from 6ac/hr to 4ac/hr applied to Critical Care. They did not know that IHSL had (incorrectly) designed and installed single rooms in Critical Care with 4 ac/hr at that point in time.

Scottish Hospitals Inquiry

Response by National Services Scotland to
Provisional Position Paper 8

1. In this Response, National Services Scotland ("NSS") provides comments on Provisional Position Paper 8 ('How the potential issue in the Critical Care department of the Royal Hospital for Children and Young People and the Department of Clinical Neurosciences could have been detected during the Construction Phase').

2. In the Glossary there is a reference to Scottish Health Building Notes. In fact, there are no Scottish Health Building Notes. There are UK-wide Health Building Notes.

3. Para. 1.7 notes that Table A1 of SHTM 03-01 Part A "covers all the key parameters of the ventilation system." However, it should be read together with the rest of SHTM 03-01, including its references to other applicable guidance and standards such as HBNs, SHPNs, and statutory requirements.

4. Para. 2.5 lists Patrick Macaulay as an "NHSL Advisor" in the "Equipment" department. At the relevant time, Mr Macaulay was an NSS employee.

5. Para. 4.20 invites views on the appropriateness of using RDD to finalise the design of critical ventilation systems in various circumstances. NSS would not typically recommend the use of the RDD process on any critical building systems or components that could have a significant impact on time, cost, or quality (including health and safety). Critical ventilation systems could have such an impact, for example on hierarchy of cleanliness, spatial co-ordination, infection prevention and control measures, pressure regimes, and building size and form. From a good practice point of view, these systems should always be designed to a substantially complete level prior to the end of Stage 4.

6. With regards to question 8.1, subject to the matters covered in this Response and noting that NSS had no involvement in many of the matters covered, to the best of NSS's knowledge the findings are correct.

7. With regards to question 8.12, reference is made to NSS's comments on para. 4.20 above.

8. NSS will be happy to provide further input and clarification as required.

National Services Scotland

6 October 2023

RESPONSE BY MOTT MACDONALD LIMITED

to

SCOTTISH HOSPITALS INQUIRY PROVISIONAL POSITION PAPER 8 – How the potential issue in the Critical Care department of the Royal Hospital for Children and Young People and the Department of Clinical Neurosciences could have been detected during the Construction Phase

PART 1

1. In part 1 of this paper Mott MacDonald Limited ("MML") seeks to respond to chapters 3 and 9 of PPP8. MML responds more fully to PPP8 in Part 2 of this paper.

Settlement Agreement

2. The section of PPP8 setting out the "Purpose of the Paper" highlights, under reference to section 2 of the Inquiries Act 2005, that the issue of any liability arising under the Project Agreement is not a question for the Inquiry to rule on or determine. MML would suggest that this observation applies equally in relation to the Settlement Agreement. It is possible that the correct interpretation of the Settlement Agreement is controversial. In particular, the statement at paragraph 9.12.8 that the Settlement Agreement "relieved Project Co of its obligation to comply with the SHTM recommendation for single room air change rates" is not accepted by MML as being an accurate statement concerning the effect of the Settlement Agreement. MML recognises that PPP8 and MML's response to it are perhaps not the most appropriate forum in which to address the correct interpretation of the Settlement Agreement. It is perhaps sufficient for present purposes for MML to highlight that it does not accept paragraph 9.12.8 as containing an accurate statement regarding the effect of the Settlement Agreement.

RESPONSE BY MOTT MACDONALD LIMITED

to

SCOTTISH HOSPITALS INQUIRY PROVISIONAL POSITION PAPER 8 – How the potential issue in the Critical Care department of the Royal Hospital for Children and Young People and the Department of Clinical Neurosciences could have been detected during the Construction Phase

PART 2

1. In this paper Mott MacDonald Limited ("MML") seeks to respond to the various invitations made of CPs in PPP8 and to identify some potential inaccuracies or misunderstandings in PPP8.

2. MML notes that the scope of PPP8 is limited to opportunities to detect the potential issue with ventilation rates in the Critical Care department during the "Construction Phase". It is therefore beyond the remit of PPP8 to comment on (i) how the potential issue arose in the first place; and (ii) any opportunities to detect the potential issue prior to this phase of the project.

3. MML would suggest that it is perhaps slightly misleading to refer to this phase of the project as the "Construction Phase". Although it is true to say that this is the phase during which construction work was undertaken on site, it must be borne in mind that, as would be expected in the NPD model, IHSL undertook significant design work during this phase.

4. MML notes the definition of "missed opportunity" set out at paragraph 1.15. The focus is on occasions where there was "potential" to produce a more favourable outcome: where the potential issue "conceivably could or should have" been detected. MML notes that this is a wide definition. MML does not understand the purpose of PPP8 to be to identify particular occasions where any party "should" have identified the potential issue.

5. PPP8 does not focus on the contractual obligations under which the various parties were acting. Nor does it consider the reasonable practicability of the potential issue with ventilation rates being identified by a party reviewing the EM. For the avoidance of doubt, MML's position on these matters is set out in its Closing Statement following the evidential hearings in April/May 2023. In short, MML was not required to, and did not, conduct a line-by-line review of the EM for compliance with SHTM 03-01. Any such exercise would have required a disproportionate duplication of technical expertise at undue cost. It would have been contrary to the NPD model, in terms of which the design risk lay with the private sector.

6. MML notes that in provisional conclusions 7.5, 7.8 and 7.9, NHSL, MML, MPX and TUV SUD are referred to collectively. This may present a misleading impression that each of these parties had similar roles and responsibilities in relation to the content of the EM and its compliance with SHTM 03-01. For the sake of clarity, it may be appropriate to highlight that design responsibility sat with IHSL. IHSL had taken ownership of the EM and was responsible for its contents.

Purpose of RDD Process

7. At paragraph 7.1 it is provisionally concluded that "The purpose of the RDD process is to finalise design elements…" This is incorrect. IHSL has a contractual responsibility to finalise the design. The purpose of the RDD process is to give NHSL the opportunity to comment and sign off on operational functionality of that finalised design.

8. At paragraph 4.4 it is suggested that the RDD process involves "approval of the final design". Again, this is incorrect. Design approval by NHSL through the RDD process is limited to operational functionality. Design responsibility (with the exception of operational functionality) rested throughout with IHSL.

Review of EM by MML

9. At paragraph 7.2 it is provisionally concluded that "The RDD process involved a thorough review of the Environmental Matrix. Mott MacDonald on behalf of the Board provided detailed comments…" The suggestion that MML conducted a "thorough" review of the EM is potentially misleading. As noted above, MML was not required to, and did not, conduct a line-by-line review of the EM for compliance with SHTM 03-01. Although comments were produced, these were not the product of a comprehensive review of every single entry in the EM. When the comments were provided to IHSL, the correspondence would remind IHSL about its contractual responsibilities, including its obligation to comply with the Board's Construction Requirements ("BCRs") (see for example paragraphs 9.4.15, 9.6.5, 9.7.8 and 9.7.28).

10. The statement in paragraph 7.2 that "Mott MacDonald on behalf of the Board provided detailed comments…" is echoed at paragraph 4.12. Paragraph 4.12 sets out the Inquiry team's understanding in relation to reviews of the EM during the RDD process. This understanding is not entirely accurate. RDD submissions by IHSL would be received by MML's project management team. They would then be disseminated to all stakeholders, including those within NHSL. The consolidated comments of all stakeholders, not just MML, would then be fed back to IHSL. Accordingly, although MML would manage the process and provide its own comments following its own spot checks, MML was not the only party conducting a review for the purposes of the RDD process.

Alteration to Guidance Note 15

11. At paragraph 7.3 it is provisionally concluded that "Potentially important information about rooms in Critical Care was also removed." MML would suggest that the most significant change to the EM was not the removal of important information about rooms in Critical Care, but rather the addition by IHSL of qualifying words to Guidance Note 15 (as set out at paragraph 9.3.3).

12. This change to Guidance Note 15 is referred to at paragraph 4.15.4, which states that this change was "not identified by NHSL or MM". Although that is factually correct, section 4.15 of PPP8 does not identify two important missed opportunities related to this change. In the first place, the precise ventilation requirements for Critical Care were plainly being considered by IHSL and/or TUV SUD at the time this change was made. This makes clear that IHSL did not regard the EM as a document it was obliged to comply with; the insertion of the qualifying words represented a major change which was directly related to the proper interpretation of the Guidance. In any event, the consideration given to Guidance Note 15 by IHSL and/or TUV SUD clearly represented an opportunity to identify the potential issue. Secondly, IHSL and/or TUV SUD did not highlight this change. The lack of any highlighting is surprising. Other changes made in that revision of the EM were highlighted in red. For example, changes made to Guidance Notes 19, 21, 24 and 26 were all clearly highlighted in red. This highlighting made the changes readily apparent. In the absence of any such highlighting of the change to Guidance Note 15, there was no reason for MML or NHSL to suppose that any change had been made. The change would only have been detectable had NHSL or MML carried out a line by line comparison of this version of the EM against previous versions. Given that NHSL and MML would have had a reasonable expectation that all changes had been highlighted, there would have been no reason for such a line by line comparison to have been conducted. The lack of any highlighting of this one change is particularly surprising given the significance of this change (which involved changing the Guidance Note from being compliant with SHTM 03-01 to being non-compliant). Had the change been highlighted, it would have provided an opportunity for NHSL and MML to consider the issue further. The lack of highlighting represents a significant missed opportunity. Although NHSL and MML did not identify that the change had been made (which represents a missed opportunity in accordance with the wide definition used in PPP8), it is unreasonable to have expected either NHSL or MML to have picked up this change in absence of any highlighting.

13. Paragraph 4.15.4 goes on to state that "NHSL/MM did not identify from Guidance Note 15 that HDU rooms in Critical Care required 10ac/h, despite referring to the Guidance

Notes for design detail." It is not clear to MML what this statement means. It is not immediately apparent that the paragraphs referred to in footnote 9 support the statement.

14. Paragraph 4.15.4 concludes by making reference to the deletion of the "medical location group" column. For the sake of clarity, it should perhaps be made clear that this deletion was made by IHSL and/or TUV SUD as part of their development of the EM having taken ownership of it.

15. MML is concerned that the tenor of paragraph 4.15.4 is directed at NHSL and MML's failure to notice changes to the EM made by IHSL and/or TUV SUD, rather than on IHSL and/or TUV SUD's conduct in making the changes in the first place and failing to highlight them.

RDD Process – Agreed Schedule

16. Paragraph 4.5 makes reference to the agreed schedule for submission of design proposals by IHSL. It is important to note that IHSL failed to adhere to this schedule. This led to the review team being periodically swamped with material and made the process of reviewing the material more difficult. MML suggests that IHSL's failure to adhere to the agreed schedule for submission of design proposals represented a missed opportunity: had the design proposals been submitted in an orderly fashion in accordance with the agreed schedule, the review process would have been easier. Although it remains unlikely that MML would have identified the potential issue with the ventilation design in such a scenario (given the limited nature of the reviews being undertaken) it is at least conceivable that there would have been a different outcome.

Line-by-line Review of EM

17. Paragraph 4.15.6 suggests that there was a "missed opportunity" as a result of MML declining TUV SUD's suggestion of a final line-by-line review. The wording of paragraph 4.15.6 is a slight gloss on the terms of the source document (which is set out in full at

paragraph 9.8.4). MML confirmed that there was "no requirement" for a line-by-line check. MML's rationale for making this observation was entirely reasonable: if a line-by-line check had already been conducted by TUV SUD, the party responsible for undertaking IHSL's mechanical and electrical design work, there was no need for another one.

18. However, the fact that TUV SUD had conducted a line-by-line review (rather than the hypothetical possibility of another one being conducted) was plainly an important missed opportunity. Indeed, it was perhaps the best opportunity that any party had after financial close to identify the potential issue. It is accordingly suggested that the line-by-line review that was actually conducted by TUV SUD should be characterised in PPP8 as a missed opportunity.

Level B Status of EM

19. Paragraph 4.15.7 makes reference to NHSL approving the EM at "level B" status on two occasions. It is unclear how that approval of itself amounts to a missed opportunity. In any event, such an approval "shall not otherwise relieve Project Co of its obligations under this Agreement nor is it an acknowledgement by the Board that Project Co has complied with such obligations" (paragraph 4.5 of Schedule Part 8 of the Project Agreement). Such obligations would include compliance with the BCRs. It was IHSL's responsibility alone to ensure that the comments made as part of the level B approval were actioned.

20. Following the decision to give the EM level B status in April 2016, the covering correspondence (quoted at paragraph 9.4.15) stated "IHSL are also reminded that the reference design has no relevance to the current contract, and IHSL are to comply with the Project Agreement and in particular the BCR's and PCP's. Any non-compliance with the BCR's or PCP's should be highlighted to the Board." Similar caveats were included in correspondence in November 2016 (see paragraph 9.6.8).

Appropriateness of RDD Process

21. At paragraphs 4.20 and 8.12, CPs are invited to comment on the appropriateness of the RDD process. MML's position is that the RDD process is appropriate provided that parties understand their contractual roles and responsibilities and follow the process correctly. The RDD process is a feature of the NPD contract. It is the only contractual mechanism for dealing with design issues that have not been finalised at Financial Close. Given the pressures to reach Financial Close that were discussed at the hearing in April/May 2023, there was no reasonable alternative but to proceed by way of the RDD process. Assuming that the contractor complies with its obligations under the contract (including the requirement to comply with the BCRs and the need to adhere to the agreed schedule), the RDD process ought to be a suitable way to approach matters. The issue in the present case was not with the RDD process itself, but rather in IHSL's failure to adhere to its responsibilities in relation to that process, despite numerous reminders.

Appropriateness of Audit by Another Engineer

22. At paragraph 4.23, CPs are invited to comment on whether a separate audit by another engineer was necessary, appropriate or proportionate. It is unclear at what stage the Inquiry envisages that such an audit would take place. The paragraph refers to assurances given by H&K at the reference design stage, but PPP8 is concerned with missed opportunities at a much later stage in the project once construction had commenced. It is also unclear what the Inquiry envisages in terms of whose responsibility it would be to instruct such an independent audit. Given that the NPD model involves transferring design risk (with the exception of operational functionality) to the design and build contractor, any requirement to engage an independent engineer to audit the design ought to rest with the design and build contractor. In any event, MML considers that it ought not have been necessary, appropriate or proportionate for another engineer to conduct a separate audit of the design. Such an exercise would have added considerable cost to the project and potentially caused further delay. An expert designer, in the form of H&K, had been instructed at reference design stage. After its appointment, IHSL took ownership of the design and ought to have

developed and reviewed it to ensure it complied with the SHTM 03-01. Had IHSL complied with its obligations under the Project Agreement and produced a design that complied with SHTM 03-01, the engagement of an independent engineer would not have added any value.

Assurance from MML

23. Paragraph 4.23 refers to "assurances NHSL had received from MM and H&K". MML is unclear what assurances are being referred to in this passage. This may have been intended to be a reference back to paragraph 4.21 in which it is stated that "MM sought and received assurances from… H&K". This is an accurate statement of the position regarding assurances provided to NHSL. MML suggests that 4.23 is amended to delete the words "MM and".

Review of Ventilation Design in CC Multi-Bed Rooms

24. Paragraph 5.6 states that "The ventilation design in the Critical Care multi-bed rooms was considered in detail." This statement gives the misleading impression that there was a general review of all aspects of the ventilation design for Critical Care multi-bed rooms. The reviews were concerned with the specific derogation request and the issue of the appropriate pressure regime.

MML Reviewing Guidance

25. Paragraph 5.11 refers to MML and others continuing to review recommendations contained within guidance, including SHTM 03-01, and reaching different interpretations. It is not clear to MML what this statement means. It is not immediately apparent that the paragraphs referred to in footnote 32 support the statement.

Settlement Agreement

26. The section of PPP8 setting out the "Purpose of the Paper" highlights, under reference to section 2 of the Inquiries Act 2005, that the issue of any liability arising under the Project Agreement is not a question for the Inquiry to rule on or determine. MML would suggest that this observation applies equally in relation to the Settlement Agreement. It is possible that the correct interpretation of the Settlement Agreement is controversial. In particular, the statement at paragraph 6.2 that "the settlement agreement provided for 4ac/hr with a balanced pressure regime for single and multi-bed rooms in the Critical Care Department" and the discussion in paragraphs 6.3 and 6.4 are not accepted by MML as being accurate statements concerning the effect of the Settlement Agreement. MML recognises that PPP8 and MML's response to it are perhaps not the most appropriate forum in which to address the correct interpretation of the Settlement Agreement. It is perhaps sufficient for present purposes for MML to highlight that it does not accept paragraphs 6.2, 6.3 and 6.4 as containing accurate statements regarding the effect of the Settlement Agreement. The same observation applies in relation to similar statements made in section 9.12 and the question posed at paragraph 8.7.

Misunderstanding of SHTM 03-01

27. At paragraph 7.10 it is provisionally concluded that MML, amongst others, "showed a misunderstanding of the ventilation recommendations for Critical Care areas contained in SHTM 03-01." MML is unclear what misunderstanding is being referred to in this paragraph. MML does not accept that it showed any misunderstanding of the ventilation requirements for Critical Care areas contained in SHTM 03-01.

