Scottish Hospitals Inquiry

Witness Statement of

David Wilson

Personal Details and Professional Background

1. Name, qualifications, chronological professional history, specialism etc. – please provide an up-to-date CV to assist with answering this question. Please provide details of your role working for Multiplex Construction Europe Limited previously, Brookfield Construction (UK) Limited until 21 February 2011 and thereafter Brookfield Multiplex Construction Europe Limited until 31 August 2016 (hereinafter referred to as 'Multiplex') during the time Multiplex was appointed as Contractor in respect of QEUH/RHC, providing details of when you started and left this role, your responsibilities.

A David Alexander Wilson
BSc Quality Management & Engineering Technology
Member of the Institute of Engineering and Technology
(MIET) Commissioning Specialist Association Grade 4
1995-1996 – Junior Mechanical Engineer – James Ramsay
Glasgow Ltd
1996-1998 – Commissioning Engineer – Cardiff Commissioning Ltd
1998-1999 – Senior Commissioning Engineer OPM Management Services
Ltd
1999- 2001 – Assistant Commissioning Manager – OPM Management
Services Ltd
2001-2003 – Commissioning Manager / Technical Writer – OPM Management
Services Ltd
2003–2005 - Commissioning Manager / Technical Writer – H&V Commissioning
Services Ltd
2005-2007 – Building Services Manager HBG/.BAM Construction Ltd
2007-2011 – Senior Building Services Manager – HBG/BAM
Construction Ltd
2011-2015 – Commissioning Manager – Brookfield Multiplex Ltd

2015-2017 – National Commissioning Manager – Multiplex Construction Ltd
2017-2018 – Head of Trials & Commissioning – BAE Systems Ltd
2018-now –National Commissioning Manager / Commissioning Lead – Multiplex Construction Ltd
Specialism – Building Services Commissioning
Role at QEUH/ RHSC – Commissioning Manager 2012-2015, Soft landings Manager Feb 2015 – August 2015 (Full time), August 2015 – May 2017 (part Time)

2. What previous experience or training, if any, did you have to work as Director of Construction? How, if at all, did this experience serve you for the role in respect of the QEUH/RHC?

A I was the Commissioning Manager on the project, not the Director of Construction. Before working as Commissioning Manager for Multiplex I had 8 year's experience as a Commissioning Engineer and Commissioning Manager and 6 years as Building Services / Senior Building Services Manager with commissioning as part of my responsibilities. During the years I was trained in BMS and HVAC commissioning as well as electrical training (BS7671C&G 2931) and gained experience through commercial, secondary / tertiary education, life science/ laboratory and healthcare projects

3. Please provide details of any other healthcare projects that you were involved in prior to the QEUH & RHC.

A Llantrisant General Hospital – South Wales – HVAC Commissioning Engineer
Glasgow Royal Infirmary - ICU extension – Snr Building Services Manager
Glasgow Royal Infirmary A&E Extension – Snr Building Services Manager RHSC Edinburgh (Initial Design) – Snr Building Services Manager

4. Please refer to **Bundle 43 Volume 3, Document 12, Page 493 at page 3**
The Inquiry understands that Multiplex refers to itself as having 'Specialist Contractor and Design Team staff'. Please explain what having a 'Specialist Contractor and Design Team' means, what this entails, what necessary qualifications/experience the team holds, the relevance of this specialism relative to

building healthcare premises.

A I was not involved at the pre-contract stage of the project and was not involved in the selection of specialist contractors or design team staff, however my view is that specialist contractors are contractors who have experienced and suitably qualified staff for the products and services they design / supply / install and commission (if relevant) This would be similar for design staff, suitably qualified and experienced for the systems they are designing. As a principal contractors Multiplex outsources (sub-contracts) specialist contractors and design teams

5. On the Multiplex website it states:
'We [Multiplex] have a long track record of delivering world-class hospitals and aged care facilities that enhance wellbeing and safeguard the day-to-day running of existing operations…
Our teams are skilled in the detailed planning and robust scenario-testing required to ensure safety and surety of delivery in highly sensitive environments….
We are experts in delivering state-of-the-art medical facilities in collaboration with our specialist supply chain. Our UK portfolio includes the largest hospital campus in Europe, Scotland's largest children's hospital, and luxury later living accommodation in Chelsea, London.'

a) In delivering world-class hospitals, please explain the level of knowledge and understanding of healthcare regulations and guidance expected of Multiplex staff?

A This question would be better answered by a Multiplex director.

b) Explain your personal knowledge, understanding and any relevant qualifications in healthcare regulations and guidance?

A Before working on the project I had a working understanding of the HTM/SHTM guidance documents relating to design, installation and commissioning.

c) Whilst working on the project what actions did you take, if any, to ensure that your knowledge of the HTM/SHTM guidance documents, in so far as it related to design, installation and commissioning, remained up to date?

A I read the relevant SHTMs outlined in the ERs and if I was made aware of any updates to SHTMs I would review changes.

d) Please explain your understanding of the importance of compliance with healthcare regulations and guidance for infection prevention and control?

A My understanding of the SHTM guidance documents are that they are an important starting point for design of systems and this coupled with user group / Infection control workshops would provide an agreed design (and derogations list) that once installed and commissioned will provide the infection prevention required.

e) Who from the QEUH team provided Infection Control input and at what stage?

A I don't know who was involved during the design stage. The first person I recall was during the domestic water sampling, January 2015, when Ian Powrie was arranging for someone (I can't recall who) from Infection control to witness the sampling. I then recall meeting Dr Christine Peters and Dr Teresa Inkster around June 2015 when reviewing the ventilation design.

Appointment as Contractor

6. The Inquiry understands that Multiplex was appointed as Contractor to undertake the works for the QEUH & RHC. The works under the Building Contract were to be carried out in stages: Stage 1 (Construct Laboratories), Stage 2 (Detailed design of hospital to FBC submission), Stage 3 (Construction), Stage 3A (Demolition surgical block and landscaping) **(Please refer to Bundle 17, Document No. 12, Page 613)**

a) Describe the appointment process leading up to the Multiplex's appointment as Contractor.

A I was not involved in the appointment process as I started with Multiplex in 2011 but worked on the laboratory building until 2012.

b) Describe your role and remit, in particular provide details regarding Multiplex's role, responsibility and authority in respect of the design and build of QEUH/RHC.

