

Scottish Hospitals Inquiry

Witness Statement of

Darren Pike

Witness Details

1. My name is Darren Michael Pike. I am currently employed as a Project Director at Multiplex Construction (Europe) Limited ("Multiplex"). I have worked at Multiplex for approximately 14 years, first as a Project Mechanical and Electrical Engineering ("M&E") Manager. I then became a Project Director from around January 2016.
2. Prior to joining Multiplex, I worked for Balfour Beatty Engineering Services (formerly Haden Young) for approximately 13 years and was a Preconstruction Manager for healthcare in that business. I graduated from Strathclyde University in 1997 with a degree in Mechanical Engineering. I started as a Mechanical Project Engineer and then became a Project Manager. I then worked on the Design and Build side before then becoming a pre-construction manager in 2009, before then joining Multiplex.

Background

3. I worked on the Royal Hospital for Sick Children ("RHSC") project ("the Project") from April 2015 until practical completion was certified in February 2019. When I joined, the Project was in the early phases after Financial Close. Multiplex were employed by IHS Lothian Limited ("IHSL"), which was a Special Purpose Vehicle ("SPV") company, also referred to as "Project Co", set up specifically for the Project. They were in turn employed by the health board, NHS Lothian ("the Board") to deliver the Project.
4. From April 2015 to December 2016, I attended various meetings to develop the relationship with the Board and IHSL, then from January 2016 onwards I

became Multiplex's Project Director on the Project. The role of a Project Director is to oversee the delivery of the contract, which included managing the Multiplex team but also liaising with our contract partners and other stakeholders. I liaised regularly with IHSL and with the Board as part of that.

5. I also had regular contact with Wallace Weir (Project Director from IHSL) and with Brian Currie (Project Director from the Board). I had a meeting with both of them most Monday mornings, which was intended to ensure everyone was kept up to date and to allow the respective Project Directors to take direct actions to their teams, if needed to progress matters. Wallace Weir would feed back to IHSL and their funders, and Brian Currie would feed back to the Board and their advisors. These meetings took place from 2016 to 2018.
6. The Board was advised directly by Mott MacDonald ("MM") as well as its own clinical team. I did not have a lot of direct contact with the NHS clinical team and only met them on a couple of occasions. However, my understanding is that they were consulted regularly by the Board. The project team attending meetings on behalf of the Board would rarely make decisions at the meeting itself – the information or proposal was usually taken from the meeting and put before the Board's own advisory team before a decision was made.
7. I oversaw a team of Multiplex individuals reporting to me, each heading up a different discipline area – e.g., Construction, Health and Safety, Commercial, M&E and Architectural. In terms of the M&E design, I wasn't involved in the detailed design but would get reports from the Multiplex team involved. Specific items would then be escalated up and, if needed, I would become more involved.
8. I was not involved in the actual design of the ventilation system; this was carried out by Wallace Whittle. Our Ken Hall (Package Manager) and Colin Grindlay (Lead M & E Manager) would be the liaison between Wallace Whittle, the Board and MM in relation to correspondence. Wallace Whittle would generally lead design meetings discussing directly with MM and the Board, with Multiplex in attendance.

RDD Process

9. There was a design development ("RDD") process with the Board on the Project. The aim of this process was to submit the design information to allow this to be reviewed to ensure it was in line with the Board's Requirements and expectations.
10. From a mechanical, electrical and plumbing ("M&E") point of view there was usually a pre-RDD submission and meeting held for each submission. This ensured everyone had sight of the information and an opportunity to discuss it before it was formally submitted to identify any comments/queries as early as possible.
11. Pre-RDD packs of drawings and specifications were prepared by the design consultants and issued to the Board and their advisors ahead of a specific meeting date. The relevant representatives from each party then attended the pre-RDD meeting, where they raised any comments on the proposed submission. These comments were then taken away, and any agreed changes or alterations were reflected in the drawings for the formal RDD submission. The aim of the pre-RDD meeting was to ensure the design complied with the contract. It also allowed the stakeholders to raise any concerns so that the formal RDD process would go as smoothly as possible.
12. I did not generally attend the pre-RDD meetings, instead the relevant Multiplex team lead would attend and feed back to me as necessary. For M&E ventilation design matters, Ken Hall or Colin Grindlay would usually attend from Multiplex and David Martin (exact position/role unknown) would usually attend as a representative from IHSL. MM would also be present at these meetings. I understand the Board also attended some of the meetings.
13. After the pre-RDD meeting, the formal RDD submission was made. The submission was then reviewed by the Board, the Board's technical advisors and anyone else thought relevant by the Board. The Board would then mark the submission, either status A, B or C.