Opportunities to Detect Issue Sooner

28. At section 7 CPs are invited to provide views on how the Critical Care ventilation issue could have been detected sooner.

29. MML would suggest that the clearest opportunities to detect the issue sooner lay with H&K at the time it prepared the initial EM and, more importantly, IHSL once it took ownership of the EM and developed its design. However, it is recognised that these matters perhaps fall outwith the scope of PPP8.

30. Paragraph 7.11 makes reference to advice provided by independent experts. MML notes that none of these experts identified the potential issue with the ventilation rates in Critical Care. It is suggested that this was a missed opportunity.

31. MML also suggests that a further opportunity arose in light of the Board's comments on revision 11 of the EM. These comments were circulated by email from Kamil Kolodziejczyk of MML dated 17 November 2017. In the sheet headed "All Rooms" a comment had been added by Ross Southwell on line 223 in respect of Room No. 1-B1-063 (a four-bed room in Critical Care). In relation to the Supply and Extract cells, Mr Southwell commented "Please confirm ventilation rates". This comment provided an opportunity for IHSL to consider and confirm that the ventilation rates for this room were correct. MML has been unable to locate any response to this comment by IHSL.

32. In some of the preceding paragraphs, MML has identified other potential missed opportunities:

    32.1. The consideration given by IHSL and/or TUV SUD to Guidance Note 15 which led to the change referred to at paragraph 4.15.4.
    32.2. The failure by IHSL and/or TUV SUD to highlight the change made to Guidance Note 15 referred to at paragraph 4.15.4.
    32.3. The submission by IHSL of design proposals in an orderly fashion in accordance with the agreed schedule for the RDD process.
    32.4. The line-by-line review of the EM actually conducted by TUV SUD.

Communication of Changes to the EM

33. At paragraph 8.9 CPs are invited to comment on whether changes made to the EM were being communicated and actioned appropriately. Changes to the EM were not communicated appropriately. In particular, the change made to Guidance Note 15 (discussed above), despite being of fundamental importance was not highlighted to MML or NHSL by IHSL, notwithstanding other changes having been highlighted by them.

Detection of Issues through the RDD Process

34. At paragraph 8.10 CPs are invited to comment on why the RDD process did not detect the specific requirements for air change rates and pressure regime in Critical Care. Insofar as the RDD process ought to have involved the production of a final EM by IHSL that was fully compliant with the BCRs, the process ought to have resulted in the ventilation issues being addressed. However, the process of review and approval conducted by MML and NHSL as part of the RDD process was not at the level of detail that would have been expected to identify issues of this type. The reviews conducted were to ensure operational functionality and any approvals given were necessarily limited to that basis in accordance with the provisions of the Project Agreement. If any issues going beyond operational functionality (such as non-compliances with SHTM 03-01) happened to be identified during these reviews, they would be highlighted to IHSL. However, the reviews conducted by MML were never intended to be, and were not, detailed line-by-line reviews designed to ensure that the entirety of the EM was in compliance with SHTM 03-01. Design responsibility (with the exception of operational functionality) rested throughout with IHSL. This matter is addressed in more detail in MML's Closing Statement following the evidential hearings in April/May 2023.

Other Matters

35. Based on its current state of knowledge, MML is unable to assist in relation to the various invitations and requests made in PPP8 except insofar as addressed in this response.

1 Introduction

1.1 The following is a response by Multiplex Construction Europe Limited ("**Multiplex**") to Provisional Position Paper 8 titled: *"How the potential issue in the Critical Care department of the Royal Hospital for Children and Young People and the Department of Clinical Neurosciences could have been detected during the Construction Phase"* ("PP8"), issued by the Inquiry by e-mail dated 06 September 2023 (timed at 12.36).

1.2 Multiplex notes the terms of PP8, together with terms of the Inquiry's e-mail issuing them and the Inquiry's email of 27 July 2023 at 08.42, where the Inquiry highlights the importance of Core Participants understanding the factual basis on which the Inquiry is proceeding and having the opportunity to correct any misunderstandings or misapprehensions. Multiplex is grateful for this opportunity to assist the Inquiry.

1.3 As directed Multiplex's response has been prepared in two parts. This part responds to chapters 1, 2 and 4 to 8 of PP8. Multiplex has then produced a separate response addressing the PP8 Chronology of the Reviewable Design Data ("RDD") process published on the Inquiry website on 08 September 2023, which includes Chapters 3 and 9 of PP8, renumbered as Chapters 2 and 3.

1.4 Having regard to Section 2(1) of the Inquiries Act 2005, Multiplex's position set out in this response is provided solely to assist the Inquiry's understanding and is without prejudice to and under reservation of any further submissions Multiplex may make or evidence it may lead in any forum.

2 RDD

<u>The purpose of RDD</u>

2.1 Paragraph 1.1. of PP8 states:

> *"At the conclusion of the Project Agreement, and with the arrival of the contractor Multiplex (MPX) on site on 16 February 2015, the RHCYP/DCN reprovision project entered the construction phase with a proportion of the design still to be agreed, including some of the room environmental conditions contained in the Environmental Matrix."*

2.2 At paragraph 8.10 of PP8 the Inquiry then poses the following question:

> *"The Inquiry invites views from CPs on why the RDD process did not detect the specific requirements for air change rates and pressure regime in Critical Care areas".*

2.3 At the outset Multiplex consider it is important to understand that the purpose of the RDD process is to complete the detailed design, based on the Board's Construction Requirements ("BCRs") which were agreed at Financial Close ("FC"). The purpose is not to carry out a re-design of those requirements. This is reflected in the paper produced by NHSL and Mott MacDonald ("MM"), referred to by the Inquiry at paragraph 9.2.3 of PP8, which states:

"The RDD process is the next stage in the design development process following the extensive work that was undertaken between April and July 2014…. It is important to note that the RDD process is to conclude the previous work undertaken and is not an opportunity to re-design the department."

2.4 In response to the question posed at paragraph 8.10 of PP8, Multiplex consider the RDD process did detect the Board's specific requirements for air change rates and pressure regime in Critical Care areas. The detailed ventilation design approved through the RDD process reflected the Board's requirements in the BCRs, including the Environmental Matrix ("EM"), and any requested changes to those requirements. An example of such a change being in relation to the Multi-Bed Wards discussed in Section 6 below.

2.5 As Multiplex has set out in their previous submissions, where the Board's express requirements deviated from SHTM 03-01, these express requirements took precedence. It was these express requirements, rather than SHTM 03-01, against which the design was reviewed during the RDD process.

2.6 That it was NHSL's specific requirements, rather than SHTM 03-01, that provided the basis upon which the design was reviewed can be seen in the comments made by NHSL in February 2017, detailed at paragraph 9.6.37 of PP8:

"I wonder if I could prevail on you to attend a meeting with me/Janice to discuss the ventilation for single rooms within the new haematology/oncology ward in the new building. There would appear to have been a need for contractors ***to deviate from an SHTM in order to achieve the output specification signed off at Financial close****. Just need to make sure before the contractors proceed further that we are all in agreement around any operational issues/ balance of potential risks to patients […] The contractors will give me airflow drawings to share at the meeting so we can be clear on these".*

Together with Mr Currie's comments to Mott MacDonald, detailed at paragraph 9.6.28 of PP8:

"If we have not already stated our requirements (environment matrix etc) we need to do it now"

2.7 Further, as is confirmed by the Construction Phase Execution Plan produced by Mott MacDonald, there was a dedicated Clinical Support workstream responsible for ensuring the design met NHSL's clinical operational needs:

"The NHSL Clinical Management Team is responsible for ensuring that design and planning reflect clinical operational need and best practice. They must ensure that an efficient, practical, functional facility is achieved through the construction phase".

2.8 NHSL and their advisers did not state a requirement in either the BCRs or during the RDD process for 10 AC in critical care, instead they stated (and confirmed during the RDD process) that their specific requirement was 4AC.

<u>The RDD Process</u>

2.9 Paragraph 2.8 of PP8 states:

"The Inquiry has reviewed evidence confirming that the agreed trackers were maintained during the construction phase. The Inquiry has not been provided with minutes of the meetings held to agree comments on RDD items."

2.10 The documents submitted for RDD were typically hand marked in the meetings with comments from the Board and their advisors. Following revisions of the document would then record the comments and provide a response. See for example the below extract from drawing WW-Z4-01-PL-524-001 Rev J (Appendix 3).

ITEM	COMMENT	RESPONSE
1.	NO VENTILATION	VENTILATION ADDED TO ROOMS NOTED
2.	DIFFUSERS NOT SHOWN. DETAIL DIFFUSER TYPE.	DIFFUSERS ADDED. REFER TO SCHEDULES FOR DIFFUSER DETAILS
3.	CONFIRM OF LOBBY VENTILATION SYSTEM	BED LIFT LOBBY OMITTED. REFER TO DRAWING WW-SZ-PL-524-001 FOR DETAILS.

* COMMENTS BASED ON WW-Z4-01-PL-524-001 Rev E - STATUS C.

2.11 The seventh bullet point of paragraph 4.17 of PP8 then states:

> *"No robust procedures were in place to keep track of the large number of issues identified during the review procedure"*

2.12 The RDD process was tracked and managed through the RDD tracker. See for example Rev 19 dated 6 December 2018 (Appendix 1), which on tab J4 records the date each drawing was submitted to NHSL; the relevant Aconex transmittal submitting it; the date it was returned by NHSL; the status provided and the date any comments were returned to the design consultants, again with the relevant Aconex transmittal.

2.13 The status of RDD was then reported on each week, with the RDD tracker being regularly issued to MM for review (see for example Appendix 2).

<u>The effect of the RDD process</u>

2.14 Paragraph 4.7 of PP8 states:

> *"In accordance with the Review Procedure any "Level A" or "Level B" approval which entitled IHSL to commence construction (subject to any comments from NHSL) did not relieve IHSL of compliance with its other obligations under the Project Agreement."*

2.15 As Multiplex explained in their November 2021 submission, the Level A or B approval not only entitled IHSL/Multiplex to commence construction but placed a positive obligation on them to proceed in accordance with the approved item.

2.16 Paragraph 4 of Schedule Part 8 sets out the effect of the review, with paragraph 4.1 stating (our emphasis):

> *"Any Submitted Item which is returned or deemed to have been returned by the Board's Representative endorsed "no comment" (and in the case of Reviewable Design Data, endorsed "Level A - no comment")* ***shall be complied with or implemented (as the case may be) by Project Co"***

2.17 With paragraph 4.3.1 then stating that (again our emphasis):

> *"Project Co shall where the Board's Representative has endorsed the Submitted Item "Level B-proceed subject to amendment as noted",* ***either proceed to construct or proceed to the next level of design of the part of the Works to which the Submitted Item relates*** *but take into account any amendments required by the Board's Representative in his comments"*

2.18 Approved items became part of the BCRs and became what IHSL/Multiplex were obliged to build. All the individual parts of the ventilation design were approved as Status A or B, as were the Room Data Sheets and the Environmental Matrix.

Response to NHSL Comments

2.19 The third bullet point in Paragraph 4.17 states:

> *"Project Co did not investigate the potential scale of inconsistencies and made changes to the rooms exampled by NHSL only."*

2.20 NHSL, as the clinical operators of the hospital, are best placed to know what each room/space requires. The RDD process required IHSL to respond to the comments made by the Board on each specific item. This is what was done.

2.21 The fourth bullet point in Paragraph 4.17 states:

> *"Project Co actioned partial corrections, often with long delays between a comment being made and changes appearing in the EM."*

2.22 It is important to understand that the Environmental Matrix (like the Room Data Sheets) is a summary document. The detail of the ventilation design is contained in the drawings and grille schedules which were likewise being reviewed and approved through the RDD process. Taking Critical Care department B1 as an example, as was explained in Multiplex's Response to Provisional Paper 6 ("PP6"):

2.22.1 The ventilation design drawing which covers this area is drawing WW-04-01-PL-524-001 titled Zone Z4 Level 01 Ventilation Distribution Sheet 1 of 2 (Appendix 3). This design was reviewed and approved at various stages through RDD by NHSL with Rev J being approved as status B by Brian Currie of NHSL on 03 May 2018.

2.22.2 This drawing details duct routes, duct ancillaries, duct sizes and contains the grille references.

2.22.3 The ventilation flow rates to be achieved at each grille shown on the ventilation design drawing are then further detailed on the associated grille schedules. Again, these were reviewed and approved by NHSL at various stages. For critical care these are:

(1) **WW-Z4-01-SH-524-001 titled Zone 4-1 Level 01 Schedule of Supply Grilles** (Appendix 4) Rev H was approved as status A by Brian Currie on 23/08/2018.

(2) **WW-Z4-01-SH-524-002 titled Zone 4-1 Level 01 Schedule of Extract Grilles** (Appendix5) Rev I was approved as status A by Brian Currie on 23/08/2018.

(3) **WW-Z4-01-SH-524-003 titled Zone 4-1 Level 01 Schedule of Dirty Extract** (Appendix 6) Rev E was approved as status A by Jackie Sansbury on 02/05/2018.

2.23 Responding to the Board's comments on the EM therefore required consideration (and where necessary) changes to the detailed design and for these to be reviewed and approved through RDD. It is, therefore, potentially misleading to only look at the timing of changes made to the EM, as these changes reflect the output of a much wider process.

2.24 At paragraph 8.9 of PP8 the Inquiry poses the following question:

> *"Views are invited from CPs on whether the changes made to the EM were being communicated and actioned appropriately in the construction of the RHCYP."*

2.25 Throughout the RDD process, MPX sought to engage and work with NHSL in a collaborative manner. Multiplex responded to and addressed all changes communicated to them by NHSL and their advisors. This is confirmed by the fact the design, and EM, was approved through the RDD process and Practical Completion was then certified confirming the works had been designed and constructed in accordance with NHSL's requirements.

Appropriateness of process

2.26 Paragraph 4.20 of PP8 states:

> *"Given the known challenges of RDD, views are invited from CPs on whether it is an appropriate process to finalise the design of critical ventilation systems in clinical areas where:*
>
> *• There may be differing interpretations of guidance*
>
> *• There is a greater clinical risk associated with non-compliant design*
>
> *• Changing one element of the design may have a knock-on effect on other parts of the design (e.g. changing a pressure regime may require a change to other specifications which have already been agreed)*
>
> *• The construction materials (such as ductwork and air handling units) are based on the specified design"*

2.27 Likewise at paragraph 8.12 of PP8 the Inquiry asks the following question:

> *"Given the apparent challenges of the RDD process, is it an appropriate process to finalise the design of critical ventilation systems in clinical areas?*
>
> - *If yes, why? Is there anything that could be done to improve it in future?*
> - *If no, why? What alternative could be adopted in future?"*

2.28 Multiplex consider the answer to this question rests in understanding the purpose and aim of RDD. Reference is made to paragraph 2.1 – 2.8 above; the RDD process was a process through which the detailed design was developed and approved, based on the brief provided by the Health Board. Multiplex consider that the RDD process is an appropriate and recognised process for this. It allows the Health Board, and their technical advisors, to be actively involved in the design process and ensures they review, approve and understand all elements of the design, to ensure their specific requirements are being met. This collaborative approach is necessary given the health board, and their clinicians, are the party who best understand the clinical requirements of each area. As noted at paragraph 2.14 - 2.18 above, once approved through the RDD process the design then became what IHSL/Multiplex were obliged to build.

3 Position at Financial Close

The Environmental Matrix

3.1 Paragraph 4.9 of PP8 states:

> *"The Environmental Matrix was not approved at Financial Close. It was included in Part 4 of Schedule Part 6 to the Project Agreement (Section 5, Reviewable Design Data, "the RDD schedule") along with Board comments. Amongst the Board comments was a request for a "detailed proposal… on bedroom ventilation to achieve balanced/negative pressure relative to the corridor".*

3.2 As the Inquiry have recognised elsewhere, the status of the EM at FC has become a contentious point in these proceedings (it not being a contentious matter at FC). This was explored in the April 2023 hearings and Multiplex has already provided detailed submissions setting out its position, that only 7 points were identified at the meeting with NHSL on 11 November 2015 and were included in Section 5 of Schedule Part 6 of the Project Agreement.

3.3 One of those 7 comments stated:

> *"Detailed proposal awaited on bedroom ventilation to achieve balanced/negative pressure relative to corridor".*

3.4 As was explored in the April 2023 hearings, however, this comment related to the pressure regime in the single bedrooms. Following discussions with the Board, including a specific meeting held on 13 January 2015, NHSL's requirements for the pressure regime in the single bedrooms were confirmed and the positive pressure requirement defined within the Reference Design Environmental Matrix was changed to a balanced pressure regime for the single bedrooms. See Section 5 of Multiplex's Response to Provisional Papers 1 and 2, together with paragraphs 8.10 – 8.16 of Multiplex's submission following the April 2023 hearing.

3.5 No further changes were requested by the Board in relation to the air change regime for the single bedrooms. The Environmental Matrix was accordingly changed, and the EM incorporated in the Project Agreement at FC required 4AC and balanced pressure in the single bedrooms.