A My role was building services Commissioning Manager on the Laboratory building and then the adults and children's hospital. My remit was to manage the building services commissioning process and had the added responsibility of managing the ICT computer and hub room process and liaise with the GGC project team for

commissioning related activities. Multiplex's role and responsibility was the design and build of the laboratory and the adult and children's hospital. I was not part of the pre-appointment team.

c) Who was responsible for ensuring that Multiplex complied with the terms of the contract with NHS GGC in respect of the QEUH/RHC project?

A Ultimately the Project Director, but all staff would have had to play their part in that.

d) What responsibility, if any, did Multiplex have for ensuring that the built hospital complied with relevant guidance such as SHTM and SHFN?

A Various SHTMs / SHFNs were included within the Employers Requirements so Multiplex had a responsibility to design in line with the guidelines.

e) Describe how derogations from the Employers Requirements were signed off by NHS GGC. What role, if any, did you have in respect of this? Who was responsible for ensuring that the Board signed off on derogations?

A I was not involved in the derogation process and don't know who was involved. Darren Smith was the design manager and may have been involved.

f) Describe your working relationship with NHS GGC prior to appointment, had you worked with any members of the NHS GGC Project Team prior to appointment, if so whom and when?

A I worked on two NHS GGC projects prior to this appointment although do not recall working with any of the Project Team. I did know of Iain Powrie before appointment but had not worked directly with him before.

g) Describe your working relationship with NHS GGC during the terms of your appointment, including day-to-day dealings with the NHS GGC Project Team, details of who you worked with and in respect of what matters?

A I did not work with the Multiplex during the appointment

h) Please confirm whether you worked with NHS GGC project Team members during the project. If so, whom? Describe your working relationship with them.

A I worked with Ian Powrie, Alasdair Smith, Karen Connelly, Eleanor McColl, Peter Moir,

Frank Cairnie, David Loudon. I generally had a good working relationship with the NHS GGC Project team and had good lines of communication particularly with Ian Powrie, Karen Connelly, Elenor McCall and Frank Cairnie.

i) Describe your working relationship with Currie & Brown prior to appointment, had you worked with any members of Currie & Brown who worked on QEUH/RHC prior to appointment, if so whom and when?

A I did not work with the Multiplex prior to appointment. I don't recall working with Currie & Brown on any previous projects.

j) Describe your working relationship with Currie & Brown during the terms of your appointment, including day-to-day dealings, and details of whom you worked with?

A I did not work with the Multiplex during the appointment. My first involvement with Currie and Brown would have been during the handover of the Laboratory building and worked with David Hall.

k) Describe Currie and Brown's role and responsibilities in respect of the project. Are you aware of any changes to their role during the project, if so, please explain.

A Currie and Brown were the Clients projects managers. I was not aware of any changes to their role.

l) Describe your working relationship with Capita prior to appointment, had you worked with any members of Capita who worked on QEUH/RHC prior to appointment, if so whom and when?

A I did not work with the Multiplex prior to appointment. I had worked with David Ramsay on a previous project.

m) Describe your working relationship with Capita during the terms of your appointment, including day-to-day dealings, and details of whom you worked with?

A I did not work with the Multiplex during the appointment. My first involvement with Capita would have been during the commissioning of the Laboratory building and had a good working relationship with John Redmond, Allan Follet, Graham Bruce and Douglas Wilson.

n) Describe your understanding of Capita's role and responsibilities in the project.

A Capita were the NEC 3 contract administrators. Their responsibilities included site quality inspections and to witness the testing and commissioning.

o) Who did you report to on a day-to-day basis?

A Darren Pike

p) In respect of other contracts and sub-contractors, explain which contractors and sub-contractors Multiplex had worked with prior to appointment, describe your day-to day working relationship with them, and details of whom you worked with?

A I did not work with the Multiplex prior to appointment; however, I was aware that Multiplex had worked with Mercury Engineering on the Peterborough Hospital project before QEUH. I had not worked with Mercury before although had worked on previous projects with various Mercurys sub-contractors.

q) Describe which contractors you worked with during the projects, their role on the project, your day-to-day working relationship with them and provide details of which individuals you worked with.

A I worked mostly with Mercury Engineering and their subcontractors such as Schneider Engineering (Building Management and Electrical Management Systems), Scotshield (Fire detection and Alarm), Boston Networks (security and ICT infrastructure). I worked with Robbie O'Donovan, Jim Kennedy, Ciaran Kellegher, Sinead Rogan, Declan O Donavan, Ciaran Rogan, Jack Whittam. My relationship was in the most part good although frustrations could set in from time to time if we were not receiving information on time or work was falling behind programme, no different from any sub-contractor.

r) Describe Mercury's role and responsibilities in respect of the project.

A Mercury was the Building Services sub-contractor for the project. They were responsible for the installation and commissioning of the building services installations.

Review of the 'Works Information'

7. What information was provided to Multiplex to assist with the planning and costing of the project to enable Multiplex to prepare the Contractor's Proposals?

A I was not involved in this process as I did not start with Multiplex until 2011 and was working on the Laboratory building on commencement of employment

8. The Inquiry understands that NHS GGC provided a list of guidance documents (e.g. SHTM/SHPN) that the design had to comply with, please confirm what elements of the design contained in the Contractor's Proposals, did not comply with guidance, and why and how any non-compliances were highlighted during the tender process and ITPD process?

A I was not involved in this process

9. What consideration was given to the impact of any non-compliances on patient safety/infection prevention? At what point, if any, was advice sought from Infection Prevention and Control Staff? If advice was sought, from whom was it sought and what was the advice given?

A I was not involved in this process

10. Did Multiplex propose any changes to the exemplar/reference design? If so, please provide details of the changes and why?

A I was not involved in this process

11. The Inquiry is aware of the agreed ventilation derogation recorded in the M&E Clarification Log. **(Please refer to Bundle 16, Document No. 23, Page 1662)**

a) Describe Multiplex's role in respect of the proposals leading to the ventilation derogation.

A Although I was aware of the ventilation derogation during the later stages of the project I was not involved in any discussion at this stage.

b) Question for Witness: When did you become aware of the derogation?

A I don't recall exactly when I was aware of the derogation. I was asked by the board

about air change rates around June 2015 which is when I reviewed the M&E Clarification log.

c) Question for Witness: When you became aware of the derogation, what was your understanding of the derogation?