14. Status A meant that the submission was accepted without any comments and construction/procurement was to proceed in accordance with that design. Status B meant that the submission was accepted subject to comments, and again we were to proceed in accordance with that design. Status C meant that the submission was not approved. We therefore could not proceed with construction or manufacture unless the design submission was returned status A or B.
15. There was an RDD schedule to monitor this process that I would review every month or so with my Multiplex colleagues to ensure that design submissions were being submitted, reviewed and approved according to that schedule. This was to allow us to track the packages so from a programming point of view, we knew the information was being received from the design team, going through pre-RD/RDD and being submitted to then allow us to procure and construct in accordance with the programme.
16. As I understand it, the ventilation design for critical care went through this RDD process and was approved by the Board.

Development of the Environmental Matrix

17. The Environmental Matrix is what the M&E services design consultants use as their design brief, for each space/area on the Project. Meaning Multiplex and our design consultants (Wallace Whittle) would produce the design for M&E elements to achieve the requirements stated in the Environmental Matrix.
18. Amongst other things, the Environmental Matrix specified the required air change rates per hour ("ac/hr"), pressure regimes and ventilation type (i.e., mechanical or natural) that were required for each room or area of the hospital.
19. I was not directly involved in the development of the Environmental Matrix. When I joined the Project, my understanding was that the Environmental Matrix was already in place and Multiplex were completing their design in line

with the matrix. My understanding was that when the Environmental Matrix was then re-submitted for RDD post Financial Close, it would only be reviewed against the comments raised by the Board pre-Financial Close. The Board, however, reviewed the whole document again and produced further comments. This re-review occurred across the whole Project, not just the Environmental Matrix. The Board were effectively doing a further review of what they wanted post Financial Close. Multiplex did not agree with this approach as the contracts had been agreed on the basis of the requirements at Financial Close, but we reviewed the comments and tried to identify which of the new comments/requirements had a cost and/or time impact and which did not. We tried to submit change requests in relation to those with a cost impact to allow them to be discussed with the Board. As far as I can recall there were no significant changes made to the ventilation strategy and requirements.

20. Overall, both the Environmental Matrix, and the underlying design documents which achieved the output shown in the Environmental Matrix, went through the RDD process to allow the Board to ensure they met their requirements. Each of the underlying design documents (being ventilation drawings and grille schedules), were reviewed and approved in the same way as the Environmental Matrix through the RDD process.
21. There were 11 revisions in total of the Environmental Matrix, each of which went through the RDD process.

Single Bedroom Ventilation

22. In relation to the single bedroom ventilation, I was aware that there were discussions in relation to whether or not "derogations" were required. Multiplex's position was that these were not changes to our contract, as the design aligned with the Environmental Matrix; but we were willing to prepare these for the Board as a form of audit to reflect the design. The derogations in question were WW014 (**A46365902 – ANX_EDN000379537 - Bundle 13,**

Volume 2, Page 543) and WW015 (**A46365903 – ANX_EDN000429472 – Bundle 13, Volume 2, Page 544**).

23. Our understanding was that these reflected the agreed position/the Board's Construction Requirements. The Board, however, rejected the derogations.
24. It wasn't clear why the Board were rejecting the derogations. Our view was that we were providing what the contract required and what reflected the Board's requirements that had been agreed at Financial Close.
25. This remained a contractual point of dispute throughout the Project, however (as I explain in more detail below), it was resolved as part of the Settlement Agreement between the parties.
26. Whilst this was a contractual dispute, the technical position was agreed and the design was approved through the RDD process, including 4 ac/hr in the single bedrooms in critical care.

Environmental Matrix Revision 6 and 7

27. In around October 2016, revision 7 of the Environmental Matrix was returned status C (**A46440425 – Appendix 01 - ANX_EDN000088432 – Bundle 13, Volume 1, Page 7**). I recall we questioned how, when the fundamental information in the matrix had not changed, it could be downgraded from a B to a C. At this point Multiplex had already begun to procure and construct in accordance with the Status B Matrix.
28. The Board raised the following comments in their covering email:

“The Board have reviewed the Environmental Matrix and still has significant concerns on items that do not appear to comply with the BCR’s

The Board notes the following general comments:

1. *The Board has highlighted cells in blue and red bubble on the hard copy which require PCo review*
 2. *The Environmental Matrix should be updated to reflect the Production Group drawings*
 3. *Currently the matrix doesn't reflect the clinical lights schedule submitted through Clinical Lights Specification and Clinical Lights Technical Submittal*
 4. *EM shall be updated to reflect all circulation areas as per SoA*
 5. *Some lux levels don't appear to align with LG2*
 6. *Some ventilation rates don't appear to comply with BCRs. The Board would like to point that is still awaiting response from PCo to the issues raised as per MM-RFI-000172 & MM-GC-002006 relating to ventilation rates"*
29. Point 1 suggests a detailed room by room review has been undertaken by the Board and their advisers. However, the 4 ac/hr for the multi-bed wards and single cubicles in critical care has not been highlighted, nor has the pressure differential in the rooms. The only comment in relation to these rooms is room 1-B1-063, where the ventilation type of "Central Supply Air" and extract of 0.5 have been highlighted.
30. In relation to Point 6 and the reference to communication MM-GG-002006, this relates to the ventilation rates in the single bedrooms and the Board's rejection of the derogations I discuss above (WW014&015) – however no further specific details are provided. MM-RFI-000172 relates to the ventilation system for the CT, MRI, Fluoroscopy & Gamma Camera rooms. This specific query was closed out by Multiplex under communication mail number MPX-RTRFI-001075 **(A46440427 – Appendix 02 – ANX_EDN000208018 – Bundle 13, Volume 1, Page 10)** and **(A46440426 – Appendix 03 – EDN_000301119 – Bundle 13, Volume 1, Page 11)**
31. In terms of the Board's specific comments noted in their email, again these suggest a room-by-room analysis has been carried out and again no comments are raised in relation to the air change rate or pressurisation in the single

cubicles or multibed wards in critical care. The Board's comments were as follows:

"Some specific comments as follows:

- 1. See example G-D1-015 in the table – confirm filtration to physical measurement rooms*
 - 2. Areas off the circulation area/corridor, i.e.. 1-D6-060 Resus Bay indicates transfer air but not known from where. Same principles applies to all Bays and Receptions*
 - 3. See example 1-D7-005 in the table – indicates area of 4m² however General Arrangement drawing shows 4.8m². Please review this and all other similar instances.*
 - 4. See example 3-D9-009 in the table – indicates no cooling and no ventilation but filtration. Please review this and all other similar instances.*
 - 5. See example 3-D9-016 in the table – contradiction, please confirm for this and all other similar instances*
 - 6. See example G-F1-037 in the table – only extract and filtration. Please confirm for this and all other similar instances*
 - 7. See example 1-H2-013 in the table – confirm temperature and cooling requirements for this and all other similar instances*
 - 8. See example 1-L1-015 in the table – "via bedroom and en-suite" confirm extract rates for bedroom and en-suite*
 - 9. All dirty utility rooms – please confirm dirty utility heating type and control*
 - 10. Changing cubicles – will be supplied with 18 deg C fresh air with no option to increase temperature. Please confirm*
 - 11. Dictation rooms – will be supplied with 18 deg C fresh air with no option to increase temperature. Please confirm*
 - 12. 1-P1-067 (see table) – please confirm proposal*
 - 13. 1-P1-090 and 1-P1-005 – should this not be the other way round? Please confirm"*
32. Overall, it appeared to me that the Board had returned Revision 7 as status C because they were frustrated that it was not up to date with certain other documents that had been approved since the previous revision. However, in

my opinion, it is not common practice to do so. An environmental matrix is usually updated every few months, rather than every time there is a change, particularly this late in the Project when it has already been awarded Status B.

33. Giving the document Status C meant that it was not approved. At this stage of the Project that was a major risk.
34. On 7 November 2016, the Environmental Matrix was then upgraded to status B again, but under reservation of the Board's position (**A46440428 – Appendix 04 – ANX_EDN000079746 – Bundle 13, Volume 1, Page 12**). The reason given for the concerns, however, was mail MM-GC-002084 (**A46440429 – Appendix 5 - MM-GC-002084 – Bundle 13, Volume 1, Page 16**) which is the mail reference for the Board's comments dated 17 October 2016 on Rev 7 of the Matrix discussed above. The ventilation comment then being the ongoing contractual disagreement in relation to derogations WW014&015 and the single bedroom ventilation, Multiplex's position being the design was in accordance with what the Board had requested. This then being confirmed in the Settlement Agreement.
35. Nothing materially changes between the Status C and Status B Environmental Matrix.

Multi Bedroom Ventilation

36. On 31 January 2017, Wallace Whittle issued a note entitled "Bedroom Ventilation Key Considerations" (**A46440430 – Appendix 06 – ANX_EDN000208856 – Bundle 13, Volume 1, Page 19**). My understanding is that this was being produced following meetings with the Board/MM to address queries and points they had raised. I did not review it in detail at the time, but I was aware of it.
37. The first paragraph of this document addresses the single bedroom en-suite ventilation. This explained their position in relation to the higher air change rate used in the en-suites.