3.6 The design parameters for the single bedrooms were accordingly agreed and confirmed prior to Financial Close. The Board's comment at Financial Close relates to the detailed design to achieve these requirements.

3.7 Following Financial Close, on 26 May 2015 Multiplex provided Wallace Whittle's response to the Board's 7 RDD comments on the EM. The Wallace Whittle comment in relation to the Board's comment *"Detailed proposal awaited on bedroom ventilation to achieve balanced/negative pressure relative to corridor*" stated:

> *"The single bedrooms have had their ensuite extract increased to achieve a balance within the room, this has been noted within the matrix"*

3.8 On 22 July 2015 MM responded stating:

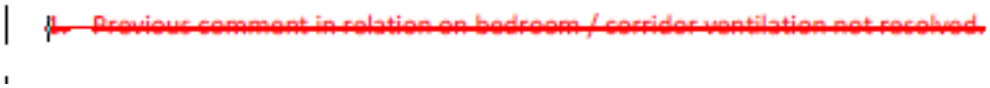
> *"NOTE 26 AND VENTILATION TYPE HAVE NOT BEEN ALTERED"*

3.9 See the email chain provided as Appendix 7.

3.10 MM's comment was addressed in Revision 2 of the EM submitted for formal RDD. Note 26 being a reference to the Guidance Notes at the start of the matrix in relation to "Single Bedroom", copied below for ease – the text in black shows the original wording and black underlined text showing the change to take account of MM comment above:

> ***Single Bedroom -*** *The design philosophy for ventilation is for a mixed mode operation where natural vent is encouraged which has benefits both physiological with users being partly in control, and from an energy stand point where mechanical vent loading is partly reduced (2/3rds). This strategy results in zero pressure differential regime within the room where supply and extract is balanced.*
>
> *En suite dirty extract volume flow rate has been increased to achieve a balanced ventilation system.*

3.11 When the Board issued their official comments on Rev 2 of EM the comment in relation to the provision of the detailed proposal on bedroom ventilation was deleted (see Appendix 8):



Room Data Sheets

3.12 Paragraph 4.11 of PP8 states:

> *"Prior to Financial Close 40% to 50% of Room Data Sheets containing, amongst other things, environmental data for each room in the hospital, had been completed. The remaining 50% to 60% were to be completed after the EM had been finalised through the RDD process."*

3.13 The status of Room Data Sheets ("RDS") at FC was addressed at the April 2023 hearings. Reference is made to paragraphs 9.2 – 9.5 of Multiplex's submissions, which explain that the RDS produced at Financial Close showed 4AC would be provided in Critical Care. Multiplex accordingly does not consider that paragraph PP8 4.11 accurately reflects the whole of the evidence avaliable to the Inquiry in relation to this point.

4 The revisions of the EM post Financial Close

4.1 Paragraph 4.14 of PP8 states:

> *"From 2015 to 2017 the EM was revised a number of times beginning with "revision 2" in November 2015 and ending with "revision 11 version 33" in October 2017"*

4.2 Paragraph 4.16 then states:

> *"The final review of EM Rev 11 in October 2017 concluded its development through the RDD process but did not contain the final agreed specifications for ventilation in multi-bed rooms. Instead, these were contained in a Settlement Agreement. This is discussed in later sections".*

4.3 Multiplex has addressed the multi-bedroom ventilation in Section 6 below. Multiplex do not, however, consider that paragraphs 4.14 and 4.16 are factually accurate. An updated extract of the EM showing the agreed

position in relation to the multi-bed wards was issued to NHSL and MM on 05 July 2018, see Appendix 9 and Appendix 10

5 General ventilation design

En-suite ventilation

5.1 The first bullet point at paragraph 4.15.2 PP8 states:

> "*it took 14 months for Project Co to remove ensuites from all bedrooms and open plan bays in Critical Care areas in the EM"*

5.2 Multiplex do not consider this is factually accurate. As is explained at paragraphs 2.22 above, the EM is a summary document and it is accordingly necessary to also consider the detailed design documents.

5.3 The detailed design for critical care bedrooms and open plan bays did not show en-suites, nor rely on extract from en-suites as part of the ventilation design. The detailed ventilation design always showed supply and extract from the rooms. See the first revision of WW-Z4-01-PL-524-001 Rev 01 dated 01/07/2015 (Appendix 11) together with the final revision produced as Appendix 12.

5.4 The only room showing provision of extract ventilation through the en-suite in the detailed design is room 1-B1-075 which has an en-suite.

5.5 On 11 February 2016 NHSL made the comment that 1-B1-063 (4 bed bay) did not have an en-suite.

5.6 On 10 March 2016 Wallace Whittle responded stating:

> "*Refer to the design drawings for details. Generally, the extract is via the en-suite which is in line with SHPN 04. Where no ensuite is present, extract is via the room."* With the comment *"No action required"*

Natural Ventilation

5.7 The second bullet point at paragraph 4.15.2 PP8 states

> *"it took the same amount of time to remove natural ventilation in seven out of nine Critical Care rooms in the EM"*

5.8 Again, Multiplex does not consider this statement is factually accurate. The detailed design did not change – all revisions showed 4 mechanical air changes for these rooms.

Openable windows

5.9 The Inquiry poses the following question at paragraph 8.8 of PP8:

> *"Despite the removal of natural ventilation from Critical Care rooms in the EM, the Inquiry understands that all nine rooms in Critical Care were ultimately constructed with openable windows and mechanical ventilation specification of 4ac/hr. Why was this?*

5.10 The rooms were constructed with openable windows and 4 mechanical ac/hr as these were NHSL's requirements. In accordance with NHSL's requirements the windows were also lockable, and when locked provided the same seal as if they were non-openable.

5.11 Reference is made to Multiplex's previous submission in relation to NHSL's requirement for 4 mechanical AC in critical care.

5.12 In relation to the requirement for openable windows, reference is made to the External window schedule HLM-SZ-01-SH-321-101 Rev F (Appendix 13), which was approved as RDD status A by the NHSL on 02 December 2016. This details the windows required in each of the 9 rooms in critical care. Type 35, 36 & 39 are detailed as requiring openable windows:

B1-019 No external windows (internal)
B1-020 Openable Type 36
B1-021 Openable Type 36
B1-037 Openable Type 35
B1-075 Openable Type 35
B1-009 Openable Type 39
B1-031 Openable Type 36
B1-063 Openable Type 35
B1-065 Openable Type 35

5.13 Multiplex understand NHSL's choice to have openable windows, which could be locked, included considerations of the benefit to patients, see for example Guidance Note 26 in the Project Agreement EM which stated:

> *"The design philosophy for ventilation is for a mixed mode operation where natural vent is encouraged which has benefits both physiological with users being partly in control, and from an energy stand point where mechanical vent loading is partly reduced (2/3rds).*

Approved Design

5.14 Paragraph 4.15.3 PP8 states:

> *"NHSL and Project Co failed to reach agreement on a design for single bedroom ventilation, and the requirements for multi-bed room ventilation. The attempts to reach agreement on these matters involved considering ventilation parameters in Critical Care areas on a number of occasions. This is discussed in the following section".*

5.15 Likewise, paragraph 5.1 PP8 states:

> *"As noted, during the RDD process NHSL and Project Co struggled to agree on a design for bedroom ventilation generally and the specific requirements for "4 bedded rooms".*

5.16 Multiplex do not consider these paragraphs are factually accurate. Firstly, it was not a question of *"agreeing the design",* it was NHSL to brief their requirements and IHSL to provide a design which met those requirements to allow approval through the RDD process. This was achieved and the ventilation design was approved through RDD, see for example paragraphs 2.22 above in relation to the Critical Care design and Section 6 below in relation to the multi-bedroom ventilation design.

5.17 The disagreement between the parties related not to the technical design requirements, but to contractual liability. The dispute between the parties was, however, resolved in the Settlement Agreement.

6 Multi-bedroom ventilation design

6.1 Paragraph 7.9 states:

> *"The dispute over multi-bed rooms centred on differing interpretations of SHTM 03-01. In attempting to resolve the multi-bed room dispute NHSL, Mott MacDonald, Multiplex and TUV SUD all consulted relevant guidance. This did not identify that a positive pressure regime was in fact recommended in SHTM 03-01 for Critical Care areas."*

6.2 Paragraph 7.10 states:

> *"Instead, in raising concerns about the pressure regime for multi-bed rooms in Critical Care NHSL, Mott MacDonald, Multiplex and TUV SUD all showed a misunderstanding of the ventilation recommendations for Critical Care areas contained in SHTM 03-01."*

6.3 Multiplex do not consider these paragraphs are factually accurate. Again, there was no dispute in relation to the technical design process. As is explained in more detail in Section 6 below NHSL had originally briefed the multi-bedrooms as requiring positive pressure. Following Financial Close NHSL then changed their requirements and sought balanced pressure in the multi-bed wards. IHSL/Multiplex worked with NHSL and Motts to produce a detailed design which achieved this changed requirement, and this was agreed and implemented. The dispute between the parties related to the contractual liability for this; again however, this was resolved in the Settlement Agreement.

6.4 Overall, Multiplex do not consider that PP8 accurately reflects the full evidence avaliable in relation to the multi-bed wards:

6.4.1 The Reference Design EM and EM included in the Project Agreement showed positive pressure in relation to the multi-bedrooms.

6.4.2 In December 2016 and January 2017 in became apparent that the Board wanted to change these requirements and have balanced pressure in the multi-bed wards.

6.4.3 Meetings took place between all parties and Wallace Whittle produced a report entitled "*Bedroom Ventilation Key Considerations"* (Appendix 14) following a meeting on 23 January 2017. This document looked at both the ventilation in the single bedrooms and in the multi-bed wards. In relation to the multi-bedrooms, the report looked at the implications of changing the pressure regime in these rooms to balanced, including the ductwork alterations that would be required.

6.4.4 The report was then discussed at a meeting on Monday 6 February 2017 and on 9 February 2017, Wallace Whittle provided a further report entitled *"Multi Bedroom Ventilation Amendment Proposal to Achieve Room Balance"* (Appendix 15). This document further details a possible design solution to provide balanced pressure in the multi-bed wards on a room-by-room basis. The multi-bed wards in this document include those in Critical Care. The solution for the three multi-bed wards in Critical Care

is stated as reducing the air change rate in these rooms to 3ac/hr, from the 4ac/hr previously required in the Environmental Matrix.

6.4.5 Following further meetings with the Board and MM, on 21 February 2017 Wallace Whittle produced another report entitled *"Accommodation Design Criteria – Single Rooms & Multi Bed Wards"* (Appendix 16)

6.4.6 On 23 February 2017, Wallace Whittle then issued the third revision of their *"General Ward – Ventilation Amendment Proposal"* (Appendix 17). This contained the same proposal to achieve balanced pressure in the multi-bed wards as set out previously in their report of 9 February 2017 but provided more detail on the ductwork changes that would be required. This again includes the proposal to reduce air change rates in the Critical Care multi-bed wards from 4ac/hr to 3ac/hr.

6.4.7 On 24 February 2017, a further meeting was held with the Board. Multiplex provided a note of this meeting on 27 February 2017, which included a marked-up schedule containing all of the multi-bed wards that were being discussed (Appendix 18). Each room has been marked as either "essential" or "non-essential", reflecting the discussions at the meeting where the Board reviewed each of the design solutions to provide balanced pressure in these rooms and decided whether it was essential or not that the changes were made. The outcome of that exercise being that the Board decided that not all 20 multiroom were to be modified, instead only 14 rooms (including those in critical care) were deemed "essential".

6.4.8 On 12 May 2017, Multiplex issued ventilation drawings to IHSL which showed how the change to negative or balanced pressure in the 14 multi-bed wards would be achieved (Appendix 19 and Appendix 20). In this email, Multiplex noted their position that this constituted a change for which the Board were liable.

6.4.9 Whilst the contractual position was disputed, the technical design discussions continued and in April 2018, Wallace Whittle provided a pack of drawings for a *"revised ventilation proposal to achieve a room balance at 4a/c"*. This revised pack reflected the Board's decision that, whilst they wanted balanced pressure, they wanted to maintain 4AC, rather than reduce it to 3AC as per the previous proposal. (Appendix 21)

6.4.10 This revised proposal was discussed at a meeting with the Board on 12 April 2018.

6.4.11 In an email of 18 April 2018, the Board noted that revision 5 of the "*General Ward – Ventilation Amendment Proposal to Achieve Room Balance"* still showed air change rates between 2.7 and 3.5, whereas they were *"seeking a design for 4AC*" for all of the rooms addressed in the schedule – which included those in critical care (Appendix 22)

6.4.12 In response to this email Multiplex responded and confirmed they understood "*4AC is the brief"* and that the Schedule was being updated to reflect the 4ac/hr and balanced pressure requested for these rooms (Appendix 23)

6.4.13 On 22 May 2018, revision 6 of the *"General Ward – Ventilation Amendment Proposal"* was issued for RDD (Appendix 24 –). This was returned with Status B on 31 May 2018 (Appendix 25). This document states that the multi-beds in Critical Care are to have an overall air change rate of 4ac/hr.

6.4.14 Revision 7 of the *"General Ward – Ventilation Amendment Proposal"* was then issued through RDD on 21 June 2019 and given status A by the Board on 27 July 2018 (Appendix 26).

6.4.15 In parallel the ventilation design drawing WW-Z4-01-PL-524-001 was updated to Rev J 01/05/2018 to introduce additional extract vent into B1-008, B1-031, B1-063 & B1-065 to achieve a room balance. This was given status B from NHSL Brian Currie 03/05/2018 (Appendix 3)

6.4.16 As noted at paragraph 4.3 above, on 05 July 2018 an updated extract of the EM was then issued to the Board on 05 July 2018 showing the changed requirements in relation to the Multi-bedrooms.

6.4.17 A draft programme was issued to Mercury on 11 May 2018, showing completion of works required to effect the changed pressure regime by 22 October 2018 (Appendix 27).

6.4.18 The commissioning records for AHU 04-06 (the AHU serving the critical care multi-bedrooms) are dated Supply 30/10/2018 and Extract 24/10/2018.

6.5 Finally, reference is also made to Section 9 of Multiplex's response to PP6 which explains how Item 7 of the Settlement Agreement confirmed NHSL's requirements for all multi-bed wards by reference to the design documents discussed above.

7 Settlement Agreement – Single Bedrooms

Single bedrooms

7.1 Paragraph 6.4 states:

> *"A derogation to relieve Project Co of its obligation to comply with the air change rates recommended for single bedrooms in SHTM 03-01 was accepted in the settlement agreement. This was on the basis that 4ac/h would be supplemented by a natural ventilation supply of 2ac/h through openable windows*"

7.2 Multiplex do not consider this paragraph is factually accurate, reference is made to Section 9 of Multiplex's response to PP6 together with Multiplex's response to Item 2.11 in the November 2021 submission. The design required 4 mechanical air changes, which MPX provided.

8 Provisional Conclusions and Inquiry Questions

8.1 Paragraph 8.1 of PP8 states: "*Do you agree with the provisional findings and conclusions? Where the answer is no, can you please provide an explanation with supporting evidence?"*

8.2 Multiplex has sought to address PP8 as far as possible in the time available and would ask that the Inquiry take account of the position set out in this response and update PP8 accordingly.

8.3 In the time available Multiplex has unfortunately not been able to respond to all points raised by the Inquiry and PP8. Multiplex would be happy to liaise with the Inquiry further with a view to identifying and responding to any remaining points.

8.4 In relation to the specific questions raised by the Inquiry in PP8, at present Multiplex would respond as follows:

8.4.1 The questions posed at paragraph 8.2 – 8.6 and 8.11 appear to be matters better addressed by others.

8.4.2 Reference is made to paragraphs 7.1 and 7.2 above in relation to the question posed by the Inquiry at paragraph 8.7.

8.4.3 Reference is made to paragraphs 5.9- 5.13 above in relation to the question posed by the Inquiry at paragraph 8.8.

8.4.4 Reference is made to paragraphs 2.24 – 2.25 above in relation to the question posed by the Inquiry at paragraph 8.9.

8.4.5 Reference is made to paragraphs 2.1 – 2.8 above in relation to the question posed by the Inquiry at paragraph 8.10.

8.4.6 Reference is made to paragraph 2.28 above in relation to the question posed by the Inquiry at paragraph 8.12.

1 Introduction

1.1 The following is a response by Multiplex Construction Europe Limited ("**Multiplex**") to Provisional Position Paper 8 titled: *"Narrative concerning the Construction Phase of the Royal Hospital for Children and Young People and the Department of Clinical Neurosciences"* ("PP8"), published on the Inquiry website on 08 September 2023.

1.2 Multiplex notes the terms of PP8, with Core Participants being provided with the opportunity to correct any misunderstandings or misapprehensions in PP8. Multiplex is grateful for this opportunity to assist the Inquiry.

1.3 Having regard to Section 2(1) of the Inquiries Act 2005, Multiplex's position set out in this response is provided solely to assist the Inquiry's understanding and is without prejudice to and under reservation of any further submissions Multiplex may make or evidence it may lead in any forum.