A I understood that the derogation changed the air change rate from the guidelines set out within SHTM 03-01.

d) Question for Witness: When you became aware of the derogation, what impact, if any, did you understand the derogation to be?

A I understood the derogation changed the ventilation design and the air change rate in bedrooms. This had no impact on construction or commissioning progress as the air change amendment was during the design stage of the project.

e) Question for Witness: When you became aware of the derogation, what was your understanding, if any, of why there was a ventilation derogation?

A I was not involved in the process but understood part of the decision to derogate was to reduce operational energy costs and carbon emissions.

f) What was the reason for the ventilation derogation?

A I was not involved in this process

g) Who drafted the M&E Clarification Log and who was responsible for updating the Log? Following updates to the log, please provide details of who the log would have been distributed to?

A I was not involved in this process and don't know who drafted the log.

h) What was the scope of the agreed ventilation derogation recorded in the M&E Clarification Log? In particular, was it restricted to general wards only? If so, (a) how is this interpretation evidenced within the documentation; and (b) where is the specification located for areas that required specialist ventilation and isolation rooms?

A I was not involved in this process

i) At the time what concerns, if any, did you have regarding the derogation? Did you raise any concerns, if so with whom?

A I was not involved in this process

12. Refer to the ZBP Ventilation Strategy Paper dated on or around 15 December 2009? **(Please refer to Bundle 16, Document No. 21, Page 1657)**

a) What was your/Multiplex's involvement in this document being instructed?

A I was not involved in this process and was not aware of the instruction

b) What was the intended purpose of this document?

A I was not involved in the process but would have thought the purpose of the document was to outline the ventilation design principles to communicate with the project team.

c) When did you first have sight of this document?

A I do not recall seeing the document prior to seeing it in the bundle

d) Who was the document shared with?

A I don't know

e) How was Multiplex satisfied that the proposals set out in the above document were suitable for use in a healthcare setting?

A I want not involved in the process

f) What concerns if any did you have on reading this document? If so, did you escalate these concerns and to whom?

A I do not recall seeing the document prior to seeing it in the bundle

g) What concerns, if any, do you have now on reading the document?

A Given the current debate around the air changes in bedrooms my only comment would be that the document did not refer to infection control in relation to the reduction from 6ach to 2.5ach.

13. Are you aware of any risk assessments, whether in compliance with the standards in HAI Scribe or otherwise, that NHS GGC carried out in respect of the change in the ventilation strategy that appears to follow the ZBP Ventilation Strategy Paper dated 15 December 2009? **(Please refer to Bundle 16, Document No. 21, Page 1657)**

A I was not involved in the process and not aware of any risk assessments

14. Describe the advice sought, if any, or the involvement, if any, of GGC Infection Prevention and Control staff in respect of the change in the ventilation strategy that appears to follow the ZBP Ventilation Strategy Paper dated 15 December 2009?

A I was not involved in the process

15. Who from the GGC Project Team and Board were aware of the ventilation derogation?

A I was not involved in the process

16. How was the ventilation derogation communicated to the wider Project Team?

A I was not involved in the process

17. What impact did the requirement for a BREEAM excellent rating have on Multiplex's proposed design in particular in respect of ventilation?

A I was not involved in the process but not aware of any changes in relation to BREEAM and ventilation.

18. What impact did the energy usage target of no more than 80kg of CO2 per square meter have on Multiplex's proposed design?

A I was not involved in the process

19. The Inquiry is aware that Chilled Beam Units were proposed by Multiplex and accepted for use through the QEUH/RHC. What was the basis for Multiplex proposing to use Chilled Beam Units? Is the use of Chilled Beam Units appropriate throughout hospitals? At the time, what concerns, if any, did you have regarding the use of Chilled Beam Units?

A I was not involved in the process but was not aware of any restriction on using chilled beams in hospitals.

20. Would it have been possible to achieve the sustainability requirements (BREEAM excellent rating and 80kg of CO2 per square meter) if Chilled Beams were not selected for use in the QEUH/RHC?

A I was not involved in the design process so don't know the answer.

Full Business Case

21. Under 'Services Systems' confirmation was required "that the design fully complies with the requirements of the Employers Requirements, M&E appendices 1 to 6, all HTM's, HBN's, SHTM's and current legislation". The Inquiry is aware of several departures from SHTM 03-01 Guidance in relation to air change rates, pressure differentials and filtration requirements. There was also a variation to the primary extract arrangement for PPVL isolation rooms from that set out in SHPN 04 Supplement 01. Was Multiplex aware at the time, of these non-compliances? If so, please confirm how Multiplex communicated these non-compliances to the NHS GGC Project Team. If no action was taken by the NHS GGC Project Team what obligations, if any, did Multiplex have to report matters further and to whom?

A I was not involved in the process

22. Was the ventilation derogation noted in the M&E Clarification Log, recorded in the Full Business Case? Who was responsible for doing this? If you were aware that it had not been recorded in the Full Business Case, please explain what action, if any, you took.

A I was not involved in the process

Design and Construction and Role in the QEUH/RHC Project

23. The Inquiry understands that ward layouts and Room Data Sheets (RDS) were approved through the reviewable Design Data (RDD) process. Describe your role, if any, in the RDD process and the user groups.

A I was not involved in the process

24. How were members selected to be part of a user group?

A I was not involved in the process

25. Confirm who attended the user groups meetings from Multiplex, the NHS GGC Project Team, IPC, Estates and Clinical teams for the following areas: Ward 4B – QEUH; Ward 4C – QEUH; Level 5 – QEUH; Critical Care – QEUH; Ward 2A & 2B – RHC; PICU RHC – RHC; All Isolation rooms.

A I was not involved in the process

26. How often were user group meetings scheduled to review design proposals and agree the design with the user groups?

A I was not involved in the process

27. How were designs and the RDS approved to proceed to construction?

A I was not involved in the process

28. How was the ventilation derogation communicated to users during the RDD process?

A I was not involved in the process

29. Please describe how the technical requirements (air change rates, pressure differentials and filter requirements) for each ward were managed and approved during the user group meetings and the RDD process, including your role and involvement.