38. The four-bedroom ventilation is also considered in the report. This is because by this point the Board had now started suggesting that they may want the pressure differential in the multi-bedrooms to be balanced, contrary to their original requirements, which was that they be positive.
39. A review was therefore undertaken by Wallace Whittle to try to get the pressure in the rooms to balance. It stated as follows:

"4 Bed Room Ventilation:

As agreed at the workshop we have undertaken a review of the 4 bed rooms current ventilation design with the view to getting the rooms into a balance. We have looked at a compromise solution by increasing the en-suite and WC ventilation rates from 10ac/hr to 17ac/hr and decreasing the room supply air from 4ac/hr to circa 3ac/hr, which would give a room balance and still maintain supply air to provide the minimum parameters in SHTM 03-01 of 10l/s per person.

In order to achieve this we would need to undertake ductwork alterations which in some instances are quite extensive inclusive of the additional grillage on the dirty extract system as well as increasing the room grille sizes to accommodate the larger air volumes.

There is little opportunity to utilise the general extract system due to ductwork location as it does not tend to run the full length of the systems and main branch sizes, accordingly are relatively small at the duct terminations".

40. Wallace Whittle then issued a further report on 9 February 2017 entitled "Multi Bedroom Ventilation Amendment Proposal" (**A46440433 – Appendix 07 – ANX_EDN000209393 – Bundle 13, Volume 1, Page 21**).
41. This document developed the proposal to achieve the Board's change in relation to the ventilation pressure in the multi-bedrooms. The rooms noted in this document include "B1" coded rooms – in other words, rooms in Critical Care. The drawings attached to this report show exactly where the multi-bed

wards are, including the "B1" multibed rooms in the Critical Care department of the hospital

42. The updated proposed solution was to add an extract to the bedroom, rather than increasing the extract from the en-suites.
43. As noted above, the multi-bed Critical Care rooms were originally detailed as being 4 air changes in the Environmental Matrix, but positive pressure differential. The proposal at this stage was that the air pressure be reduced to 3 air changes in order to achieve the negative/balanced pressure that the Board now wanted.
44. All parties were proceeding on the basis that the start point for all the multibed wards (including those in critical care) was the 4ac/hr rate noted in the Environmental Matrix. This was not questioned by the Board, and at no point was it suggested the Critical Care multi bedrooms were required to have 10 air changes.
45. On 23 February 2017, Wallace Whittle then issued "General Ward – Ventilation Amendment Proposal issue 3", in relation to the changes being request by the Board to the Multi-bed Ward pressurisation **(A46440435 – Appendix 07A – ANX_EDN000199766 – Bundle 13, Volume 1, Page 28)**. Nothing changed in this report in respect of the proposals mentioned above for the multi bedrooms. The report instead talks the Board through exactly what would need to happen in order to implement the proposals and achieve their desired balanced/negative pressure.
46. On 24 February 2017, there was a meeting held with the Board, Multiplex, Wallace Whittle, MM and others to discuss the proposal **(A46440437 – Appendix 08 – ANX_EDN000273257 – Bundle 13, Volume 1, Page 32)**. I did not attend this meeting but was copied into the subsequent emails **(A45500356 – 18 GRC_002_1_00000003-11290 – Bundle 13, Volume 7, Page 431)**.

47. In the record of this meeting, there is a marked-up extract of the Wallace Whittle's "General ward – Ventilation Amendment Proposal to Achieve Room Balance" report produced, with "essential" marked against some of the rooms in red pen **(A46440438 – Appendix 09 – ANX_EDN000273258 – Bundle 13, Volume 1, Page 35)**. My understanding was that this essential/non-essential distinction was being made because of the timing of these alterations and so the Board was specifying what rooms in their opinion it was essential to change, and which were non-essential and therefore did not require to be changed. The multi bedrooms marked as essential in this extract include the Critical Care ones – with the proposal at this stage still being to reduce the air change rate from 4 to 3 ac/hr.
48. On 12 May 2017, I then issued the updated ventilation drawings to IHSL to reflect this proposal **(A46440441 - Appendix 10 - ANX_EDN000177039 - Bundle 13, Volume 1, Page 39)**. These drawings show the changes needed to accommodate the Board's request for negative or balanced pressure in the multibed rooms.
49. We considered this proposal to be an amendment to the original brief for the environmental conditions in the rooms and that it therefore constituted a Board Change. We expressed this to IHSL, and they forwarded the request to the Board **(A46440392 - Appendix 11 - COG_001_1_00000001-25843 - Bundle 13, Volume 1, Page 49)**.
50. The Board, however, rejected the change request **(A46440394 - Appendix 12 - EDI_001_1_00110530 - Bundle 13, Volume 1, Page 51)**. They said that the air change rates in relation to the multi bedrooms did not reflect the relevant SHTMs and were therefore not compliant. They requested a contractor change for this deviation instead.
51. To support their position, the Board made reference to the Activity Data Base (ADB) "Room Environmental Data" sheets, which they said contained the correct ventilation requirements for these multi bedrooms.