1.4 Multiplex has sought to address PP8 as far as possible in the time available and would ask that the Inquiry take account of the position set out in this response and update PP8 accordingly.

1.5 In the time available Multiplex has unfortunately not been able to respond to all points raised by the Inquiry and PP8. Multiplex would be happy to liaise with the Inquiry further with a view to identifying and responding to any remaining points.

2 RDD Process

Critical Care RDD pack

2.1 Paragraph 3.2.7 of PP8 states:

> "*According to the PG RDD Tracker, which recorded the documents submitted for PG RDD review, only production groups 1, 2 and 6 received RDS as part of their RDD pack. The B1 Critical Care user group ('PG10') did not receive RDS for review and comment.*

2.2 Multiplex cannot comment on whether specific NHSL user groups received the RDD pack, but they can confirm that the B1 RDS for PG12, PG13 & PG10, were issued by Multiplex to MM and NHSL on 31 July 2017 (Appendix 1).

2.3 Mott MacDonald ("MM") then returned comments on the RDS for B1 on 30 August 20217 (Appendix 2).

3 EM at Financial Close

Board comments

3.1 At paragraph 3.1.2 of PP8 the Inquiry refer to Board Comments included in the "RDD Schedule". Multiplex consider there is a possibility for confusion in the way this paragraph is expressed.

3.2 The comments referred to at paragraph 3.1.2 of PP8 appear to be extracts from the comments provided by the Board on 13 October 2014. As was explored in the April 2023 hearings, following the issue of these comments in October 2014 there were further discussions between the parties, culminating in a specific Environmental Matrix ("EM") meeting on 11 November 2014. The output of this meeting was a list of 7 bullet points which were then included in Section 5 of Schedule Part 6 of the Project Agreement as the Board's RDD comments at Financial Close. Reference is made to paragraph 8.8 - 8.13 and 9.6 - 9.16 of Multiplex's submissions produced following the April 2023 hearings, together with Section 7, of Multiplex's Response to the Inquiry's Provisional Paper 2.

Isolation Cubicles

3.3 At paragraph 3.1.12 PP8 there is reference to a query being raised on 22 September 2015 in relation to isolation cubicles in critical care.

3.4 As Multiplex understand it, the Request for Information ("RFI") was raised following a specalist ventilation workshop held on 1 September 2015.

3.5 MM responded on 25 September 2015 (Appendix 3) and this response was issued to Wallace Whittle the same day (Appendix 4).

3.6 Wallace Whittle responded with further information regarding their understanding of the Board's requirements, and this was issued to MM on 07 October 2015 (Appendix 5).

3.7 On 21 October 2015 MM responded with a further list of queries (Appendix 6).

3.8 These queries were responded to by Wallace Whittle and the response issued to MM on 23 October 2023 (Appendix 7).

4 Revision 5 of the EM

Ensuites and natural ventilation

4.1 Paragraphs 3.4.4 and 3.4.7 refer to alleged failures to update the EM in relation to Board comments regarding the use of en-suites and natural ventilation.

4.2 Multiplex do not consider this represents the full evidence avaliable in relation to this matter. The EM is a summary document, and it is accordingly necessary to also consider the detailed design documents.

4.3 The detailed design for critical care bedrooms and open plan bays did not show ensuites, nor rely on extract from en-suites as part of the ventilation design. The detailed ventilation design always showed supply and extract from the rooms. See the first revision of WW-Z4-01-PL-524-001 Rev 01 dated 01/07/2015 (Appendix 8) together with the final revision produced as Appendix 9.

4.4 The only room showing provision of extract ventilation through the ensuite in the detailed design is room 1-B1-075 which has an en-suite.

4.5 On 11 February 2016 NHSL made the comment that 1-B1-063 (4 bed bay) did not have an en-suite.

4.6 On 10 March 2016 Wallace Whittle responded stating:

> "*Refer to the design drawings for details. Generally, the extract is via the en-suite which is in line with SHPN 04. Where no ensuite is present, extract is via the room."* With the comment *"No action required.*

4.7 Likewise, the detailed design for the ventilation did not change in relation to the requirement for natural ventilation. All revisions showed 4 mechanical air changes in relation to the Critical Care bedrooms.

Risk Profile and Medical Location Categorisation and Grouping

4.8 At paragraph 3.4.11 of PP8 the Inquiry refer to a "*Risk Profile and Medical Location Categorisation and Grouping"* document.

4.9 Multiplex consider the reference to this document has the potential to cause confusion. This document relates to electrical matters and is used to determine what type of supply is required. It does not relate to ventilation requirements. SHTM 06-01 is the electrical services supply and distribution SHTM.

Derogation WW014 and WW015

4.10 Paragraph 3.4.21 of PP8 refers to *"derogation request WW014 and WW015"* being submitted *"on 03 June 2015 to seek acceptance of the derogation from SHTM 03-01 guidance regarding the single bedroom and ensuite air changes".*

4.11 Multiplex do not consider this is factually accurate.

4.12 WW014 was submitted on 03 June 2016, following a request by MM on 19 May 2016 regarding the air change rates in the single bedroom ensuites (Appendix 10).

4.13 WW0015 was submitted on 1 August 2016, following discussions with MM in relation to the agreed air change rates in the bedrooms (Appendix 11).

5 Revision 7 of the EM

Multi-bedroom ventilation design

5.1 Paragraph 3.6.18 of PP8 states:

"The Inquiry has been unable to confirm whether a ventilation workshop was held on 16 January 2017"

5.2 The ventilation workshop was re-scheduled to 23rd January 2017. (Appendix 12).

5.3 Following the meeting Wallace Whittle issued their "*Bedroom Ventilation Key Consideration Document"* (Appendix 13 and Appendix 14). The opening paragraph confirms the meeting was held on site on 23 January 2017.

5.4 Paragraph 9.4.47 PP8 states that: *"The Inquiry understands that the 'General Ward – Ventilation amendment proposal to achieve room balance' was accepted by NHSL and MM at this 24 February 2017 workshop."*

5.5 Multiplex do not consider this represents the full factual evidence in relation to this point, for completeness Multiplex would note the following:

5.5.1 The *General Ward – Ventilation amendment proposal to achieve room balance'* document discussed at the meeting on 24 February 2017 contained a proposal to achieve balanced pressure in the multi-bed wards by reducing the air change rate in these rooms to 3ac/hr, from the 4ac/hr.

5.5.2 The background to these discussions being that the Reference Design EM and EM included in the Project Agreement showed positive pressure in relation to the multi-bedrooms. In December 2016 and January 2017, however, it became apparent that the Board wanted to change this requirement and have balanced pressure.

5.5.3 Following the meeting on 24 February 2017, on 12 May 2017 Multiplex issued ventilation drawings to IHSL which showed how the change to negative or balanced pressure in the 14 multi-bed wards would be achieved (Appendix 15) In this email, Multiplex noted their position that this constituted a change for which the Board were liable.

5.5.4 Whilst the contractual position was disputed, the technical design discussions continued and in April 2018, Wallace Whittle provided a pack of drawings for a *"revised ventilation proposal to achieve a room balance at 4a/c"* (Appendix 16) This revised pack reflected the Board's decision that, whilst they wanted balanced pressure, they wanted to maintain 4AC, rather than reduce it to 3AC as per the previous proposal.

5.5.5 This revised proposal was discussed at a meeting with the Board on 12 April 2018.

5.5.6 In an email of 18 April 2018, the Board noted that revision 5 of the *"General Ward – Ventilation Amendment Proposal to Achieve Room Balance"* still showed air change rates between 2.7 and 3.5, whereas they were *"seeking a design for 4AC"* for all of the rooms addressed in the schedule – which included those in critical care (Appendix 17).

5.5.7 In response to this email Multiplex responded and confirmed they understood *"4AC is the brief"* and that the Schedule was being updated to reflect the 4ac/hr and balanced pressure requested for these rooms (Appendix 18).

5.5.8 On 22 May 2018, revision 6 of the "*General Ward – Ventilation Amendment Proposal*" was issued for RDD (Appendix 19). This was returned with Status B on 31 May 2018 (Appendix 20). This document states that the multi-beds in Critical Care are to have an overall air change rate of 4ac/hr.

5.5.9 Revision 7 of the "*General Ward – Ventilation Amendment Proposal*" was then issued through RDD on 21 June 2019 and given status A by the Board on 27 July 2018 (Appendix 21).

5.5.10 In parallel ventilation design drawing WW-Z4-01-PL-524-001 was updated to Rev J 01/05/2018 to introduce additional extract vent into B1-008, B1-031, B1-063 & B1-065 to achieve a room balance. This was given status B from NHSL Brian Currie 03/05/2018 (Appendix 22).

5.5.11 On 05 July 2018 an updated extract of the EM was then issued to the Board on 05 July 2018 showing the changed requirements in relation to the Multi-bedrooms (Appendix 23).

5.5.12 A draft programme was issued to Mercury on 11 May 2018, showing completion of works required to effect the changed pressure regime by 22 October 2018 (Appendix 24).

5.5.13 The commissioning records for AHU 04-06 (the AHU serving the critical care multi-bedrooms) are dated Supply 30/10/2018 and Extract 24/10/2018.

5.5.14 Finally, reference is also made to Section 9 of Multiplex's response to PP6 which explains how Item 7 of the Settlement Agreement confirmed NHSL's requirements for all multi-bed wards by reference to the design documents discussed above.

6 Revision 9 of the EM

6.1 Paragraph 3.7.15 PP8 states:

> *"Having identified that the agreed solution to achieve room balance was based on the incorrect SHTM 03-01 criteria, the Inquiry understands that progress on the proposal ceased from 23 May 2017".*

6.2 Reference is made to Section 5 above, Multiplex do not consider this paragraph is factually accurate. The solution to achieve balanced pressure in the multi-bed wards was approved through RDD and implemented.

6 October 2023

By e-mail only – [redacted]

For the attention of Inquiry Team
Scottish Hospitals Inquiry

Our Ref: TUVS/2/3
Your Ref: TBC
Direct e-mail: [redacted]

Dear Sir or Madam

TUV SUD Limited/Wallace Whittle Limited (TSWW)
RHCYP/DCN Edinburgh
Response to Provisional Position Paper 8 – Detection of potential CCU Issue during the Construction Phase

TSWW welcomes the opportunity to comment on Provisional Position Paper 8, setting out the Inquiry's preliminary view on how the potential issue in the Critical Care department of the Royal Hospital for Children and Young People and the Department of Clinical Neurosciences could have been detected during the Construction Phase of the project.

We note that Core Participants are directed to confine their comments to only those matters requiring material clarification or correction, particularly in relation to matters of fact.

With that direction in mind, please find below our response, on behalf of TSWW, following the order and paragraph numbering of the working paper ("the Paper").

Introduction

As the Paper fairly acknowledges, at paragraphs 1.9. and 1.12, the use of expressions such as "discrepancies" and "non-compliance" are controversial and those expressions are in themselves somewhat judgemental.

While TSWW is content to adopt these expressions as a short hand way of referring to the issues that ought to have been identified and resolved during the construction phase, it does so with the proviso that not only does it not accept that there was any non-compliance with contractual requirements, nor does it accept that there was in fact non-compliance with the published guidance SHTM 03-01 or indeed an irreconcilable discrepancy between its design and the design recommendations set out in Table A1 to SHTM 03-01.

The significance of this point, in the particular context of issues discussed in the Paper, is that, having arrived at its own conclusions as to the ventilation design requirements for the Critical Care areas – adopting the Hulley & Kirkwood (H&K) interpretation of Table A1 of SHTM 03-01 - which:

(a) TSWW understood had already undergone technical review on behalf of NHSL as well as being confirmed by H&K themselves as being compliant with published guidance (see paragraph 4.21);

(b) TSWW considered consistent with the physical design, layout and capacity of the Critical Care areas, their understanding as to the clinical function of those areas and the need to strike a balance between

fresh air, odour reduction, temperature and infection control, on the one hand, and energy efficiency on the other; and

(c) had not been questioned during the period up to Financial Close;

TSWW were given no reason, and were unlikely themselves, to question or revisit their own design: and thereby "detect" any issues. In other words, TSWW, believing the H&K ventilation criteria for the Critical Care areas to have been reviewed, confirmed and thereby "hardwired" into the EM and BCRs, and themselves understanding and endorsing the rationale behind it, were largely dependent on others, such as those involved in the RDD process (See Table 4.3 of the Paper), to detect and flag up what they (those others) considered to be discrepancies.

The RDD Review Procedure

4.6 It is worthy of note that, while TSWW agrees with the definitions of each of the levels of endorsement, as set out in the Paper, its experience, in practice, was that the Level (or Category) B definition was not adhered to by NHSL, in the sense that an item ought not to have been designated Level B if it required resubmission, yet TSWW was finding that NHSL was not only requiring resubmission of various Level B items but it was even, in some cases (the EM being one example) relegating them back to Level C. TSWW had never before experienced a review process being operated in this manner.

4.9 Consistent with the point made in the Introductory comments above, TSWW was not a party to the decision not to approve the EM at Financial Close but instead to include the EM and the Ventilation Distribution design for all floors of the hospital, including the Critical Care department, in the RDD schedule. TSWW was thus denied the opportunity to gain a full understanding of the reasoning behind that decision and indeed to question its workability.

4.14 It is important to put the fact that the EM ended up at "revision 11, version 33" in perspective. Not all 11 of these revisions were categorised by the Board. As the Timeline in section 3 of this Paper bears out, TSWW have on record only some 5 categorised submissions, post Financial Close, 2 of which were in fact reversals of previous categorisations. (see paragraph 4.6 above) Furthermore, as noted at paragraph 4.15.7 of the Paper, despite a lack of agreement on some of the ventilation parameters, NHSL twice approved the EM at Level B status, thereby not only failing to follow the agreed procedure in relation to levels of endorsement but also artificially increasing the number of iterations (i.e. versions) of the EM.

4.15.2 The very questioning by NHSL of ventilation parameters for specific single bedrooms or open plan bays within the Critical Care areas, rather than considering the area as a whole, seems to sit at odds with the notion (with which TSWW disagrees in any event) that the Critical Care areas as a whole ought to be subject to the same air changes and pressure requirements: namely those set out in Table A1 of SHTM 03-01. Those requirements are not, for example, confined even to patient accommodation and, taken literally, would include nursing stations, storage areas etc., in which it would be almost impossible to achieve 10 ac/h and maintain 10 Pa of positive pressure.

4.15.6 With regard to MM declining TSWW's suggestion of a final line-by-line review of the EM being undertaken (on the basis of TSWW confirming that it had already carried its own in-house line-by-line review), this again comes back to the point made earlier in this Response that it was inherently unlikely that TSWW would question its own, hitherto unquestioned, interpretation of Table A1 of SHTM 03-01 and its design based on that interpretation. TSWW's "self-review" was therefore inevitably of much more limited value than a review by a third party, from the point of view of offering an opportunity for any supposed discrepancies to be identified.

4.16 The fact that the final review of EM Rev 11 in October 2017, which concluded its development through the RDD process, did not contain the final agreed specifications for ventilation in multi-bed rooms (those instead being contained in a Settlement Agreement to which TSWW were not a party) meant that TSWW did not have full visibility as to the outcome of the RDD process.

4.20 Drawing together the foregoing observations in summing up on whether the RDD process is an appropriate means of finalising the design of critical ventilation systems in clinical areas where:

- there may be differing interpretations of guidance;
- there is an enhanced clinical risk associated with non-compliant design;
- changing one element of the design may have a knock-on effect on other (already agreed) parts of the design;
- the construction materials (such as ductwork and air handling units) are based on the specified design;

the view taken by TSWW is that the RDD process can be a useful tool but *only* where there is a clear and unambiguous brief of the client's requirements (here the BCRs) in place *in advance* of the RDD process, thereby enabling the parties to use the RDD process to review the suggested solutions for achieving that brief and agree on the best approach. It is also important that there is transparency throughout the process, and a clear audit trail or "tracker" accessible to any parties associated with or impacted by that process, particularly surrounding the ultimate outcome and any conclusions reached.

In TSWW's view, a RDD process should not be used as a means for developing the design brief (except perhaps in the case of limited and isolated cases of change of room use etc.) and in any event, a RDD process should be programmed to, and should reach, completion ideally:

- in time to allow due consideration to be given to any wider ramifications (e.g. application of the same design salutation elsewhere or knock on effect on other aspects of the design);
- ahead of the specification and ordering of materials (such as ductwork and air handling units) on the basis of the agreed specified design; and
- prior to the agreed commencement of the construction of the systems in question but also any associated site installations.

4.23 In TSWW's view, if notwithstanding the assurances it had received from MM and H&K, NHSL continued to have any doubts or concerns over the accuracy of the briefed EM, then it would have been both appropriate and proportionate for it to instruct an independent audit by another engineer but (1) that is a step which, in TSWW's opinion, ought to have been taken earlier on in the process, ideally at the Reference Design stage or at least prior to Financial Close: the point being that it is a client briefing issue rather than a design development and/or detailing issue; and (2) that that was essentially the role played being played by MM, as technical advisers to NHSL, albeit that there seems no reason why it should not have been appropriate and proportionate for NHSL/MM to seek a further opinion where the circumstances justified it. Having a separate audit undertaken by another engineer (whether MM or another party), earlier in the process, ought to have resolved any issue of potential non-compliance of the EM and thus obviated the need to include the EM in the RDD process.