A I was not involved in the process

30. Were any requests made by the User Groups during the RDD process that were refused – please provide details.

A I was not involved in the process

31. Please refer to **Bundle 17, Document No.75, Page 2881.** Appendix 3 states: "*Commissioning settings for all elements of the works, including microbiological testing proposals for operating theatres and specialist ventilation… Confirmation that the design team fully complies with the requirements of the Employers Requirements, M&E appendices 1 to 6, all HTM's, HBN's, SHTM's and current*

legislation".

a) Describe the intended use and purpose of the following wards in QEUH/RHC: Ward 4B – QEUH; Ward 4C – QEUH; Level 5 – QEUH; Critical Care – QEUH; Ward 2A & 2B – RHC; PICU RHC – RHC; all Isolation rooms.

A Ward 4 b was the Haemato Oncology ward but changed to Bone Marrow Transplant ward. QEUH/RHC Critical card wards were multi bed wards for critically ill patients. Ward 2A and Ward 2b were for children with / recovering from cancer., PICU RHC, was the Pediatric Intensive Care Unit which was a multi bed ward for critically ill young children. The RHC isolation rooms were single bed rooms with ensuite toilets (in some of the rooms) and pressurised lobby's and increased air change rates. I'm unable to recall the purpose of Ward 4C or Level 5 QEUH.

b) What were the specifications of these wards?

A I don't recall the specifications of the wards with the exception of Ward 4b as the specification changed post-handover and I was directly involved with the change. The specification for the ward was discussed with NHS GGC in July 2015 and the upgrade involved upgrading the existing AHU to achieve a higher volume flow rate and a differential pressure (rooms to the corridor) of between 6 and 8Pa, the ceilings were changed from lay in grid type to plasterboard ceilings with sealed joints (room pressure testing was carried out) and a room differential pressure indication and alarm system installed.

c) You say the specification changed? From what? Where did you find the pre-existing specification for that ward?

A The pre-handover requirements / specification for Ward 4b was the basis of ZBPs ventilation design and what the ward was commissioned to.

d) Question for Witness: Were you in charge of the commissioning of that ward prior to July 2015?

A I managed the commissioning process for Multiplex which included Ward 4b.

e) Question for Witness: Most of the changes you list appear as if they should have been in place previously, can you help the Inquiry as to why they were not.

A I was not involved in the design process so don't know why they were not part of the

original design.

f) Who were Wallace Whittle working for at this stage?

A Wallace Whittle took over ZBP so were working for Multiplex in 2015.

g) What guidance was considered in the design of these wards, what processes were in place to ensure guidance compliance?

A I was not involved in the design process with the exception of the post-handover upgrade to Ward 4b. In this case NHS GGC provided guidance on their requirements and Wallace Whittle would have carried out the design.

h) Were there any changes to the design during the design and build, if so, please describe any such changes, describe the impact, if any, on guidance compliance as set out in Appendix 3, and describe the sign off process for any such changes, your involvement and how any changes were communicated to the Board. Was external advice ever sought in respect of design changes?

A I was aware of changes to Ward 4b during the build stage of the project but was not involved in the change process. I was involved in the post-handover design changes and NHS GGC were fully involved in the process.

32. Describe your involvement and understanding, if any, of the decision to remove carbon filters? What was the rationale behind this decision, who was involved and what advice, if any, was sought in reaching this decision?

A I was not involved in the process but aware that there had been agreement not to include them in the design

33. Were any specialist design workshops required? If so, please provide details.

A I was not involved in the process

34. Were Value Engineering meetings/workshops held during the design phase? Please provide details of any agreed value engineering elements.

A I was not involved in the process

Ward 4B and 4C

35. The Inquiry understands that Ward 4B in the QEUH was originally intended to provide accommodation for Renal and Haemato-oncology patients. The 2009 NHS Clinical Output Specification for the Haemato-oncology ward stated, “Please note the haemato-oncology ward area has a very specific function and a considerably higher than average requirement for additional engineering support/infrastructure. There should be no opening windows, no chilled beams. Space sealed and ventilated. Positive pressure to rest of the hospital and all highly filtered air >90%, probably best HEPA with adequate number of positive pressure sealed HEPA filtered side rooms for neutropenic patients as in the Beatson West of Scotland Cancer Centre.” **(Please refer to Bundle 16, Document No.15, Page 1595)**. However, following a Change Order Request in July 2013 by Jonathan Best **(Please refer to Bundle 16, Document No.29, Page 1699)** it was confirmed that the Bone Marrow Transplant (BMT) service would transfer to Ward 4B in the QEUH and the hematology patients that were originally planned to accommodate Ward 4B would move to Ward 4C.

a) Please confirm how this change was communicated to Multiplex and how this change was captured in the revised design and specification documentation, following the Change Order Request.

A I was aware of the change but not involved in the process

b) Please confirm if Multiplex highlighted any risks with the proposal to move the adult BMT Unit to the QEUH.

A I was not involved in the process

c) Did Multiplex advise the GGC Project Team that the requirements set out in SHTM 03-01 relating to air change rates, pressure differentials and filtration requirements would not be achievable in Ward 4B at the QEUH?

A I was not involved in the 2013 change but was involved in the post completion change in 2015, where we advised the project team that the plant and rooms were not designed to achieve the air change rate and positive pressure they now required.

d) What ACH did Ward 4B achieve prior to the works in 2015?

A I believe the air change rate was 6ac/h based on the supply ventilation being 80l/s.

e) Following the Ward Change Order in 2013, are you aware of any changes being made to the specification of the requirements if Ward 4B prior to the works in 2015?

A No

f) How were these works categorised, as additional works or defects?

A Additional works, Multiplex were instructed to carry out the works.

g) Question for Witness: You use the phrase ‘now required’. Were these ACH and pressures not always required once the BMT Unit was to be in QEUH? Would you be aware of that as in charge of commissioning?

A The air change rate and pressures the board now required were different to the ZBP design. I was aware of the design requirements and the ventilation was commissioned in accordance with that.

h) Who approved the lower specification from the GGC Project Team and the Board for the adult BMT service?

A I was not involved in the 2013 changes but the changes made in 2015 were instructed by the GGC team, David Loudon/Peter Moir.

i) Why were suspended ceilings installed in Ward 4B given that the original Clinical Output Specification (COS) referred to ‘space sealed’ – did Multiplex raise this as a non-compliance with the ‘Works Information’?

A I was not involved in the process

j) Please confirm who approved the reflected ceiling plans for this area.

A I was not involved in the process

k) As construction progressed on site, please confirm if suspended ceilings were highlighted as non- compliant with the COS (works information).