52. ADB sheets contain generic guidance and on larger projects they are usually amended to meet the requirements of that particular project – as had happened here.
53. The generic ADB codes referred to by Mott MacDonald for these Multi-bed Areas (including the critical care bedrooms) state the Minimum Air Change as 6, with pressure to be balanced or negative **(A35230437 – 6.10_0070_20111003 ADB_Multi Bed Room_4 Beds – Bundle 13, Volume 7, Page 437)**
54. However, the 01 revision included in the Project Agreement, had been amended to suit the Board's specific requirements and shows 4.0 Air Changes and Positive Pressure **(A46803307 - HLM-SZ-SL-RD-400-001 Room Data Sheets – Bundle 13, Volume 5, Page 1,419)**
55. This is also what was required by the Environmental Matrix incorporated into the Project Agreement and which had been reviewed and approved through the RDD process.
56. In an email of 15 June 2017, Multiplex responded to the Board's rejection **(A46440395 - Appendix 13 - COG_003_1_00000003-04723 - Bundle 13, Volume 1, Page 59)**. Multiplex referred to the correct ADB room data sheets included with the Project Agreement and Building Contract.
57. Given these clearly stated that "positive pressure" was required in the multi bedrooms, our view was that the Board's request for negative/balance pressure was therefore a change from these requirements.
58. These comments were then forwarded to the Board by IHSL on 19 June 2017 **(A46440405 - Appendix 14 - ANX_EDN000110700 - Bundle 13, Volume 1, Page 63)**.
59. Whilst the discussions were ongoing in relation to the Multi-bed Wards, the Environmental Matrix was being reviewed through RDD.

60. Revision 11 of the Environmental Matrix was then returned status B by the Board on 17 November 2017 **(A46440399 – Appendix 15 – ANX_EDN000074985 – Bundle 13, Volume 1, Page 664)**

61. In the body of the email returning the Matrix, the Board stated:

"The design for single and multibedroom ventilation design being progressed by Project Co remains non-compliant and this non-compliance should either be rectified, a PCo change submitted for the Board's consideration or a dispute raised between the parties."

62. No further details or specifics are given; however, my understanding was that this was being added because of the ongoing contractual dispute and discussions in relation to the multi-bed wards. The Minutes of the Project Group Meeting held on 29 November 2017 **(A46440400 - Appendix 16 - ANX_EDN000103645 - Bundle 13, Volume 1, Page 725)** note at item 1.1: "Environmental Matrix: Returned to MPX by Board with minor comments".

Final Position on Multi Bedrooms

63. Following Rev 11 of the Matrix, discussions continued with the Board in relation to the ventilation strategy for the multi bedrooms.

64. In April 2018, Wallace Whittle provided updated ventilation drawings for all areas. The Rev 5 document "General Ward – Ventilation Amendment Proposal to Achieve Room Balance" **(A46440403 – Appendix 17 – ANX_EDN000276472 – Bundle 13, Volume 1, Page 732)**, document still referred to the supply ventilation being reduced to 3AC from 4AC, however by this point the Board had confirmed they wanted 4AC in all multi bedrooms.

65. Updated drawings were then submitted to RDD on 2 May 2018. The relevant drawing for the critical care multi-bedrooms being "WW-Z4-01-PL-524-001". **(A46440409 - Appendix 18 - EDL_003_1_00000004-04681 - Bundle 13, Volume 1, Page 739).**

66. The Board then responded on 4 May 2018 stating they had reviewed the drawings and had no comments on the proposal **(A46440411 - Appendix 19 - ANX_EDN000074983 - Bundle 13, Volume 1, Page 742)**.
67. In an email dated 17 May 2018, Wallace Whittle provided Multiplex with an updated version of the Environmental Matrix showing just the multi ward bedroom which reflected this agreed approach **(A46440412 - Appendix 20 - ANX_EDN000208279 - Bundle 13, Volume 1, Page 745)**. This shows the air changes in the multi bed bedrooms in Critical Care as 4AC/HR, balanced pressure and a mix of Natural and Central Supply & Extract. This was provided to NHSL and MM on 05 July 2018 **(A46440416 – Appendix 21 ANX_EDN000497477 (1) – Bundle 13, Volume 1, Page 750)**.
68. Revision 6 of the "General Ward – Ventilation Amendment Proposal", which detailed this agreed approach, was submitted to RDD and returned Status B by the Board on 31 May 2018 **(A46440414 - Appendix 22 - ANX_EDN000544526 - Bundle 13, Volume 1, Page 754)**. Rev 7 was then returned status A on 27 July 2018 by the Board **(A46440418 - Appendix 23 - ANX_EDN000544528 - Bundle 13, Volume 8, Page 2228)**. The Critical Care Multi Bed Wards are those where the room number includes "B1". The proposed solution for each of these rooms, includes the following:
- "Retain the supply ventilation at 4ac/hr. Introduce new general extract ductwork and grille into the room to provide 4ac/hr overall"*
69. This again records the agreed approach that the multi bedrooms in Critical Care would have 4AC/HR.
70. These works were carried out and the systems commissioned in around October 2018.