Multi-Bed Room Dispute

5.3 TSWW's recollection is that the disagreement between NHSL and Project Co had been discussed at length well before the submission of the derogation requests, such that it was anticipated that the signing off and issuing of the derogations would be more or less a formality by the time the requests came to be submitted.

5.5 In TSWW's view. Project Co were right to have questioned NHSL's reference to a 4 bedded room in the context of its (Project Co's) derogation request which was for single bedrooms only (the design solution for which was different to that for a 4 bedded room, albeit that both have 6 ac/h).

5.6 TSWW would agree that the ventilation design in the Critical Care 4 bedded/multi-bed rooms was considered in detail as part of the ventilation workshops held over the course of early 2017. The participants in that process, namely Project Co, MM and NHSL, were therefore well aware of the proposed ventilation solutions within the Critical Care areas. Returning to the observation made at paragraph 4.15.2

above, MM and NHSL must (or ought) therefore to have realised that any differentiation in the treatment of 4 bedded rooms and single bedrooms, or even any debate around the issue, was impossible to reconcile with the notion that the Critical Care areas as a whole ought to be subject to the same air changes and pressure requirements, as set out in Table A1 of SHTM 03-01.

5.13 The fact that those separately engaged by NHSL and Project Co to provide advice on the interpretation of SHTM 03-01 and the Board's Construction Requirements - David Rollason and DSSR, respectively - were unable to reach a definitive interpretation of SHTM 03-01 in respect of recommendations for 4 bedded /multi-bed rooms illustrates the lack of clarity of both the relevant published guidance and the design brief.

5.15 Likewise, the inability of the Independent Tester. Arcadis, to reconcile the apparently conflicting requirements contained within Schedule Part 6 (Project Co Proposals) with respect to 4 bedded/mulit-bed bed rooms, and provide a definitive opinion to resolve the disagreement, suggests or reflets a lack of clear design intent and client brief within the BCRs.

5.17 TSWW believes that the "4 bed room tracker" produced to assist NHSL in negotiations with Project Co was, in fact, prepared by them (TSWW) to facilitate the process of reviewing and capturing the ventilation requirements for all multi-bed rooms.

Settlement Agreement

6.2 Without having been involved in the discussions leading to the Settlement Agreement, having seen the full Settlement Agreement, knowing what it resolves and on what basis, and without being able to put the sections abstracted in the Paper in context, TSWW is wary of offering any comment on it.

6.4 For example, the Paper makes reference to a derogation to relieve Project Co of its obligation to comply with the air change rates recommended for single bedrooms in SHTM 03-01 (on the basis that 4 air changes would be supplemented by a natural ventilation supply of 2ac/h through openable windows), yet TSWW have no immediate record or recollection of ever confirming that 2ac/h could reliably be provided by the openable windows. In their view, this would be impossible to offer because it is not technically possible to achieve a consistent airflow through natural ventilation.

Provisional Conclusions

Subject to the various comments above and based on certain matters which it has only been able to glean of the first time from the Paper and supporting documents, TSWWL would make the following comments on the provisional conclusions reached by the Inquiry Team:

7.1 In TSWW's view, the effectiveness of any RDD process depends on the clarity of the design brief against which that process is being undertaken.

7.2 Agreed subject to comments at paragraph 4.14 above.

7.5 Agreed, although, as far as TSWW is aware, the specific term "neutropenic" was not used within the BCRs or any other client briefing information

7.6 Agreed that this is an accurate narration of NHSL's position. TSWW's position was that SHTM 03-01 was silent as to the pressure regime for a general award and because H&K, and in turn TSWW, equated multi-bed rooms to general wards, there was nothing inconsistent in the EM defining the pressure for the multi bed rooms as being positive. This query over the correct pressure regime for multi bed rooms arose late in the day, after the construction phase was well underway.

7.8 Agreed subject to the Introductory comments set out above.

7.9 It is agreed that this issue was not specifically identified and addressed in the context of the dispute over multi-bed rooms. TSWW's position is that it had already by then identified that a positive pressure regime

was recommended in SHTM 03-01 but, in its opinion, only for isolation rooms within the Critical Care areas, so as to achieve pressure differentials between discreet areas within the Critical Care area as a whole.

7.10 TSWW would disagree with this conclusion as it believed that its design was compliant

7.12 Noted, although TSWW is not in a position to comment.

7.13 Agreed that this would have been an appropriate step when it became clear that SHTM 03-01 did not unambiguously define recommended conditions for multi-bed rooms.

7.14 Noted, although not for TSWW to comment, other than to suggest that Andrew Poplett's advice would apply to the actions that ought to be undertaken during the initial briefing process, i.e. in the case of the RHCYP/DCN Edinburgh, at the Reference Design stage.

7.15 Noted, although TSWW is not in a position to comment.

7.16 Agreed, hence TSWW's comments at 4.20 and 7.14 above.

7.17 Agreed. In TSWW's opinion, since these are matters relating to the correct interpretation of the clients' briefing (i.e. the BCRs), they ought to have been identified and largely if not entirely resolved in the course of the review process undertaken prior to Financial Close.

Questions

8.1 TSWW would generally agree with the findings other than the statement that the critical Care design was non-compliant. Reference is made to the comments in the preceding section.

TSWW would wish to add, however, that it would be important to also examine the steps taken by NHSL after the decision to delay the opening: specifically, to the meetings held after this point and the Reports prepared by TSWW (and, it is assumed, others) detailing amongst other points the lack of response by NHSL to TSWW's request for examples of other Scottish hospitals or healthcare facilities with 10 ac/h and 10 Pa of positive pressure throughout an entire Critical Care area.

TSWW would also wish to bring to the Inquiry's attention the failure of NHSL to produce to TSWW its own Report, as requested and agreed, to enable to HFS to consider the merits of both parties' arguments.

It may of course be that the Inquiry has it in mind to consider this chapter in the context of a further PPP or during the forthcoming further evidential hearing but TSWW consider it worthy of mention at this juncture, lest the point be lost sight of.

TSWW would further suggest that the Inquiry may wish to examine the scope of the works undertaken by NHSL on site *after* the delay to opening. If, as is believed to be the case, this involved issues and areas outwith the Critical Care area, the scope and magnitude of the works involved in addressing those issues may have had a bearing on the extent of the delay.

Further and finally, TSWW would suggest that it may be appropriate to consider the briefed architectural solutions. As TSWW has previously stated in the course of this Inquiry, the ventilation design follows, and is therefore to a large extent dictated by, the architectural layout and not vice versa. The architectural solution involves specifications of finishes which differ significantly for pressurised and non-pressurised rooms. For example lay-in tiled ceilings, which were specified and installed for the 4 bedded rooms in the Critical Care areas, are not suitable for pressurised rooms. Similarly an alternative model of light fitting is required, the physical accommodation of ductwork and restrictions to ceiling void access are among other factors which have to be considered.

Accordingly, when considering what early actions could have altered outcomes, it is suggested that more focus be placed on the early briefings and overall building specifications process, rather than placing a narrow focus on the ventilation systems, or even one specific aspect of the ventilation systems, alone.

8.2 For others to answer.

8.3 For others to answer.

8.4 For others to provide.

8.5 For others to answer/provide.

8.6 For others to answer.

8.7 In TSWW's view, the 4 ac/h reflected the clients' briefed requirements as per the original EM. As stated above at paragraph 6.4 above, TSWW has never expressed or endorsed the view that openable windows can provide a reliable and constant equivalent to 2 ac/h. The original briefing figure of 4 ac/h is assumed to have been derived from a review of Building Standards requirements, having regard to the likely occupation levels and with a view to efficient energy consumption. In TSWW's view, these are matters which should have been reviewed and agreed by NHSL and their designers during development of the Reference Design.

8.8 This is for others to answer and TSWW were not party to this decision. Their design did not include or rely upon provision of ventilation by means of natural ventilation. They did not consider the openable windows as being essential to the ventilation system design.

8.9 In TSWW's view, the ventilation design for both single occupancy and 4 bedded rooms should and could have been resolved far more quickly that it was. TSWW offered line-by-line reviews of the EM on a number of occasions and these were rejected.

8.10 As to TSWW's own part in why the RDD process did not detect the specific requirements for air change rates and pressure regime in Critical Care areas, reference is again made to the Introductory observations in this Response. Again, though, TSWW adheres to the view that these are matters which ought to have been identified, if not in the context of the original client briefing, certainly during the period prior to Financial Close. TSWW would also wish to reiterate that consideration should be given to the timeline and appropriateness of the actions taken even when the issue was identified, long after the initial RDD process, as noted at paragraph 8.1 above.

8.11 For others to answer.

8.12 TSWW believes that RDD, when operating correctly, is an appropriate means of reviewing designs. This has been historically utilised in many contracts, including non-healthcare projects, and proven suitable and effective tool to deliver appropriate solutions to meet the clients briefed requirements. In TSWW's view, however, the key to making this a robust and useful process is that the project brief has to have been properly and robustly prepared and signed off by the client, and therefore essentially "fixed", before the commencement of the RDD process.

Narrative of Review of Environmental Matrix

9.1.5 TSWW does not accept that the changes made to the EM in respect of Critical Care bedrooms did not comply with SHTM 03-01 recommendations. TSWW has yet to be see evidence supporting that contention.

9.1.7 The reference here and elsewhere to 4 ac/h was a reflection of NHSL's briefed Reference Design/EM requirements. TSWW had no vested interest in applying 4 ac/h but simply sought clarification of the Board's requirements.

9.1.8 TSWW annotated the EM to clarify that it was excluding isolation rooms on the basis that those called for their own specific ventilation regime, separate from other 'bedrooms'.

9.1.13 TSWW took it that MM agreed with its proposal regarding the issue raised in relation to isolation cubicles in Critical Care.

9.3.3 TSWW did not consider itself to be changing the design criteria but clarifying or qualifying the Guidance Note in the EM to reflect its interpretation of SHTM 03-01 and to define those areas which, in accordance with SHTM 03-01, required 10 ac/h and 10 Pa Pressure. As has been previously noted, this clarification was in any event noted and commented upon by MM. TSWW's understanding was that it needed only to highlight any changes to the tabulated information which it had not in fact altered.

9.4.1 As regards Revisions 3 and 4 of the EM, TSWW believes that these were designations given to internal working versions which were then superseded and therefore never formally issued.

9.4.15 Per the comments at paragraph 4.6 above, having been given Level B status, the EM ought at that point to have ceased being an active RDD item and ought not to have needed to be resubmitted for further review (whereas it in fact remained within the RDD process and underwent 6 further iterations).

9.5 TSWW can find no record of revision 6 of the EM being categorised by the Board.

9.6.23 The proposals to achieve NHSL's desired pressure regime in the multi bed rooms were prepared following Board guidance that the air supply could be based on compliance with Building Regulation ventilation rates for occupancy. The proposed air change rates were thus derived from the appropriate Building Regulation ventilation rates.

9.6.27 The reference to neutropenia was introduced late on in the project and it had not hitherto been specifically mentioned, let alone addressed in the client briefing. TSWW, as engineers, were not qualified to make an assessment of what design changes might be necessary to suit the requirements of patients with neutropenia: a clinical condition. The use to which certain wards would be put and the requirements for those wards, based on the clinical needs of intended patient population, were matters that ought to have been factored into the client briefing.

9.6.43 TSWW prepared the report titled "General ward - ventilation amendment proposal to achieve room balance" at the request of MPX with a view to identifying the extent of works required. This was to allow consideration to be given to whether or not to proceed with what TSWW understood *not* to be mandatory requirements.

9.7.2 TSWW never at any point suggested (and would never suggest) that openable windows provide the equivalent of 2 ac/h. Natural ventilation is subject to many variables, such as wind direction and speed, such that it cannot be relied upon to provide a specified and uniform level of performance.

9.7.23 The e-mail of 7 July 2017 tends to suggest that the discussion around the multi bed rooms was centred around commercial considerations.

9.7.24 TSWW has no record of its counter responses being challenged and it would appear that a definitive view was never reached.

9.8.4 TSWW can find no record of revision 10 of the EM being categorised by the Board.

9.10 Without having been involved at all in the discussions leading to the Settlement Agreement, having seen the full Settlement Agreement or knowing what it resolves and on what basis, TSWW is not in a position to comment on it.

9.10.31 NHSL appear to have accepted 4 ac/h for those multi bed rooms and single bedrooms (other than isolation rooms) that sat within the Critical Care areas.

We trust that the foregoing is of assistance but should the Inquiry have any queries, or require any further information or clarification, then we/TSWW would of course be willing to provide it.

Yours faithfully

Alan Eadie
Partner
For and on behalf of BTO Solicitors LLP

06 October 2023

By e-mail only – [redacted]

For the attention of Inquiry Team
Scottish Hospitals Inquiry

Our Ref: TUVS/2/3
Your Ref: TBC
Direct e-mail: [redacted]

Dear Sir or Madam

TUV SUD Limited/Wallace Whittle Limited (TSWW)
RHCYP/DCN Edinburgh
Response to Provisional Position Paper 8 - Chronology of the Reviewable Design Data Process

TSWW welcomes the opportunity to comment on Provisional Position Paper 8, setting out the Inquiry's review of the Chronology of the Reviewable Design Data Process.

We note that Core Participants are directed to confine their comments to only those matters requiring material clarification or correction, particularly in relation to matters of fact.

With that direction in mind, please find below our response, on behalf of TSWW, following the order and paragraph numbering of the working paper ("the Paper").

Introduction

1.6 It is worthy of note that, while TSWW agrees with the definitions of each of the levels of endorsement, as set out in the Paper, its experience in practice was that the Level B definition was not adhered to by NHSL, in the sense that an item ought not to have been designated Level B if it required resubmission, yet TSWW was finding that NHSL was not only requiring resubmission of various Level B items but it was even, in some cases (the EM being one example) relegating them back to Level C TSWW had never before experienced a review process being operated in this manner.

Narrative of Review of Environmental Matrix

3.1.5 TSWW does not accept that the changes made to the EM in respect of Critical Care bedrooms did not comply with SHTM 03-01 recommendations. TSWW has yet to be see evidence supporting that contention.

3.1.7 The reference here and elsewhere to 4 ac/h was a reflection of NHSL's briefed Reference Design/EM requirements. TSWW had no vested interest in applying 4 ac/h but simply sought clarification of the Board's requirements.

3.1.8 TSWW annotated the EM to clarify that it was excluding isolation rooms on the basis that those called for their own specific ventilation regime, separate from other 'bedrooms'.

3.1.13 TSWW took it that MM agreed with its proposal regarding the issue raised in relation to isolation cubicles in Critical Care.

3.3.3 TSWW did not consider itself to be changing the design criteria but clarifying or qualifying the Guidance Note in the EM to reflect its interpretation of SHTM 03-01 and to define those areas which, in accordance with SHTM 03-01, required 10 ac/h and 10 Pa Pressure. As has been previously noted, this clarification was in any event noted and commented upon by MM. TSWW's understanding was that it needed only to highlight any changes to the tabulated information which it had not in fact altered.

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3.4.15 Per the comments at paragraph 4.6 above, having been given Level B status, the EM ought at that point to have ceased being an active RDD item and ought not to have needed to be resubmitted for further review (whereas it in fact remained within the RDD process and underwent 6 further iterations).

3.5 TSWW can find no record of revision 6 of the EM being categorised by the Board.

3.6.23 The proposals to achieve NHSL's desired pressure regime in the multi bed rooms were prepared following Board guidance that the air supply could be based on compliance with Building Regulation ventilation rates for occupancy. The proposed air change rates were thus derived from the appropriate Building Regulation ventilation rates.

3.6.27 The reference to neutropenia was introduced late on in the project and it had not hitherto been specifically mentioned, let alone addressed in the client briefing. TSWW, as engineers, were not qualified to make an assessment of what design changes might be necessary to suit the requirements of patients with neutropenia: a clinical condition. The use to which certain wards would be put and the requirements for those wards, based on the clinical needs of intended patient population, were matters that ought to have been factored into the client briefing.

3.6.43 TSWW prepared the report titled "General ward - ventilation amendment proposal to achieve room balance" at the request of MPX with a view to identifying the extent of works required. This was to allow consideration to be given to whether or not to proceed with what TSWW understood *not* to be mandatory requirements.

3.7.2 TSWW never at any point suggested (and would never suggest) that openable windows provide the equivalent of 2 ac/h. Natural ventilation is subject to many variables, such as wind direction and speed, such that it cannot be relied upon to provide a specified and uniform level of performance.

3.7.23 The e-mail of 7 July 2017 tends to suggest that the discussion around the multi bed rooms was centred around commercial considerations.

3.7.24 TSWW has no record of its counter responses being challenged and it would appear that a definitive view was never reached.

3.8.4 TSWW can find no record of revision 10 of the EM being categorised by the Board.

3.10 Without having been involved at all in the discussions leading to the Settlement Agreement, having seen the full Settlement Agreement or knowing what it resolves and on what basis, TSWW is not in a position to comment on it.