A I was not involved in the process

l) Why was no back up Air Handling Unit (AHU) provided for Ward 4B? Who approved this decision? And what strategy was agreed for PPM or equipment failure?

A I was not involved in the process

m) Describe in detail the works carried out to Ward 4B, including but not limited to any changes in specification, works to ceilings, changes to venting and ductwork. Please explain why these works were carried out, what impact these works had on the specifications for Ward 4B.

A The works for ward 4B included removal of the lay in grid ceiling and changing to a solid plasterboard ceiling and sealing up of all joints in preparation for a room air permeability test to each room. The building services work carried out included upgrading the AHU serving the ward to provide more air to assist in achieving the positive pressure required, re-clean the ductwork, re-balance the supply and extract ventilation, install and commission a room differential pressure display and monitoring system and replace all HEPA filters and retest.

The works were carried out as the ward was now deemed as not suitable by the clinical staff/ Infection control.

The works carried out met the specification agreed with the board.

n) Question for Witness: What was your understanding, if any, at the time of the impact the necessary works had on patients.

A I recall patients were moved out in July 2015.

o) Question for Witness: Describe the involvement and role of infection control staff in the works to Ward 4B in 2015.

A Dr Christine Peters was involved in June 2015. She was reviewing the ventilation design. Dr Terisa Inkster was involved as she (or her team) were carrying out microbiological platelet testing within some clinical rooms in the building including Ward 4b. I can't recall exactly but I think that Dr Inkster was involved in the review of upgrade works to Ward 4b.

p) Question for Witness: At any time do you recall anyone raising questions or issues, as to why the works in 2015 were not incorporated into the design and building at the time of the Ward Change Order in 2013?

A I don't recall exactly but Dr Peters may have queried it.

q) Question for Witness: At any time do you recall the ventilation derogation being discussed relative to Ward 4B?

A I don't recall it being mentioned

r) Question for Witness: What requirement in 2015 was there to replicate the standards offered at the Beatson in Ward 4B?

A I recall that there was the desire from the clinical team from the Beatson wanted to Ward 4B to replicate the facilities at the Beatson although the 10ach could not be replicated with the existing AHU and ductwork.

s) In respect of Ward 4C, what was the specification of this ward at the point of the Change Order? Did you understand that Ward 4C was to be used to house immunocompromised patients? If so, what was the justification from departing from SHTM guidance in respect of ventilation, pressure and filtration requirements and who signed this off?

A I was not involved in the process

t) Although you state you were not involved, what was your understanding, if any, at the time of the ventilation specification of the Ward at the time, and what was the justification for departing from SHTM guidance?

A I don't recall Ward 4C being an issue it was Ward 4B conditions that were problematic to the clinical team and infection control.

u) What was your understanding of the requisite air change rate required in accordance with SHTM guidance in respect of Ward 4B and 4C, and was this the air change rate achieved? If not, why not and who signed this off? What risk assessments were considered in respect of this decision?

A I was aware of the design air flow rate required for each room (as per the ZBP/Wallace Whittle design schedules and drawings and Mercurys commissioning documentation) which was achieved during the commissioning of the ventilation system. This equated to 6ac/h for Ward 4b. I don't recall Ward 4c

v) Question for Witness: Did the ACH for Ward 4B equate to 6ACH pre or post the 2015 you refer to above?

A The Ward 4B air change rate was 6ach before the remedial works in 2015

w) Question for Witness: Describe the working relationship with Mercury during the works to Ward 4B in 2015? Please refer to **Bundle 43 Volume 1, Document 63, Page 324**. This document appears to show a strained relationship with Mercury during this process please discuss.

A I don't recall a strain, but we were under pressure to get the ward completed and commissioned which brought in frustrations.

Ward 2A/ 2B RHC

36. The Inquiry understands that Ward 2A/2B is the paediatric-oncology Unit and includes the Teenage Cancer Trust and the paediatric Bone Marrow Transplant (BMT) Unit - the department is known as the Schiehallion Unit.

a) Confirm your understanding regarding the intended use and purpose of the Ward 2A/2B, what guidance was considered in the design of these wards, what processes Multiplex put in place to ensure guidance compliance?

A I was not involved in the design process but my understanding was that the wards would hold child cancer patients.

b) Although you were not involved in the design process, what processes, if any, did Multiplex put in place to ensure guidance compliance? If so, please provide details.

A The design would have been reviewed by Multiplex design managers, to check for compliance and if the design was in line with client's requirements.

c) What changes, if any, were made to the design during construction? Please describe any such changes, describe the impact, if any, on guidance compliance, and describe the sign off process for any such changes and your involvement. Was external advance ever sought in respect of design changes?

A I was not aware of any changes during construction although I was not directly involved in design changes.

d) Describe the IPC involvement in the design of Wards 2A and 2B, who was involved and who signed off the final design and when?

A I was not involved in the design process

e) What concerns, if any, did you have regarding the final design specification of Wards 2A and 2B, and what action, if any, did you take in respect of these concerns?

A I was not involved in the design process and accepted that the systems that were designed, installed and commissioned were in accordance with the design agreed with NHS GGC.

f) The inquiry has heard evidence indicating that problems were identified in Ward 2A almost immediately on occupation. Can you assist the Inquiry as to how that is consistent with what you say?

A My recollection is that the issues identified were around design / specification of the ward rather than the commissioning which was completed in accordance with the design.

g) The Inquiry has also heard evidence that full examination of Ward 2A revealed a range of issues. Please refer to **Bundle 6, Documents 33 and 34** to assist**.** Can you assist the Inquiry as to how that relates to your evidence suggesting everything was done correctly?

A The issues identified within the reports by Innovated Design are design and specification issues. The ventilation systems within Ward 2A were commissioned in line with the approved design at the time.

37. What was your understanding of the requisite air change rate required in accordance with SHTM guidance in respect of Ward 2A and 2B, and was this the air change rate achieved? If not, why not and who signed this off? What risk assessments were considered in respect of this decision?

A I would have been aware of the design air flow rate required for each room (as per the output ZBP/ Wallace Whittle design schedules and drawings) which was achieved during the commissioning of the ventilation system. The wards had several Isolation rooms which would have had greater design flow rates (therefore air changes) and a pressure regime. I was aware of the recommended air change rates

detailed in SHTM 03-01 but considered the design air flow rates detailed within the ZBP design schedules were agreed with NHS GGC. I was not involved in the design process or approval of the design.