IHSL Letter 31 January 2019

71. I have been referred to a letter from IHSL dated 31 January 2019 (**A43103366 – IHS Lothian letter re compliance with SHTM dated 31 January 2019 – Bundle 13, Volume 7, Page 425**) I understand the Inquiry is interested in the statements made in the final paragraphs of the letter in relation to SHTM 03-01.
72. On 28 January 2019, IHSL issued a letter to Multiplex, enclosing a letter from the Director-General Health & Social Care and Chief Executive NHS Scotland. (**A46440417 - Appendix 24 - PID_001_1_00000001-009826 - Bundle 13, Volume 1, Page 760**).
73. The letter is general in nature and appears to have been issued to all Directors of Estates following reviews undertaken at the QEUH hospital and asks for confirmation in relation to four points. The fourth being that: "All critical ventilation systems inspected and maintained in line with "Scottish Health Technical Memorandum 03-01"
74. On 31 January 2019 at 13.03 Multiplex provided a response to IHSL and stated the following in relation to this fourth point: (**A46440420 - Appendix 25 - SIK_001_1_00000002-035641 - Bundle 13, Volume 1, Page 763**).

"All ventilation systems have been designed, installed and commissioned in line with SHTM 03-01 as required"

75. Later the same day at 15.06, an updated version of the letter was then issued, with point 4 having been changed to state (**A46440422 - Appendix 26 - ANX_EDN000214931 - Bundle 13, Volume 1, Page 765**) and (**A46440419 - Appendix 27 ANX_EDN000214932 - Bundle 13, Volume 1, Page 766**)

"All ventilation systems have been designed, installed and commissioned in line with SHTM 03-01 as required systems are maintained in such a

manner which allows handover at actual completion to meet SHTM 03-01 standards”

76. I am the author of these letters. I do not recall why the letter was updated and issued twice. At the time we were in the same office as IHSL, and it may have been that a discussion took place with IHSL, and they asked that the letter be updated, to specify the maintenance aspect which was the predominant point in the letter from the Director-General Health & Social Care and Chief Executive NHS Scotland.
77. In terms of what is stated in the letter - the first part of the fourth bullet confirms the ventilation systems have been designed, installed and commissioned in line with SHTM03-01 as required, i.e., the ventilation systems complied with SHTM 03-01 except to the extent the Board had stated a different requirement. In relation to the second part that was added, this second sentence (there should be a full stop after "as required") relates to the maintenance of the systems. At this point Practical Completion had not yet been granted, so this sentence is confirming the systems are being maintained to allow handover.
78. On 12 February 2019, IHSL then issued a further letter to Multiplex asking for our written assurance in relation to a number of specific matters (**A46440421 - Appendix 28 - PID_001_1_00000001-164402 - Bundle 13, Volume 1, Page 767**).
79. Multiplex responded on 06 March 2019 (**A46440423 - Appendix 29 - ANX_EDN000214968 - Bundle 13, Volume 1, Page 771**), confirming the systems had been designed, installed, commissioned and maintained in accordance with the Construction Contract as varied by the Settlement Agreement. The Multiplex response stated:

“Further to your letter dated the 12th February 2019 requesting our written assurances, we can confirm the following –

1. *The engineering systems are designed and have/are being installed and commissioned to meet the relevant Construction Contract standards, as varied by the Settlement Agreement*
2. *The project has been managed to ensure safety, quality and compliance*
3. *The engineering systems have been commissioned and validated in accordance with the standards within the Construction Contract, as varied by the Settlement Agreement*
4. *Staff and contractors involved in installing, commissioning and operating the systems are suitably trained and qualified*
5. *The systems at Actual Completion were designed and constructed to the specified requirements, including those within the Settlement Agreement*
6. *The engineering systems have been maintained in line with standards and guidance within the Construction Contract as varied by the Settlement Agreement, for the construction phase of the project*
7. *The systems are maintainable and built within the Construction Contract parameters with regard to operating cost, reliability and efficacy*
8. *The records of construction and as fitted documents are complete, save for those varied under the Settlement Agreement. Regarding storage of these records we can only confirm that Multiplex are storing and managing our records in line with the Construction Contract requirements”.*

Settlement Agreement

80. I was part of the Multiplex team involved in the Settlement Agreement between Multiplex, NHSL and IHSL ("SA").
81. NHSL had produced a list of approximately 70 items, which they considered needed to be resolved. My understanding was that this list had been compiled with assistance from NHS Clinicians and MM.
82. Each item was reviewed in detail and discussed.