3.10.31 NHSL appear to have accepted 4 ac/h for those multi bed rooms and single bedrooms (other than isolation rooms) that sat within the Critical Care areas.

We trust that the foregoing is of assistance but should the Inquiry have any queries, or require any further information or clarification, then we/TSWW would of course be willing to provide it.

Yours faithfully

Alan Eadie
Partner
For and on behalf of BTO Solicitors LLP

Public Inquiry: Queen Elizabeth University Hospital, Glasgow and the Royal Hospital For Children and Young People and Department of Clinical Neurosciences, Edinburgh ("The Inquiry" Or "SHI")

Response on behalf of IHS Lothian Limited to the Inquiry's Provisional Position Paper 8 (Advance Copy) relating to the Royal Hospital for Children and Young People and Department of Clinical Neurosciences ("RHCYP/DCN" or "Project")

1. INTRODUCTION

1.1 This document forms the response ("**Response**") on behalf of IHS Lothian Limited ("**IHSL**") to the Inquiry's document entitled: *'Provisional Position Paper 8: How the potential issue in the Critical Care department of the Royal Hospital for Children and Young People and the Department of Clinical Neurosciences could have been detected during the Construction Phase*' ("**PPP8**").

1.2 PPP8 was issued by the Inquiry Team to Core Participants as an Advance Copy by e-mail dated 6 September 2023. PPP8 contains some sections not found in the version posted on the Inquiry's website. At the Inquiry Team's request, IHSL will provide a separate response to the version of the Inquiry's Provisional Position Paper 8 posted on the website.

1.3 The Inquiry Team has advised Core Participants ("**CPs**") (under the heading 'Purpose of Paper') that PPP8 specifically will consider the Reviewable Design Data process and "*highlight the potential missed opportunities to detect the discrepancy between the Environmental Matrix and SHTM 03-01."*

1.4 IHSL notes the Inquiry Team's comment that the Chair is likely to be invited by the Inquiry Team to make findings in fact based upon the content of PPP8 and that CPs may seek to "*correct and/or contradict it by way of response".* Accordingly, IHSL notes that the Inquiry's understanding of matters set out in PPP8 may change and the position set out in PPP8 remains provisional.

1.5 IHSL has set out its comments in response to PPP8 below. This Response is structured as follows:

1.5.1 Executive Summary

1.5.2 Section 1 – Introduction

1.5.3 Section 2 – Governance and Project Management

1.5.4 Section 3 – Timeline of the Construction Phase

1.5.5 Section 4 – the RDD Review Procedure

1.5.6 Section 5 – Multi-Bed Room dispute

1.5.7 Section 6 – Settlement Agreement 1

1.5.8 Provisional Conclusions

1.5.9 Questions

1.6 IHSL has adopted the headings used by the Inquiry Team in PPP8 in this Response.

1.7 IHSL has sought to respond to PPP8 only in relation to matters which are within its own knowledge. It does not seek to provide submissions in relation to the matters addressed in PPP8. As invited by the Inquiry Team, IHSL's comments are limited to the factual matters where IHSL might seek to "*correct and/or contradict*" the contents of PPP8.

1.8 IHSL notes the Inquiry Team's reminder that section 2 of the Inquiries Act 2005 provides that an inquiry is not to rule on, and has no power to determine, any person's civil or criminal liability. The issue of any liability arising under the Project Agreement is not a question for the Inquiry to rule on or determine.

1.9 IHSL would identify two corrections in the Glossary contained at the start of PPP8. First, IHSL notes the description of "IHSL": the correct designation is "IHS Lothian Limited". Second, the correct description of "SA1" is "Settlement and Supplemental Agreement No.1"

2. EXECUTIVE SUMMARY

2.1 IHSL has certain reservations regarding the terms used in PPP8 and the premise which the Inquiry Team has adopted in PPP8. With regards to the term "non-compliance", IHSL adopts the Inquiry Team's specific and narrow definition of the term for the purposes of this Response in so far as it means that the Environmental Matrix and agreed resolution in SA1 did not reflect the summary in Table A1 of SHTM 03-01. IHSL adopts the term "discrepancy" in this Response in so far as the word means *a difference between* (rather than any suggestion of there being a conflict or anomaly).

2.2 Nevertheless, for the purposes of this Response IHSL has accepted the premise adopted by PPP8 in so far as it seeks to identify potential missed opportunities for highlighting the differences between the environmental requirements in the Environmental Matrix and the resolution agreed in SA1 when compared against the recommended guidance in SHTM 03-01 and, more particularly in Table A1 of Appendix 1 (notwithstanding that NHSL obtained the ventilation system it wanted and IHSL and MPX delivered the ventilation system it was contractually required to deliver).

2.3 IHSL does not wish the Inquiry to lose sight of the fact that it, and its main contractor MPX, delivered the hospital which was specified by NHSL as per SA1. The resolution in SA1 formed part of the completion requirements for the Project: completion was signed off by the Independent Tester and a Certificate of Practical Completion was issued on 22 February 2019. The terms of SA1 were approved and authorised by NHSL's legal, financial and technical advisors. In addition, NHSL obtained Scottish Government approval to enter into SA1.

2.4 IHSL understands that the primary cause of the delay to the opening of the RHCYP/DCN was a non-compliance with the air change rates recommended for those Critical Care areas and a non-compliance with the pressure regime recommended for those Critical Care areas. IHSL also seeks

to address in this Response the potential missed opportunities to identify the differences between NHSL's requirements for the pressure regime and the recommendations in the relevant guidance.

2.5 In IHSL's view, care should be taken when using Table A1 as a reference point. The Inquiry has heard evidence that Table A1 is not the sole source of data for design and briefing but rather a nuanced summary which requires to be read with the whole of SHTM 03-01 and the rest of NHS Guidance relevant to the Project. There is the risk that Table A1 is being used in PPP8 as an overly simplified 'easy go to' rather than as guidance which requires to be placed in its wider context.

2.6 A consideration of potential missed opportunities to highlight the differences between the Environmental Matrix and the agreed resolution in SA1 and the SHTM 03-01 involves a degree of speculation, hypothesising and hindsight. IHSL has sought to avoid speculation in this Response as far as possible.

2.7 PPP8 identifies a number of potential opportunities that may have been missed through the Reviewable Design Data review procedure or through the drafting of NHSL internal documents. In IHSL's view, it is significant that there were additional potential missed opportunities to highlight the differences with the guidance when external parties (i.e. other than NHSL's project delivery team) got involved. IHSL has in mind the following events.

2.7.1 The request made by NHSL to HFS in June 2016 for HFS's view on the interpretation of the ventilation pressure requirements in four-bed rooms. When advising of its view that the 4-bed rooms should have negative or balanced pressure, HFS did not identify that the recommended guidance for ventilation pressure may differ depending on where the four-bed rooms were located (e.g. the guidance recommends a different pressure regime for rooms in Critical Care areas). HFS is the responsible custodian for all Guidance (including SHTMs) for NHSS facilities.

2.7.2 NHSL instructed an independent expert, David Rollason, in late 2017 to provide an opinion on the ventilation pressure requirements in 4-bed rooms. Mr Rollason's view was that Good Industry Practice required that the ventilation pressure regime in the 4-bed rooms should be negative or balanced relative to the adjacent space. The difference in the guidance for the pressure regime in rooms in Critical Care was not identified by Mr Rollason (notwithstanding that his report specifically referenced the room details of the four-bed rooms in Critical Care). NHSL required all 4-bed rooms to have a pressure regime which was negative or balanced relative to the adjacent space whereas SHTM 03-01 recommended that rooms in Critical Care be +10 Pa relative to the adjacent corridor.

2.7.3 The occurrence in February 2017 when the 'Project Manager, Children's Services Lead' identified from STHM 03-1 that different ventilation requirements applied to neutropenic

patient wards. This led to a review of SHTM 03-01 by NHSL and MML but this did not appear to identify that there may be other areas (such as rooms in Critical Care areas) that had the same recommended guidance as the neutropenic patient wards.

2.7.4 The issue of the draft Court summons to IHSL in March 2018. The finalisation of that summons would have involved considerable scrutiny and effort to articulate NHSL's requirements for the ventilation in the 4-bed rooms in order to identify the solution in respect of which NHSL sought Court orders. The Court summons set out NHSL's requirement that all the 4-bed rooms required to have negative or balanced pressure relative to the adjacent corridor – notwithstanding that SHTM 03-01, Table A1 recommends +10Pa in Critical Care areas. The draft Court summons did not reference an air change rate but as at March 2018 the versions of the Environmental Matrix, NHSL's internally prepared documents and Mr Rollason's report had all recognised that the air change rate was 4 ac/hr. The draft Court summons was also supported by affidavit evidence from (amongst others) NHSL's Project Clinical Director who specified requirements that were different to SHTM guidance. The fact that NHSL's Project Clinical Director specified requirements that were different to SHTM guidance serves to illustrate why IHSL has concerns around the description of the differences with guidance being described as a "discrepancy". The Project Clinical Director would have understood the clinical function of bespoke paediatric spaces designated for particular patient cohorts – and specified NHSL's requirements accordingly. It is not clear to IHSL how NHSL's expressed requirements which were different to the summary guidance in SHTM 03-01 can be described as a discrepancy. The difference between NHSL's requirements and the guidance in SHTM 03-01 is deliberate – it's not a discrepancy.

2.8 Parties spent a considerable amount of time and effort over many months (and indeed years) to resolve the disputed issues around ventilation (both air change rates and pressure regimes). NHSL took steps (which included the threat of legal proceedings seeking interim specific orders) to ensure that it obtained the ventilation system that it wanted. The agreed resolution was reflected in SA1 which confirmed NHSL's requirements that the hospital required to be completed to. The Independent Tester certified completion in accordance with the agreed resolution in SA1.

3. **SECTION 1 – 'INTRODUCTION'**

Paragraphs 1.1 and 1.2 – Reviewable Design Data

3.1 Paragraph 1.1 of the 'Introduction' refers to the Project entering into the construction phase with a proportion of the design still to be agreed (including some of the room environmental conditions contained in the Environmental Matrix). Paragraph 1.2 states that this was made possible by a provision in the Project Agreement which allowed for the parties to categorise elements of unfinished design work as 'Reviewable Design Data'.

3.2 Whilst the statement at paragraph 1.2 of PPP8 is factually correct, IHSL wish to emphasise to the Inquiry Team that the Reviewable Design Data provisions in the Project Agreement are standard form provisions contained in the Scottish Future Trust's 'Standard Form Project Agreement'. Reviewable Design Data provisions are standard in PFI/PPP and NPD project agreements (a position which appears to be recognised to an extent by the Inquiry Team at paragraph 4.1 of PPP8).

3.3 The SFT's standard form project agreement (appropriate for use with the NPD model) which (by 2015) would have reflected over a decade's worth of learning and experience of procuring public projects using the PFI/PPP model. The Reviewable Design Data provisions in the Project Agreement were not novel or any departure from standard practice. The Reviewable Design Data procedure was not a bespoke compromise solution allowing the parties to enter into the construction phase with an element of incomplete design. The standard form project agreement specifically envisages that there will be Reviewable Design Data that will be subject to the Reviewable Design Data procedure and provides standard form drafting to accommodate it.

3.4 Furthermore, whilst certain elements of the Environmental Matrix and Room Data Sheets required to be progressed through the review procedure before construction of those elements could commence, the parties would not (certainly IHSL would not) have anticipated that the development of those elements of the Environmental Matrix or the remaining Room Data Sheets (either by their volume or their nature) would have had any material impact upon the cost, programme and risk profile accepted at Financial Close. At Financial Close, the construction costs for the Project become fixed as do IHSL's quantum and costs of borrowing (i.e. IHSL raises the correct amount of project debt for the price agreed at Financial Close) and the financial model (which will bear upon the payments to be made by NHSL for the provision of the Services) will be concluded. Whilst the Reviewable Design Data review procedure allows a degree of design development, it does not envisage that such development will lead to changes that may have a significant impact on costs or the time to deliver the facility and it does not allow NHSL to revisit its requirements leading to significant design changes.

3.5 This is recognised, for example, in the paper prepared by Janice Mackenzie, Fiona Halcrow and David Stillie referred to at paragraph 9.2.3 of PPP8 which provided instructions for the "B1- Critical Care Unit" user group. This paper stated: "*It is important to note that the RDD process is to conclude the previous work undertaken and is not an opportunity to re-design the department.*"

3.6 Reference is made to IHSL's Response to PPP4 for further comments on the provisions of the Project Agreement.

Paragraph 1.7 – Table A1 of SHTM 03-01

3.7 Paragraph 1.7 of PPP8 states that "*The specific design information contained in Table A1 covers all the key parameters of the ventilation system"*. IHSL does not agree that Table A1 is fully comprehensive if that is what the Inquiry Team means by this statement.

3.8 IHSL refers to its Closing Submission to the Inquiry following the hearings which took place in May 2022 and April/May 2023. The Inquiry heard evidence that SHTMs are guidance that is open to interpretation. The guidance can be inconsistent and contradictory. The Inquiry heard that ambiguities and inconsistencies are typical and that SHTM 03-01 is no exception. SHTM 03-01 is not fully comprehensive (it does not cover every type of room in a hospital) and it is inconsistent in parts.

3.9 Paragraph 1.7 of PPP8 then includes a copy of Table A1 of Appendix 1 to the SHTM 03-01.

3.10 SHTM 03-01 contains a summary of recommendations in Table A1. The Inquiry heard evidence that the recommendations in Table A1 are nuanced and are not to be applied blindly. The relevant guidance requires to be considered as a whole system approach that is part of a quality-controlled briefing process that involves an informed client, engagement with clinicians and other stakeholders, relevant expert input, engineering judgement applied in dialogue with clinicians having identified the clinical function and use of the relevant spaces with the particular patient cohort in mind.

3.11 The context and the use of Table A1 in SHTM 03-01 was addressed in Ms Susan Grant's witness statement to the Inquiry. Ms Grant explained that Table A1 provided users with an aid-memoire but it should not be considered as a sole source of data for briefing and design. Table A1 should be read in conjunction, not only with the whole of SHTM 03-01, but also with the rest of NHS Guidance relevant to each project. In Ms Grant's experience Table A1 was often seen as the easy go-to place to find information with elements taken out of context or alternative interpretations placed on a specific clause, table, parameter or value.

3.12 The recommendations in Table A1 require to be approached and handled with some caution, therefore. The recommendations in Table A1 are nuanced (not to be applied blindly) and require to be considered in light of the clinical activity taking place in the space and in consultation with the relevant stakeholders. Care needs to be taken not to oversimplify the recommendations in Table A1.

Paragraphs 1.4, 1.9 – 1.12

3.13 In light of the comments above in relation to Table A1, it cannot be assumed that a variance from the SHTM 03-01 or Table A1 is necessarily a 'discrepancy' in the ordinary meaning of the word. The Inquiry has heard evidence that departures from that guidance is not unusual and the Inquiry has heard evidence that there can be "100s" of derogations on a project.

3.14 Paragraph 1.4 of PPP8 states that the "*Inquiry understand that the Environmental Matrix contained 'discrepancies', where the parameters for ventilation it contained differed from those recommended in STHM 03-01….*" IHSL notes that "*these are examined not for the purposes of determining the respective rights and obligations of the parties but to enable the Inquiry to fulfil its terms of reference*."

3.15 The Inquiry Team states at paragraph 1.9 that it is the Inquiry's provisional understanding that the primary cause of the delay to the opening of the RHCYP/DCN was a non-compliance with the air change rates recommended for those Critical Care areas. IHSL's understanding is that the primary cause of the delay to the opening was a non-compliance with the air change rates recommended for those Critical Care areas and a non-compliance with the pressure regime recommended for those Critical Care areas (which recommended +10 Pa). The Change to the Works subsequently instructed by NHSL under High Value Change Notice 107 not only involved increasing the air change rates to 10 ac/hr in the Critical Care rooms but also changing the pressure regime from balanced or negative relative to the adjacent corridor to positive relative to the adjacent corridor. NHSL also took the opportunity to instruct further changes during the period of delayed opening (e.g. to redesign elements of the CAMHS areas, changes to ventilation in Haematology and Oncology and to enhance fire protection).

3.16 The Inquiry Team clarifies at Paragraph 1.9 that the term 'non-compliance' used in PPP8 means "*non-compliance with the published guidance SHTM 03-01"* and should not be interpreted as suggesting any non-compliance with contractual requirements. Even in this more specific and narrow sense the term "non-compliance" could carry with it an implied expectation of "compliance" (which as noted above and in IHSL's Closing Submission to the April/May 2023 hearing is not a straightforward matter). Nevertheless, whilst IHSL has concerns with the term "non-compliance", IHSL adopts the Inquiry Team's specific and narrow definition of the term for the purposes of this Response in so far as it means that the Environmental Matrix and agreed resolution in SA1 did not reflect the summary in Table A1 of SHTM 03-01.

3.17 Furthermore, paragraph 1.10 states that the "discrepancy" referred to in PPP8 "*represents the non-compliance understood to have caused the delay and is therefore defined as the discrepancy between the air change rate reflected in the EM for the 9 Critical Care rooms and those recommended in SHTM 03-01 for Critical Care areas".*

3.18 IHSL adopts the term "discrepancy" in this Response in so far as the word means a *difference between* (rather than any suggestion of there being a conflict or anomaly).