Isolation Rooms

38. Describe how the number and location of the isolation rooms was agreed? Who approved the final number and locations in the QEUH and RHC?

A I was not involved in the design process

39. Who was responsible for producing the drawings and the specification for isolation rooms; who approved these from the NHS GGC Project Team?

A I was not involved in the process but drawings and specifications were generally produced by ZBP/Wallace Whittle for the building services.

40. What concerns, if any, did you have regarding isolation rooms and compliance with SHTM/HTM? What action, if any, did you take in respect of any such concerns?

A I did not have any concerns with the Isolation Rooms at the time of commissioning as the installation was as per the design drawings and my understanding was that the design of the isolation rooms was based on the NHS GGC requirements.

a) What was your understanding based on?

A That the drawings had been reviewed by both Multiplex design managers and the NHS GGC project team and its advisors.

41. The Inquiry has reviewed the RDS in excel format and notes that there is an entry under 'Design Notes' relating to Ward 2A isolation rooms, the entry states: *"WARNING NOTICE: This room is based on a theoretical design model; which has not been validated (see paragraph 1.8 of HBN 4 Supplement 1). Specialist advice should be sought on its design. The lamp repeat call from the bedroom is situated over the door outside the room."*

a) Was this note entered on the RDS? If so, why and by whom?

A I was not involved in the process

b) What specialist advice was sought relating to the design of these rooms

A I was not involved in the process

c) What was the final agreed design for isolation rooms and who approved this?

A To my knowledge the final agreed design for the isolation rooms was positive pressure lobby (10pa) with main extract from the bedroom and 10ac/h as per the ZBP/Wallace Whittle drawings and schedules. I am not aware who approved the design as I was not involved in the process.

42. Why was the main extract placed in the patient's bedroom and not the ensuite as outlined in SHPN 04 Supplement 01? Why was this change requested, who requested this change and who approved this from the NHS GGC Project Team?

A I was not involved during the design process

a) Please refer to **Bundle 12, page 781**. Please explain what the issues were being discussed. Why you wanted to keep matters 'high level' what concerns did you have at this time?

A There were a lot of parties some of whom were not building services engineers and I wanted to keep the response to the issue around the compliance with SHPN-04 supplement 1 which was the important question.

<u>Water and Taps</u>

43. Describe your involvement, if any, in respect of the decision to use Horne taps.

A I was not involved in the process but aware that there was discussions and workshops with Multiplex and NHS GGC

a) What concerns, if any, did you have regarding the use of Horne taps?

A I did not have any concerns as my understanding was that the use of the Horne taps was agreed with the Multiplex, design team and NHS GGC.

b) What risk assessments were carried out in respect of the use of Horne taps?

A I was not involved in the process and not aware of Risk Assessments

c) Who was involved in, and who signed off the use of Horne taps?

A I don't recall who signed it off but aware that Multiplex was involved in the process.

d) Did you attend the meeting regarding the use of Horne taps in 2014**?** If so, why was the decision made to proceed with Horne taps?

A I don't recall attending any meetings.

e) Did the use of Horne taps depend on thermal disinfection? If so why, if not, why not? What action, if any, was taken regarding this, and your involvement, if any?

A I was not aware of the requirement for thermal disinfection although understand that the taps were designed to be (relatively) easily removed and replaced to allow NHS GGC estates team to remove and replace the taps and carry out thermal disinfection to the removed taps. At one point there was a plan to install a thermal disinfection station in plantroom 31to allow thermal disinfection of multiple taps at the same time.

f) Question for Witness: You were aware of the planned process for disinfection of Horne taps. Can you assist the Inquiry as to why they were installed and used without that process being operational?

A The thermal disinfection station was to be instructed by NHC GGC as it was not part of the original design. It was to assist the Estates Engineers in thermally disinfecting multiple taps at a time. The taps could still be removed and thermally disinfected by the FM team by autoclave or by immersion in hot water.

44. Are you aware of the water system having been filled prior to handover on 26 January 2015? If so, who filled the system, why was it filled and what concerns, if any, did you have. If you had concerns to whom did you escalate these concerns?

A I was aware that the systems were filled before January 2015. The systems were filled by Mercury Engineering (mechanical and electrical installation, testing & commissioning contractor). The systems had to be filled prior to January 2015 as if not we would not have been able to complete the testing, commissioning, disinfection and sampling of the water systems before handover. Although I can't remember exactly when the systems were filled (they were filled in phases) the process would have been ongoing through 2014. Mercurys process was that the system was initially tested with air (to ensure there were no open ends) prior to being filled with water for

a hydraulic pressure test to ensure the pipes were sound with no leaks before ceilings and finishes were installed. I had no concerns when the systems were filled as my understanding was that Mercury and H&V Commissioning (Mercurys water specialist) would manage the water in the systems between after the filling and testing before flushing, commissioning, disinfection, sampling and post disinfection draw off. It is usual practice to fill water system to hydraulically test before finishes are installed. After the system were filled with water they were to be handed to H&V Commissioning.

b) What, if any, precautions were taken in respect of filling the water system?

A Mercury took samples of the Scottish Water incoming water and had it microbiologically tested before using it to fill the systems.

c) Are you aware of whether the water system was flushed following testing? Is this something that you would have expected to have happened? Please explain your answer.

A Yes I expected this to have happened as it was part of the process and part of the HSE guidelines. I was aware of draw offs and flushing taking place by Mercury.

Commissioning and Validation

45. In respect of commissioning and validation please confirm the following:

a) Describe your role in the lead up to commissioning. What action, if any, did you take to ensure that the wards within RHC and the QEUH met the guidance requirements of SHTM?

A My main role in the lead up to commissioning was to plan the commissioning activities and produce a commissioning programme in collaboration with Mercury Engineering. My role was to check systems were programmed to be commissioned (in the correct sequence) and that RAMS were produced and agreed (I reviewed the majority of the commissioning RAMS)

b) What do you mean by “commissioning RAMS”? Please provide details.

A Commissioning RAMS are commissioning Risk Assessments and Method

Statements. The RAMS would include the method and process for the relevant commissioning activity as well as the health and safety process to be followed by the engineer carrying out the commissioning activity.

c) Describe what commissioning of the water and ventilation system took place prior to handover, and your involvement, if any.