83. There were some items that were still works in progress, whilst for others the works had been done and the disagreement was in relation to the contractual position.
84. The negotiations were lengthy and detailed and both sides were legally represented throughout the process.
85. The negotiation was recorded in the Project Group Technical Management Meetings. The Minutes from August 2018 to February 2019 show the different SA ventilation items being discussed, culminating in the Minutes on 13 February 2019 (**A46712228 – ANX_EDN000148524 - Bundle 13, Volume 7, Page 1014**), which stated the following action at item 1.21:

1.21

SA – comments on technical items

BC asked if any of the attendees had any queries regarding the outstanding technical items?

The Board don't think they have any, bar the comments issued to MPX regarding the programme which are being incorporated.

WW noted that Rev D of Programme is on Pinsent Masons data site, and will be replaced with Rev E when it is issued. LES noted that Brodies have issued USBs for uploading the latest files to the Pinsents site.

BC noted that the Board will need to review the documents once uploaded. DP noted that MPX will also check these.

GG asked WW if there was any feedback from the Funders? WW noted that this was progressing, they are carrying out due diligence. They are expecting a report by COB on 13/02/19 from the TA.

86. The SA was then executed by all parties on 22 February 2019.

87. Under the final SA, the agreed technical solution for each item, was set out in a Technical Schedule appended to the SA **(A46409292 – Appendix 65 A – Technical Schedule – Bundle 13, Volume 2 – Page 1308)**

The Agreed Technical Position Under the Settlement Agreement in Relation to Ventilation

88. There are 79 items in total detailed in the Technical Schedule, of these 7 relate to Ventilation.

89. Two are particularly relevant to what I have discussed above:

Item 7 – 4 Bed Ventilation

90. Item 7 of the Technical Schedule relates to the Ventilation in the multibed wards **(A46409292 – Appendix 65 A – Technical Schedule – Bundle 13, Volume 2, Page 1308)**
91. The Agreed Resolution was the technical resolution I discussed above - as per Rev 7 of the "General Ward – Ventilation Amendment Proposal", which was returned status A on 27 July 2018 **(A46496633 - Appendix 30 – Extracts from SA – Item 07 – WW-SZ-XX-DC-XXX-010 (1) - Bundle 13, Volume 1, Page 789)**.
92. No further works were required.

Item 13 – Single Bedroom Ventilation Air Changes (A46409292 – Appendix 65 A – Technical Schedule – Bundle 13 Volume 2 – Page 1308)

93. The dispute here related to the single bedroom and ensuite ventilation and derogations WW014 and WW015 I discuss above.
94. The Agreed Resolution notes that this item was closed as the agreed technical solution had already been approved and agreed.

95. No further works were required.
96. My understanding is that this was for all single bedrooms in the hospital with no distinction being made between critical care and non-critical care, as had been the case in the Environmental Matrix.

Practical Completion

97. On 7 February 2019, the Independent Tester issued a letter stating he was ready to certify the works as both practically complete and commissioning complete **(A46457198 – Appendix 31 – 07 Feb 2019 - Bundle 13, Volume 1, Page 827)**.
98. On 22 February 2019, the same day as the Settlement Agreement was executed, the Independent Tester then issued:
- (1) The Commissioning Completion Certificate **(A46457205 - Appendix 32 - Commissioning Completion Certificate - Bundle 13, Volume 1, Page 828)**;
 - and
 - (2) The Certificate of Practical Completion **(A46457203 - Appendix 33 - Certificate of Practical Completion - Bundle 13, Volume 1, Page 829)**
- Confirming the works were complete.
99. Following practical completion, we continued to have a presence on site to support NHSL and Bouygues with the handover.
100. There were also some works to be carried out post Practical Completion, in accordance with the Settlement Agreement. There was an agreed programme for these works, and everyone was working to a July migration.

Involvement of Institute of Occupational Medicine (“IOM”)

101. Multiplex were not involved in the appointment of IOM.

102. On 3 June 2019, we were contacted by the Board and informed by them that they would be carrying out an independent validation of all critical ventilation systems beginning 17th June for approximately 8 to 10 days (**A46457202 – Appendix 34 - WID_002_1_00000007-03830 – Bundle 13, Volume 1, Page 830**). By this point we had already handed the ventilation systems over to NHSL and Bouygues.

103. On 25 June 2019, the Board then forwarded the first "issues log" from IOM (**A46457206 – Appendix 35 - GRC_001_1_00000001-74087 – Bundle 13, Volume 1, Page 832**)

104. One of the items noted states:

“HDU’s – Only achieving 3-4 ach/hr vs required 10 – NHS have apparently agreed this”?