3.19 As noted above, the "discrepancy" (i.e. the difference) was not just in relation to the air change rates reflected in the 9 Critical Care rooms but also the pressure regime in those rooms. Furthermore, the difference between the air change rate and pressure regime was not just reflected in the Environmental Matrix, it was also reflected in Settlement and Supplemental Agreement 1 dated ("**SA1**"). SA1 resolved and clarified NHSL's requirements for the RHCYP/DCN. In relation to 4 bed

ventilation, the resolution contained within the Technical Schedule to SA1 was that 14 No. 4 bed rooms were to be balanced or negative to the corridor at 4 ac/hr. The 14 No. 4 bed rooms included 4 which were in within Critical Care. SA1 also resolved the issues in relation to the single bedrooms.

3.20 It may be said, therefore, that the "discrepancy" could be described as the difference (taken objectively) between the air change rate and pressure regime set out in the Environmental Matrix and as resolved and agreed by SA1 (against which Practical Completion was measured against) and those recommended in Table A1 of STHM 03-01.

3.21 The Inquiry Team rightly acknowledges at paragraph 1.12 of PPP8 that the issues of whether there was a "discrepancy" and whether that discrepancy amounted to an error are controversial. For the purposes of this Response, IHSL proceeds on the basis that there was a difference between the air change rate and pressure regime set out in the Environmental Matrix and resolved and agreed by SA1 and those recommended in Table A1 of STHM 03-01.

Paragraph 1.11 – purpose of PPP8

3.22 Paragraph 1.11 states that the purpose of PPP8 is to consider: *(1) whether this discrepancy could have been detected sooner than it was, and as a consequence, (2) whether the delay could have been avoided, or decided upon sooner,* ***thereby avoiding the consequence of a last minute change to plans for moving staff and patients to the new hospital****."* (emphasis added)

3.23 In relation to limb (i), IHSL has some reservations with the reference to whether the discrepancy "*could have been detected"* sooner than it was, because this carries with it an implication that the issue was somehow hidden from view and required to be uncovered. It might also imply that there was a lack of awareness of what the ventilation requirements were in the Environmental Matrix and SA1. On the contrary, the requirements for ventilation in the Critical Care areas contained in SA1 were expressed and in plain sight. What IHSL understands the Inquiry Team to mean here is whether there were opportunities whereby the difference between the requirements in the Environmental Matrix and subsequently SA1 and the recommendations in Table A1 could have been highlighted or questioned.

3.24 In relation to limb (ii), IHSL wish to highlight to the Inquiry Team that following the issue of the Institute of Occupation Medicine's ("**IOM**") reports (in late June/early July 2019), NHSL, IHSL and MPX agreed upon a temporary solution for the Critical Care areas which would have allowed the RHCYP/DCN to open and the transfer of patients to commence.

3.25 Following an all-party meeting which took place on 2 July 2019 (which included representatives from NHSL's infection control team, IHSL's project team and senior NHSL board members) consensus was reached on an interim solution to be implemented for increasing ventilation in Critical Care. NHSL issued a request to IHSL and MPX by e-mail dated 3 July 2019 requesting IHSL and, in turn, MPX to proceed with adjusting the installed ventilation system in critical care to achieve air change

rates, adopting what was Option A in the schedule attached to NHSL's e-mail. The request was for IHSL and, in turn, MPX to provide as a minimum 7 air changes/hour in all single bedrooms (with the exception of room 1 B1 037) and 5 air changes/hour in all four bedded rooms (with the exception of room 1 B1 063).

3.26 The e-mail from NHSL dated 3 July 2019 records that IHSL and, in turn, MPX had intimated that MPX would commence the necessary activities on Thursday 4 July 2019 and anticipated completion on Saturday 6 July 2019 at which point the air change rates in the relevant Critical Care rooms would achieve the air change rates as per Option A of the schedule attached to the e-mail. IHSL would suggest to the Inquiry that a question to address at the hearing scheduled to commence in February 2024 is whether the ventilation performance requirements contained in the interim solution met or exceeded the room environmental conditions in the existing hospital at that time.

3.27 Whilst some issues around the instruction from NHSL remained to be agreed upon, the instruction from NHSL reflected a short-term solution that NHSL was content to instruct IHSL and MPX to carry out which would have allowed the RHCYP/DCN to open. That is, there was a short-term plan being put in place that would have avoided the "*last-minute change to plans*" referred to in paragraph 1.11 of PPP8.

3.28 A copy of NHSL's e-mail dated 3 July 2019 is appended to this Response.

3.29 The Scottish Government's Cabinet Secretary for Health and Sport announced her decision to delay opening of the RHCP/DCN on 4 July 2019. IHSL was neither party to that decision nor was it aware of the basis upon which that decision was taken.

Paragraph 1.15 – missed opportunity

3.30 Paragraph 1.15 of PPP8 defines a "missed opportunity" as "*any occasion where a different course of action had the potential to produce a more favourable outcome; that is, the occasions where decisions or actions (taken or not taken) failed to detect the discrepancy when they conceivably could or should have."*

3.31 As noted above, IHSL takes the reference to "*failed to detect*" the discrepancy as meaning an opportunity where the difference could have been highlighted. The exercise of identifying missed opportunities necessarily involves a degree of speculation and review of events which IHSL may not have been party to or not be aware of their proper context. IHSL has sought to avoid speculation in this Response as far as possible.

4. SECTION 2 – 'GOVERNANCE AND PROJECT MANAGEMENT'

4.1 IHSL has no comments to make on Section 2 of PPP8 – this largely addresses matters which are outside IHSL's knowledge.

4.2 The Inquiry Team is referred to IHSL's previous submission dated 22 July 2021 for further detail of the meeting groups and communication/reporting structure in place during the relevant time periods for the Project.

5. **SECTION 3 – 'TIMELINE OF THE CONSTRUCTION PHASE'**

5.1 The Inquiry Team has produced a helpful graphic of the construction phase timeline in Section 3 of PPP8 which IHSL broadly accepts.

5.2 IHSL notes the entry in the graphic in March 2018 which states that "*DRP avoided, commercial settlement agreement pursued*". Whilst that is correct, it does omit reference to the draft Court summons which was issued by NHSL to IHSL on 21 March 2018 under the threat of commencement of legal proceedings being raised against IHSL the following day. This draft summons was supported by Affidavits provided by NHSL's Project Clinical Director, Janice McKenzie, and Graeme Greer of Mott MacDonald Limited ("**MML**").

5.3 The draft Court summons is significant in IHSL's view, particularly in the context of identifying missed opportunities for identifying a difference between NHSL's requirements and the guidance in Table A1. The draft Court summons specified NHSL's requirement that all four-bed rooms in the RHCYP/DCN must have a pressure regime which was balanced or negative relative to the adjoining space. Those four-bed rooms included three rooms which were located in Critical Care (1-B1-063, 1-B1-031 and 1-B1-009). The fourth multi-bed room in Critical Care (1-B1-065) had already been designed with balanced/negative pressure relative to the adjoining space.

5.4 NHSL argued that its requirement that four-bed rooms (including those in Critical Care) have a pressure regime which was balanced or negative to the adjoining space was supported by Good Industry Practice, NHSL's own view of the Project Agreement requirements, independent expert advice (from David Rollason) and Senior Counsel's Opinion.

5.5 NHSL was prepared it seemed to raise Court proceedings against IHSL seeking orders compelling IHSL to design the four-bed rooms in Critical Care with a pressure regime which was balanced or negative to the adjoining corridor. NHSL's priority, it appeared, was the ability to safely cohort patients. And yet, the guidance in Table A1 of SHTM 03-01 recommends that Critical Care areas have a Positive pressure regime relative to the adjacent corridor. The guidance in Table A1 for the pressure regime in Critical Care areas (+10Pa) is precisely the opposite to the requirement advanced by NHSL for the four-bed rooms in Critical Care (and which NHSL would have sought Court orders compelling IHSL to design).

5.6 The four-bed rooms in Critical Care were ultimately designed and constructed with a pressure regime which was negative or balanced to the adjoining corridor pursuant to the terms of SA1. In June 2019, however, the IOM's position was that those rooms in Critical Care should have Positive pressure relative to the adjacent corridor in line with Table A1.

5.7 IHSL does not know whether or not NHSL was aware that its own requirement for the pressure regime in the four-bed rooms in Critical Care (i.e. that they have a pressure regime which was negative or balanced to the adjoining corridor) did not meet the guidance in Table A1 of SHTM 03-01. Given the scrutiny that must have been given to the ventilation design in preparation of raising court proceedings, it would appear to IHSL that this presented a missed opportunity for NHSL to have highlighted that there was a difference between its requirement for the pressure regime in the 4-bed rooms in Critical Care and the recommendation in Table A1.

5.8 Notably, the draft Court summons was silent on the air change rates in the four-bed rooms in Critical Care (it only addressed the pressure regime). As noted above, IHSL is careful to avoid speculation in this Response, but nevertheless this would tend to suggest (in IHSL's view) that the issue of air change rates in those 4-bed rooms in Critical Care was not in issue (i.e. there was no need for a Court order addressing the issue of air change rates as there was consensus at that date). As at March 2018, it was clear from the various iterations of the Environmental Matrix, the internal documents prepared by NHSL (e.g. the 4-bed room tracker) and the external advice sought by NHSL from David Rollason that the parties understood that the air change rate in the multi-bed rooms was 4 ac/hr. The draft Court summons did not seek to challenge that position or seek an order imposing a different requirement.

5.9 The graphic timeline in Section 3 of PPP8 notes that in January 2019 "*IHSL/NHSL confirm to DG Health & Social Care that RHCYP ventilation complies with SHTM 03-01."* IHSL is not clear what the relevance of this entry is in relation to the construction timeline or to the matters addressed in PPP8. IHSL has set out more detailed comments on this correspondence in its Response to PPP6 (Section 7). In brief summary, NHSL's letter to IHSL (which was issued to IHSL prior to completion of the Project) attached a copy of the Chief Executive's letter dated 25 January 2019. The Chief Executive's letter requested confirmation that critical ventilation systems were <u>inspected and maintained</u> in line with SHTM 03-01. SHTM 03-01 is published in two parts: Part A deals with the design and installation of ventilation systems; Part B covers operational management. The Chief Executive's Letter addressed matters relating to inspection and maintenance captured by Part B of SHTM 03-01: it did not relate to the design of ventilation which is captured by Part A of SHTM 03-01. On receipt of the copy of Chief Executive's Letter, IHSL, in turn, issued the letter to MPX and BYES and received responses from both parties. Upon receipt of MPX's and BYES's letters, IHSL then responded to NHSL. IHSL did not respond to "DG Health & Social Care" as the timeline might imply: IHSL responded only to NHSL. IHSL does not know what actions NHSL took upon receiving IHSL's letter dated 31 January 2019.

6. SECTION 4 – 'THE RDD REVIEW PROCEDURE'

6.1 IHSL is unable to comment on much of Section 4 as it largely addresses matters which are outside IHSL's knowledge.

6.2 Whilst the Review Procedure for RDD is an iterative process of review and sign off, it is a process for essentially developing the detail of what's already been agreed at Financial Close. As noted at paragraph 3.4 above, at Financial Close the construction costs for the Project become fixed as do IHSL's quantum and costs of borrowing. The Reviewable Design Data review procedure does not envisage that the design development will lead to significant cost changes or time delays.

6.3 IHSL is unable to comment on the extent to which the Reviewable Design Data review procedure may have presented opportunities to highlight the difference between the Environmental Matrix and Table A1.

6.4 What does appear to IHSL to have been a missed opportunity to highlight a difference between the ventilation requirements for Critical Care and Table A1 was the occurrence in February 2017 when NHSL identified the parameters contained in the Environmental Matrix for neutropenic patients. Paragraph 9.6.27 of PPP8 narrates the e-mail correspondence between Dorothy Hanley (the Project Manager, Children's Services Lead), Brian Currie (Project Director) and Ronnie Henderson in February 2017. Ms Hanley had noticed that a neutropenic patient area should have had a different air change from other types of wards. In the e-mail correspondence between Mr Currie and MML, MML refer to SHTM 03-01 and state that Neutropenic Patient Ward requires 10 ac/hr and +10 pressure (the same ventilation requirements recommended in Table A1 for Critical Care areas). MML state that: "*There are 17 bedrooms, 15 single and 2 multi-bed areas in haematology and oncology ward.* ***The latest environmental matrix (attached) suggests the same design parameters as any other single/multibed areas i.e. 4 ac/hr and balanced/negative pressure****."* (emphasis added)

6.5 Paragraph 9.6.30 of PPP8 refers to further correspondence from MML which states that "*SHTM have clear design guidance for neutropenic patient ward. The environmental matrix suggests the same design principles as adopted anywhere else in the Facility which is not in line with BCRs/SHTMs for this department.*"

6.6 The MML e-mail correspondence appears to identify the different recommendations in Table A1 for neutropenic patient wards whereas the Environmental Matrix suggests the same design parameters for those areas as any other single or multi-bed areas. Given the other single or multi-bed areas would have included rooms in Critical Care, this might have presented an opportunity to highlight that there were other specialist areas where Table A1 recommended different requirements.

6.7 It is noteworthy that at paragraph 9.6.28 of PPP8, the Inquiry Team quotes an e-mail from the Project Director in response to Ms Hanley's e-mail stating that "*if we have not already stated our requirements (environmental matrix etc.) we need to do it now. Suggest we cross check what has been communicated to IHSL already."* This illustrates that as late as February 2017 NHSL had still not fully understood, finalised and communicated its ventilation requirements.

6.8 At paragraph 4.20, the Inquiry has invited views from CPs on whether the RDD review process is appropriate to finalise the design of critical care ventilation systems in clinical care areas. This is perhaps a query which is better responded to by those parties most directly involved in the RDD process (i.e. MPX and its design sub-consultant, Wallace Whittle/TUV SUD).

6.9 That said, it was evident that the RDD review process was challenging during the Project because NHSL did not have a clear and concluded view of its room requirements either prior to or following Financial Close. Notwithstanding that the Environmental Matrix issued with the Invitation to Participate in Dialogue documents and the Invitation to Submit Final Tender documents was described as setting out NHSL's room requirements it was apparent that NHSL had not reached a settled view on its requirements (examples being the lack of understanding of how the guidance applied to 4-bed rooms or the realisation that ventilation requirements were different for neutropenic patient wards). NHSL had spent considerable time and cost in the reference design phase formulating its requirements and obtained an assurance from the reference design team that the reference design (including the Environmental Matrix) complied with the relevant guidance. But yet the queries from NHSL on the iterations of the Environmental Matrix included questions of compliance with SHTMs.

6.10 The RDD review process may not be an appropriate one where the authority's requirements are not settled or where the authority relies upon compliance with the relevant guidance as being a relevant brief. The guidance is open to differing interpretations. The RDD process is not the appropriate procedure for the authority to develop and conclude its requirements for ventilation or to try and resolve those competing interpretations of the guidance as those changes can lead to significant cost and risk impact.

7. SECTION 5 – 'MULTI-BED ROOM DISPUTE'

7.1 As the Inquiry Team identify in Section of PPP8, a dispute developed between NHSL and IHSL (and, in turn, MPX) regarding the ventilation requirements in the multi-bed rooms. The dispute concerned the pressure regime for the multi-bed rooms. The Environmental Matrix stated that the pressure regime was positive to the adjacent corridor whereas NHSL insisted that all multi-bed rooms (wherever they were located) required a pressure regime which was balanced or negative relative to the adjacent corridor. This was ostensibly to allow patient cohorting.

7.2 The genesis of the issue appears to be NHSL's request to HFS for its interpretation for the ventilation pressure requirements in four bed wards in June 2016. NHSL's request is addressed in more detail at paragraphs 9.4.22 and 9.4.23 of PPP8. The Inquiry has also provided a copy of HFS's response in the Supporting Documentation to PPP8. The response provided by HFS states that it has been asked the following question by NHSL: "*What is Health Facilities Scotland's interpretation of the ventilation pressure requirements for four bed wards?"*

7.3 HFS's response is contained in the following extract:

2.5. What is Health Facilities Scotland's interpretation of the ventilation pressure requirements for four bed wards?

- SHTM 03-01 Part A, Appendix 1, Table A indicates the air change rates and pressure regime for clinical areas within healthcare premises. There is no four bed ward noted

in Table A, however it would not be unreasonable to treat this area as one would a single bed ward with respect to ventilation as the measures for infection control would be the same. Therefore the room should be neutral or slightly negative with respect to the corridor.

- SHTM 03-01 Part A clause 1.35 et al details the Management Action with Clause 1.37 highlighting the need to seek guidance from Clinical colleagues.
- SHTM 03-01 Part A clause 1.39 et al details the Design and validation process. Table 2 highlights the model to be followed and item 2 outlines some the design questions to be asked and resolved.