A I was involved in the planning and progress monitoring of the commissioning of both the water and ventilation system. I also organised the demonstration/witnessing of the systems by the Multiplex team (on some occasions I witnessed system testing/commissioning) and invites were sent to Capita (Allan Follet and Graham Bruce early in the contract then Douglas Wilson) and members of the GGC Project Team (generally Ian Powrie and Alastair Smith) I liaised and worked with Mercury (and their specialists) to ensure that (to the best of my ability) that the systems were tested and commissioned in accordance with the design drawings / specifications / schedules and RAMS.

The water system testing /commissioning (by Mercury Engineering and H&V Commissioning Services) commenced with pressure testing - compressed air then hydraulic pressure test thereafter the system was managed by Mercury / H&V commissioning until system commissioning. The commissioning process was leachate flushing, then hot water system thermal balancing, TMV (Thermostatic Mixing Valves) setting / testing then tap/outlet temperature check. The final commissioning activity was disinfection followed by bacteriological sampling and water management/ bi weekly draw offs. Various items of plant were tested / commissioned at stages, including Storage Tanks, Filtration Unit, Booster Sets.

The ventilation system testing / commissioning commenced with a pressure / integrity test (a percentage of each system was tested), Fire damper / smoke damper testing, ductwork cleaning (where specified), system commissioning and proportional balancing, pressure regime checks / adjustments (on certain systems such as theatres and Isolation rooms) and HEPA filter testing (where specified).

d) How did you decide which tests to invite Capita and the GGC Project Team to? Was a representative from Capita and the GGC Project Team invited to witness every test? If not, why not?

A The process was to invite the agreed people from Capita (Allan Follet, Graham Bruce, Douglas Wilson) and the NHS project team (Ian Powrie, Alistair Smith) to all commissioning activities. Invites were generally issued via Aconex but on some occasions, there may have been a phone call or a face to face invite.

e) Did you have any difficulty ensuring that the systems were tested and commissioned in accordance with the design drawings / specifications / schedules and RAMS? If so, please describe those difficulties and any action you took to overcome them.

A I don't recall all the issues or any specifics, but problems and issues are often uncovered during testing and commissioning. Mercury would have dealt directly with most of the issues when they arose but there would have been occasions where we would have workshops with Mercury and their specialists to review issues and plans to resolve.

f) Why did Capita not countersign commissioning statements?

A I don't think it was in Capitas remit to review and comment on Commissioning RAMS.

g) Who was responsible for ensuring that commissioning of the water and ventilation system was carried out, and who signed off that it had been carried out?

A Mercury Engineering were responsible for ensuring systems were commissioned correctly in line with the design criteria, manufacturers guidelines and RAMS and I was responsible for monitoring this on behalf of Multiplex. The systems were signed off by the relevant Commissioning Engineer and signed as witnessed (most systems were sample witnessed as opposed to witnessing all commissionable parameters) by Multiplex. Capita and representatives of the GGC Project team were invited to witness commissioned systems and in most cases a representative attended (Capita – Allan Follet, Graham Bruce, Douglas Wilson. NHS GGC – Ian Powrie, Alastair Smith) but generally did not sign the commissioning certificates.

h) Please explain the process involved in "sample witnessing" and why this witness testing protocol was followed in relation to testing the QEUH/RHC building systems as opposed to "witnessing all commissioning parameters."

A Sample witnessing is common in the construction industry and refers to picking a random selection of parameters to check that they are as detailed within the

commissioning engineers report. For example, on a ventilation system with 50 grilles, 10% or 5 grilles would be checked. If any grilles were not as per the engineers report, the engineer would be asked to investigate and rectify before the system would be re-witnessed. All systems would be witnessed.

46. Clause 6.8.2 of the Employer's Requirements requires the Contractor to provide a Final Commissioning Programme setting out details of all commissioning tasks, including the timing and sequence of events. This was also to include the relevant testing and commissioning elements of other parties, such as the Control of Infection Officer, the Supervisor and the Independent Commissioning Engineer. **(Please refer to Bundle 16, Document No. 13, Page 1357)**

a) Was the Final Commissioning Programme prepared? If so, by whom and who was it shared with? If not, why not?

A I produced the building services commissioning programme with Mercury which included system testing and commissioning activities. A programme was produced for each build / commissioning stage of the works starting with Plantroom 21 then Plantroom 31 and 22, Plantroom 32,33 and Towers and plantroom 41 and associated areas with a final Global commissioning programme for system serving the entire building such as water, medical gas, Fire alarm etc. The programmes were issued to NHS GGC and Capita. All system testing and commissioning witnessing activities were communicated to Capita and NHS GGC via Aconex invites. We expected the GGC project team to invite any other people that they thought would be relevant to witnessing such as the Infection Control Officer. I recall that the board also produced a what they termed a commissioning programme for their commissioning and migration post-handover.

a) What reference, if any, was made to the requirements of SHTM 03 01 during commissioning?

A The commissioning elements noted with SHTM 03-01 were reviewed and in many cases outlined in the normal building services commissioning processes which were also outlined within the Commissioning RAMS. For example, SHTM03-01 outlines specific commissioning process for UCV theatre canopies which would have been replicated within the Commissioning RAMs and carried out by the UCV canopy commissioning engineer.

b) SHTM 03 01 provides for validation as a step to be taken before handover is accepted. Were you aware of this? What provision in the programme was made for it to be carried out successfully?

A Yes I was aware of validation within SHTM 03-01. It was not included within the Multiplex programme as this was a board activity

47. Clause 6.8.4.2 of Employer's Requirements, states that the Contractor was required to arrange, "all factory testing and shall furnish the Board, its Project Manager and its Supervisor with the opportunity to witness all factory testing and sign off marked items of Plants and Materials. The Board, its Technical Advisors and the Supervisor shall be given fourteen days notices of such testing." **(Please refer to Bundle 16, Document No.13, Page 1357)**

a) Was Capita given the opportunity to witness all factory testing and sign off on marked items of Plants and Materials?

A My involvement in the Factory testing was limited as I was working on the Laboratory at the time. I recall that only a selection of the main plant was required to be Factory tested which is not unusual.

b) If Capita was given the opportunity to witness all factory testing, please describe the process.

A I was not directly involved in the process this was managed by the relevant system M&E Manager and Mercury so I don't know if Capita were invited.

c) If Capita was not given the opportunity to witness all factory testing, why not? How did this impact, if at all, Capita's role as NEC3 Supervisor?