105. Initially the Board did not ask for any input in relation to Critical Care.

106. However, on 2 July 2019 an all-party meeting was held and critical care became the major discussion point. It became apparent that the clinicians and infection control were not in agreement with the Board's project team as the clinicians and infection control wanted 10 air changes per hour in the single bedrooms and multi bedrooms in critical care. However, the design and commissioned systems were 4 ACH.

107. This impacted rooms on the first floor as indicated on the marked-up plan at Appendix 36 - First Floor GA B1 Bedroom Mark Up (**A46457204 - Appendix 36 - First Floor GA B1 Bedroom Mark Up - Bundle 13, Volume 1, Page 835**):

108. As a result, the Board's Project Team asked for IHSL/MPX's assistance in coming up with a change that could be implemented before the migration (i.e., before the opening of the hospital) and then a longer-term modification that could be undertaken post migration.

109. At the meeting on 2 July, various suggestions were made for the interim options and the Board informed MPX they want us to implement an interim option which gave 5 ACH in multibed rooms and 7 ACH in single bedrooms. This being achieved by not using one of the multibed rooms and one single bed, closing off the air supply to these rooms and then diverting that air volume into the remaining rooms.
110. In relation to the longer term change it was discussed that this would likely entail a new AHU and splitting the existing installation roughly in half, using existing plant to serve half and new plant to serve the other half.
111. The Board left the meeting on 2 July and went to their own internal meeting to discuss this subject.
112. On 03 July 2019, the Board then issued an instruction for IHSL/MPX to **(A46457201 - Appendix 37 - BAJ_003_1_00000007-20089-1 - Bundle 13, Volume 1, Page 836):**
- "proceed with adjusting the installed ventilation system in Critical Care to achieve air change rates as per option A on the attached schedule. You are 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)"*
113. The email also noted the programme which had been discussed for these works, namely commencing on Thursday, 4th July and anticipated completion on Saturday, 6th July 2019.
114. At 13.07 on 4 July 2018, the Board then issued a scope and drawings for both the interim and permanent solution which MPX issued to our subcontractor TUV SUD, advising a Change Instruction would follow given this was new additional works **(A46457196 - Appendix 38 - PID_002_1_00000006-37082 (1) - Bundle 13, Volume 1, Page 839)**. The attachments confirm the position I have explained above.

115. At this point, Multiplex's understanding was that the interim solution would be implemented, and the hospital would open as planned.

The Delayed Opening

116. On 4 July 2019, IHSL and MPX were then informed by the Board that the Scottish Government would shortly be releasing a press statement advising that the planned move of patients into the hospital on the 9th July 2019 would not be going ahead on the grounds of safety. As can be seen from my email dated 04 July 2019 at 16.33 (**A46457197 - Appendix 39 - BAJ_003_1_00000007-04340 - Bundle 13, Volume 1, Page 845**), the reason we were given was that it related to the critical care ventilation.

117. This was the first Multiplex were told that the hospital would not be opening, we had no involvement in this decision.

118. That same day the Scottish Health Secretary announced that the opening of the hospital was being postponed due to "final safety checks which revealed that the ventilation system within the critical care department of the new hospital requires further works to meet national standards".

Proposed Post Completion Change

119. Following the delayed opening the Board began discussing the possibility of a post Completion Change for IHSL/MPX to undertake additional works to increase the air change rate in the single and multibed rooms in Critical Care to 10AC.

120. The suggestion being this work would be undertaken as an agreed change to the position required under the Project Agreement, as amended by the SA. Given the significance of the works, we asked the Board to confirm in writing their exact requirements.

121. On 26 July 2019 IHSL forwarded to me the Board's draft High Value Change Notice (**A46457200 - Appendix 40 - PID_001_1_00000001-007859 - Bundle 13, Volume 1, Page 846**).
122. The change asked Project Co to design, supply and install a ventilation system capable of delivering 10 AC per hour and 10 PA of pressure in the critical care areas:
123. On 31 July 2019, IHSL responded (**A46457199 - Appendix 41 - MAJ_001_1_00000001-29141 - Bundle 13, Volume 1, Page 851**) suggesting that contractually the High Value Change process may not be the most appropriate and quickest way of carrying out the change.
124. As the email notes, Multiplex's preference was a separate agreement for the works, as this would allow works to be started as soon as possible and avoid any unnecessary complexity associated with the Change Process under the Project Agreement.
125. This approach was accepted, and the parties then began negotiating an agreement detailing the further ventilation works the Board were now requiring. An agreement could not be reached and so Multiplex did not carry out the additional works.

Declaration

126. I believe that the facts stated in this witness statement are true, that this statement may form part of the evidence before the Inquiry and be published on the Inquiry's website