7.4 This response from HFS does not recognise that the ventilation requirements may vary for multi-bed rooms or 4-bed rooms depending on where those rooms are located (e.g. in Critical Care or neutropenic patient wards where the pressure regime is recommended in Table A1 as being +10 Pa relative to the adjacent corridor). This advice from HFS appears to be at the root of NHSL's subsequent insistence that all multi-bed rooms required a balanced or negative pressure relative to the adjacent corridor.

7.5 Nevertheless, this seems to IHSL to be a significant missed opportunity to have identified that the recommendation for ventilation pressure in Table A1 differed depending on where those rooms were located. It is noteworthy that each bullet point of HFS's response refers to STHM 03-01 Part A, with the first bullet point specifically referring to Table A in Appendix 1.

7.6 It is significant to note that as late as June 2016 (some 16 months after construction commenced) NHSL did not have a clear understanding of the application of the guidance to 4-bed rooms. This further highlights the ambiguities around the guidance and the scope for differing interpretations.

7.7 Paragraph 5.6 of PPP8 states that ventilation workshops were held in early 2017 and over the course of five months various iterations of a '*Multi-bed room – Ventilation amendment proposal to achieve room balance'* was under review by Project Co (which IHSL understands to be a reference more accurately to MPX), MML and NHSL. As the Inquiry Team notes, the ventilation design in the multi-bed rooms, including those in Critical Care, was considered in detail.

7.8 Paragraph 5.9 of PPP8 refers to the "general risk assessment" conducted by NHSL which considered the risk of the proposed positive pressure regime for 4-bed rooms on various departments in the

hospital, including those in Critical Care. However, the risk assessment did not identify the different requirements for bedrooms in Critical Care areas outlined in SHTM 03-01. For example, it failed to note that a positive pressure regime was in fact recommended for Critical Care areas.

7.9 The other significant missed opportunity to identify the difference between NHSL's requirements for the ventilation pressure in the multi-bed rooms and SHTM 03-01 Table A1 in this period occurred in late 2017 when NHSL sought independent expert advice from David Rollason.

7.10 Paragraph 1.3 of Mr Rollason's report states that with regards to pressure regimes, NHSL believed that Project Co's proposed ventilation design for the 20 4-bed rooms did not comply with the Board's Construction Requirements, Project Co's Proposals and guidance in SHTMs. Mr Rollason also stated at paragraph 1.3 of his report that he understood that NHSL "*may also have concerns regarding Project Co's proposed air change rates, but this is not an issue upon which I have been asked to comment at this stage."* IHSL is not aware of what those concerns regarding proposed air change rates were.

7.11 At paragraph 2.1 of his report, Mr Rollason states as follows:

> *"It is evident from the schedule of design data extracted from various revisions of IHSL's Environmental Matrix (EM)… that Project Co's proposed ventilation design for the 4-bed rooms includes:*
>
> *(i)* ***mechanical supply to the 20 4-bed rooms at a rate of 4ac/hr*** *(based on the room volume of the 4-bed rooms);*
>
> *(ii)* ***mechanical extract from the four 4-bed rooms (1-B1-009, 1-B1-031, 1-B1-063 and 1-B1-065)*** *which do not have adjacent en-suites/accessible WCs/wet rooms, at rates of 1.7 to 4 ac/hr….."* (emphasis added)

7.12 Significantly, Mr Rollason identifies that the revisions of the Environmental Matrix included mechanical supply to all 20 4-bed rooms at a rate of 4 ac/hr and goes on to specifically reference the four 4-bed rooms in the Critical Care areas (i.e. those rooms emphasised in bold above) albeit in the context of mechanical extract (not supply). Nevertheless, the connection is made that the four 4-bed rooms in Critical Care have a mechanical supply at a rate of 4 ac/hr.

7.13 At paragraph 2.2 of his report, Mr Rollason states:

> "*These characteristics of Project Co's proposed design result in:*
>
> *(i)one of the 4 bed-rooms (1-B1-065) being balanced pressure relative to the adjacent ward corridor; and*

(ii) the remaining 19 4-bed rooms being positive pressure relative to the adjacent ward corridor.

7.14 Mr Rollason's opinion was that it was Good Industry Practice to provide balanced/negative pressure in 4-bed rooms relative to the adjacent corridor (paragraph 3.3.6 of his report) and that "*such Good Industry Practice to ensure inter alia infection control requires the pressure in multi-bed rooms to be balanced or negative relative to the adjacent space*" (paragraph 3.7). No recognition is given or distinction made in respect of multi-bed rooms in Critical Care areas which Table A1 recommends should have positive pressure relative to the adjacent corridor. Having already specifically referenced the four 4-bed rooms in the Critical Care areas, Mr Rollason fails to identify that Table A1 contained different recommendations for rooms in those areas in respect of pressure regimes (and air change rates). Whilst Mr Rollason's view was that Good Industry Practice required the pressure in multi-bed rooms to be balanced or negative to the adjacent space, this was contrary to the guidance in Table A1 which was that rooms in those areas should be positive pressure relative to the adjacent corridor.

7.15 Mr Rollason's opinion (paragraph 3.10 of his report) was that Project Co was required to provide balanced/negative pressure in the 4-bed rooms relative to the adjacent ward corridors. That, he said, was "*consistent with what I would normally expect, as providing a balanced/negative pressured in the 4-bed rooms inhibits the spread of infection from patients in the 4-bed rooms to adjacent areas."* Project Co' proposed ventilation design for the 4-bed rooms he said, on the other hand, "*does not comply with the relevant contractual provisions because Project Co's design provides positive (not balanced/negative) pressure in 19 of the 20 4-bed rooms relative to the adjacent ward corridors)"*. This was his opinion notwithstanding the fact that four of the 4-bed rooms were located in Critical Care and in respect of those areas Table A1 recommends positive pressure.

7.16 Paragraph 5.17 of PPP8 refers to a '4-bed room tracker' which was produced to assist NHSL in negotiations with Project Co. The Inquiry Team states that this document explicitly showed the ventilation parameters provided for multi-bed rooms in Critical Care areas, including that the air change rate was 4 ac/hr. NHSL's own internal documents demonstrated its awareness that the air change rate to the multi-bed rooms in Critical Care was 4 ac/hr.

7.17 Paragraph 5.15 of PPP8 refers to the view given by the Independent Tester in relation to the multi-bed room ventilation dispute. Paragraph 5.15 alludes to certain provisions of the Project Agreement and the Board's Construction Requirements relied upon by the Independent Tester: IHSL understands the Inquiry Team to be alluding to the hierarchy of standards provisions contained in paragraph 2.5 of the Board's Construction Requirements. IHSL has previously identified to the Inquiry that the contract interpretation of those provisions is disputed between the parties. IHSL refers the Inquiry Team to paragraph 5.84 of IHSL's Response to PPP4. Paragraph 2.5 of the Board Construction Requirements is concerned with any contradictions in the "standards/advice" apparent in the Board's Construction Requirements i.e. those publications referred to in the preceding paragraphs of the Board's Construction Requirements (e.g. the raft of NHS standards referred to in

paragraphs 2.3 and 2.4 of the Boards' Construction Requirements). Paragraph 2.5 is not relevant to any conflicts between (i) published guidance and a specific requirement laid down by the Board (because the relevant provisions of the Project Agreement state that the guidance in HTMs/SHTMs give way to any specific requirement of the Board) or (ii) specific requirements of the Board.

8. **SECTION 6 – 'SETTLEMENT AGREEMENT 1'**

8.1 The Inquiry Team addresses SA1 in Section 6 of PPP8.

8.2 SA1 resolved a number of disputed issues regarding ventilation which had arisen during the course of the Project. These included disputed issues relating to: (i) the mixed mode ventilation in single bedrooms (6 ac/hr being achieved by mechanical ventilation and natural ventilation rather than solely through mechanical supply); (ii) the ventilation pressure regime in the multi-bed rooms; and (iii) the bedroom ventilation pressure regime and air change rate in rooms for neutropenic patients.

8.3 The solutions to those disputed issues had already been implemented by MPX by the date that SA1 was signed in February 2019. This included the works in relation to the ventilation pressure regime in the multi-bed rooms in Critical Care.

8.4 In around March 2018, when the DRP had been avoided (and the threat of legal proceedings removed) and parties pursued a commercial settlement agreement, NHSL, IHSL and MPX discussed different options for the ventilation works. It was agreed that 14 No 4-bed wards were to have an air change rate at 4 ac/hr at a negative or balanced pressure. This technical solution was agreed upon in advance of MPX carrying out those works. Due to a number of other issues delaying finalisation of a commercial settlement agreement, MPX carried out the agreed technical solution to the multi-bed ward ventilation pressure regime at its own risk whilst finalisation of the commercial settlement agreement was completed. Those ventilation pressure regime works to the multi-bed rooms had been completed by the date that SA1 was executed.

8.5 SA1 supplemented and amended the requirements of the Project Agreement. SA1 resolved and clarified NHSL's requirements for the RHCYP/DCN. In relation to 4 bed ventilation, the resolution contained within the Technical Schedule to SA1 (and which had already been carried out and completed) was that 14 No. 4 bed rooms were to be balanced or negative to the corridor at 4 ac/hr. The 14 No. 4 bed rooms included 4 which were within Critical Care.

8.6 IHSL and its main contractor, MPX, delivered the hospital which was specified by NHSL as per SA1. This was signed off by the Independent Tester and a Certificate of Practical Completion was issued on 22 February 2019.

9. **SECTION 7 – 'PROVISIONAL CONCLUSIONS'**

9.1 Many of the Inquiry Team's provisional conclusions are outside IHSL's own knowledge. In so far as they are within IHSL's knowledge, IHSL broadly agrees with the provisional conclusions.

10. **SECTION 8 – 'QUESTIONS'**

10.1 IHSL notes that the questions in Section 8 are largely addressed to, or best placed to be answered by, other CPs (e.g. NHSL or MPX).

10.2 Subject to the comments made in this Response and in so far as the matters within PPP8 are within IHSL's own knowledge, IHSL broadly agrees with the provisional findings and conclusions in PPP8.

11. **SECTION 9 – 'NARRATIVE'**

11.1 The Inquiry Team has provided a narrative describing the review of the Environmental Matrix during the RDD process, the discovery of further issues with the ventilation system than those that had initially been identified at Financial Close, and the steps taken to address these issues in Section 9 of PPP8.

11.2 IHSL was not directly involved in the preparation of the various iterations of the Environmental Matrix (that being a matter for MPX and its design sub-consultants, Wallace Whittle (subsequently TUV Sud)) or the review of the versions of the Environmental Matrix through the RDD review process (that being a matter for NHSL and MML).

11.3 IHSL is limited therefore in the comments which it is able to make on Section 9 of PPP8.

11.4 The Inquiry Team defines what is meant by a "*missed opportunity*". This is defined as "*any occasion where a different course of action had the potential to produce a more favourable outcome; that is, the occasions where decisions or actions (taken or not taken) by NHSL, MML or Project Co failed to detect the discrepancy when they conceivably could or should have."*

11.5 As noted above, IHSL adopts the term "discrepancy" in this Response in so far as the word means a *difference between* (rather than any suggestion of there being a conflict or anomaly).

11.6 As noted above, the "discrepancy" (i.e. the difference) was not just in relation to the air change rates reflected in the 9 Critical Care rooms but also the pressure regime in those rooms. Furthermore, the difference between the air change rate and pressure regime was not just reflected in the Environmental Matrix, it was also reflected in SA1. SA1 resolved and clarified NHSL's requirements for the RHCYP/DCN. In relation to 4-bed room ventilation, the resolution contained within the Technical Schedule to SA1 was that 14 No. 4 bed rooms were to be balanced or negative to the corridor at 4 ac/hr. The 14 No. 4 bed rooms included 4 which were in Critical Care.

11.7 It may be said, therefore, that the "discrepancy" could be described as the difference (taken objectively) between the air change rate and pressure regime set out in the Environmental Matrix and as resolved and agreed by SA1 (against which Practical Completion was measured against) and those recommended in Table A1 of STHM 03-01.

11.8 IHSL has some concerns with the reference in the definition of "*missed opportunity*" to occasions where decisions or actions by NHSL, MML, Project Co or MPX "*failed to detect"* the discrepancy (i.e. between what was agreed and the recommendations in Table A1). A "failure to detect" implies that the issue was somehow hidden from view and required to be uncovered. It might also imply that there was a lack of awareness of what the ventilation requirements were. On the contrary, the requirements for ventilation in the Critical Care areas contained in SA1 were expressed and agreed upon. What IHSL understands the Inquiry Team to mean here is whether there were opportunities whereby the difference between the requirements in the Environmental Matrix and what was ultimately agreed upon in SA1 and the recommendations in Table A1 could have been highlighted or questioned.

11.9 At paragraphs 9.4.22 and 9.4.23 of PPP8, the Inquiry Team refers to the opinion requested by NHSL from HFS in relation to the ventilation pressure requirements for the 4-bed rooms in June 2016. The Inquiry has also provided a copy of HFS's response in the Supporting Documentation to PPP8.

11.10 Reference is made to the comments made above at paragraphs 7.2 to 7.6 to the response from HFS and the potential missed opportunity to identify that the pressure regimes in 4-bed rooms may differ depending on where they are located.

11.11 A further missed opportunity appears to have occurred in February 2017 when it was highlighted that the neutropenic patient area should have a different air change rate from other types of wards. Reference is made to the comments made at paragraphs 6.4 to 6.7 above.

Paragraph 9.10 – Settlement Agreement Negotiations

11.12 Paragraph 9.10.2 of PPP8 refers to the independent expert report prepared by David Rollason. This appears to IHSL to be a missed opportunity to identify that the pressure regime for the multi-bed wards depended on the location of those rooms (i.e. the guidance in Table A1 of SHTM 03-01 for the pressure in regime for 4-bed rooms in Critical Care areas would be different to those rooms located elsewhere). Reference is made to the comments made at paragraphs 7.9 to 7.15 above.

11.13 Paragraph 9.10.29 of PPP8 refers to the first 'Project Technical Management Group meeting' which was held on 4 April 2018. Paragraph 9.10.31 states with reference to the 4-bed ventilation issue: "*14 rooms at 4 ac/hr confirmed. Room numbers to be confirmed and updated on drawings. (MPX)".*

11.14 Paragraph 9.10.33 of PPP8 notes that by 5 July 2018, resolutions to three ventilation disputes (i.e. the bedroom ventilation for neutropenic patients, the 4-bed ventilation issue and the single bedroom ventilation issue) had been agreed in an early draft 'Technical Schedule' and the items were noted as being closed.

11.15 Paragraph 9.10.35 of PPP8 states that the agreed technical solution in the four Critical Care multi-bed rooms (without en-suites) was to: "*Retain the supply ventilation at 4 ac/hr….."*

Paragraph 9.11 – the letter from DG Health & Social Care

11.16 Reference is made to IHSL's Response to PPP6 (at Section 7) which addresses the January 2019 correspondence between IHSL and NHSL (and summarised at paragraph 5.9 above).

Paragraph 9.12 – Settlement Agreement

11.17 Reference is made to the comments at paragraphs 8.1 to 8.6 above.

Paragraph 9.13 – After Handover

11.18 IHSL is unable to provide comments on this paragraph in PPP8 as these matters are outside of IHSL's knowledge.

9 October 2023

SCOTTISH HOSPITALS INQUIRY

RESPONSE TO PROVISIONAL POSITION PAPER 8 OF THE INQUIRY

ON BEHALF OF

GREATER GLASGOW HEALTH BOARD

1. Greater Glasgow Health Board ('NHSGGC') welcomes the opportunity to comment on Provisional Position Paper 8 ('PPP8') of the Inquiry. NHSGGC notes that PPP8 is directed at the ventilation design development for the Royal Hospital for Children and Young People and Department for Clinical Neurosciences, Edinburgh ("RHCYP/DCN"). NHSGGC makes no comment on the content of PPP8 which specifically concerns the RHCYP/DCN.

2. PPP8 addresses the relationship between the SHTM 03-01 guidance and the RHCYP/DCN contractual documentation. The Inquiry is yet to hear any evidence on the QEUH/RHC project documentation. It is not possible to draw any conclusions as to the status of the guidance, its applicability, or its interpretation in relation to the QEUH/RHC without putting that guidance into the context of the hierarchy of contractual documentation.

3. NHSGGC notes that reference is made at paragraph 9.10.41 of PPP8 to a PowerPoint presentation dated 6 September 2018 prepared by HFS in relation to the QEUH/RHC project. The Inquiry has not indicated whether anyone from NHSGGC was present at this presentation, nor whether a copy of the presentation was subsequently provided to NHSGGC. NHSGCC is not familiar with the contents of the PowerPoint presentation, nor the context in which it was given. NHSGGC does not consider that the criticisms of the QEUH/RHC project set out in that PowerPoint are valid. The Inquiry is yet to hear any evidence in respect of the design, build, commissioning, validation, operation and maintenance of the ventilation system at QEUH/RHC. The Inquiry must hear evidence, including technical and expert evidence, in order to determine whether any criticism is justified.

4. NHSGGC welcomes the opportunity to address these points at a future hearing.

SCOTTISH HOSPITALS INQUIRY

Hearing Commencing 26 February 2024

Bundle 12 – Substantive Core Participant responses to Provisional Position Papers – Volume 1 (of 3)

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