A I was not involved in the process

48. The Inquiry understands that NHS GGC decided to forgo the requirement to have an independent commissioning engineer. Who made this decision? What was the rationale was behind this decision? What was the impact, if any, of this decision? In hindsight, do you think that it was the correct decision?

A I was not involved in the process, but my understanding was the GGC project team accepted that Multiplex were to manage the commissioning process therefore the Commissioning Manager was to be employed by them. Any independent engineer

would have had less impact in managing the process if they were not part of the Multiplex team.

a) Please explain your reference to ‘less impact’.

A Normally independent commissioning engineers or a client commissioning engineer has an observation and witnessing role and not a close managerial role.

b) Do you accept that an Independent Commissioning Engineer would have meant commissioning could not have been concluded without an independent view on compliance? Please refer to your answer at Q53a when considering your answer.

A. That would have depended on the remit of the independent commissioning engineers. If their role was to witness the commissioning based on the design there would have there been little benefit as the commissioning was carried out in accordance with the design. There were already members of Capita and the NHS GG&C project team witnessing commissioning to ensure they were happy that it was in line with the design.

49. Please **refer to Bundle 15, Document 7, Page 606. SHTM 04-01, part E** states that, “any pipes delivered unprotected or with open ends should be rejected”. The Inquiry understands that Capita highlighted on a number of occasions that pipework was being left open during the construction work making them vulnerable to contamination. What was done to rectify this issue? Was such pipework subsequently rejected?

A Although I was not directly involved in the delivery process, my understanding was that the pipework was delivered protected. The issues highlighted by Capita were that in some instances pipes were installed and had been left without the ends being capped / covered. As far as I was aware this was dealt with by the Multiplex Site Managers and Mercury Supervisors and signed off by capita when the issue was resolved.

50. Was the energy centre commissioned prior to NHS GGC taking occupation of QEUH? If so, describe what you know about the commissioning of the energy centre. Provide details of the intricacies in relation to its completion.

A The systems within the energy centre (MTHW, CHW, HV supply, generators,

switchboards etc.) were commissioned prior to handover to NHS GGC. The CHPs, although commissioned had not been fully integrated into the MTHW system controls at the time of handover.

51. Describe your involvement, if any, in the decision for the energy centre to be retained by Multiplex following handover. What as the rationale/when was the energy centre handed over to NHS GGC, and what was your involvement, if any? Describe your knowledge and understanding, if any, of a payment being made by NHS GGC to Multiplex in respect of the energy centre following the same being handed over.

A To my knowledge the energy centre was handed over for NHS GGC to operate at handover and was not retained by Multiplex.

52. Please describe what role Multiplex had, if any, in ensuring that validation was carried out? Was this required to be carried out prior to handover? If so, by whom? The Inquiry understands that validation was intended to be carried out by an independent party. Did this happen? If not, why not?

A Multiplex (sub-contractors) role was to commission the systems and did not have any role in validation which was the responsibility of NHS GGC

Handover

53. Describe your role in the lead up to NHS GGC accepting handover.

A My role as Commissioning Manager was managing the final commissioning process, monitoring progress, chasing final certification and organising the system witnessing. I was also reviewing O&M information produced by Mercury and organising Mercurys system training to NHS GGC (Client training)

a) At the point of handover, how satisfied were you that all areas of QEUH/RHC accepted by NHS GGC, were designed to the intended specification and suitable for the intended patient cohort, meeting all the relevant guidance requirements?

A At the point of handover I was satisfied that the life safety systems had been commissioned to achieve a building control temporary habitation certificate and that the majority of systems were complete and commissioned in accordance with the ZBP/ Wallace Whittle design. However, there were systems that were still being

worked on and instructed works being completed post-handover. patients were not moving into the building at building handover, there was a period for NHS commissioning before the first patient cohort moved in.

b) How were you assured that the wards met the requirements of the specific patient cohorts?

A My job did not involve making sure wards met the requirements of patient cohorts which was a job of NHS GGC.

c) Were any wards not handed over, or only partially handed over, please confirm. If so, why they were they held back? Was there any financial consequence to both Multiplex and NHS GGC of the ward(s) being held back? What works were carried out in order to allow this ward(s) to be handed over to the NHS GGC?

A I don't recall if any wards were not handed over, however there were fit out works by NHS GGC and some works instructed to Multiplex post-handover. I was not involved in any financial negotiations

d) Describe the process for approving the defects listed on the Stage 3 Sectional Completion Certificate **(Please refer to Bundle 12, Document No. 3, Page 23)** Who saw the Stage 3 Section Completion Certificate before it was signed? Why was the Stage 3 Sectional Completion Certificate signed when there were a number of outstanding defects listed?

A The process was that Multiplex and sub-contractors would address the defects and Capita would then inspect / review and sign off. Regular meetings were held with Capita to review progress.

e) Do you think that the Stage 3 Sectional Completion Certificate accurately listed all of the defects with the QEUH/RHC? If not, please describe the inaccuracies.

A I don't recall being involved in that part of the process although would have seen the document at some stage. My recollection was that NHS GGC were keen to take control of the building and accepted that Multiplex would address the defects during the defect liability period

f) On what do you base your understanding of NHS GGC wanting to take control of the building notwithstanding defects? The inquiry has heard extensive evidence about apparently significant issues with Wards 2A and 4B. Can you assist the inquiry to understand why none of these issues were apparently identified at the time of the Completion Certificate?

A Ward 4b and 2A had been completed and commissioned in accordance with the design. I don't recall anyone querying the design at project handover.

g) Do you think that the Stage 3 Sectional Completion Certificate accurately listed all of the defects with the QEUH/RHC? If not, please describe the inaccuracies.

A I don't recall the contents of the completion certificate at the time of handover but on viewing now, it looks accurate

54. Who oversaw contractual compliance? Who was responsible for ensuring that the paperwork was produced to confirm contractual compliance? What action, if any, did you take to ensure that paperwork was in place to ensure contractual compliance? Was validation of the ventilation system a contractual requirement? If so, who signed off on contractual compliance given the lack of validation?

A Capita oversaw contractual compliance. Mercury were responsible for producing the building services test and commissioning certification for contractual compliance. I chased Mercury to issue certification and tracked the certification and met with Capita to review (test and commissioning certification was uploaded to Zutec – digital online data storage platform). As far as I was aware our contract was to commission system, validation was by others.

a) **Please refer to Bundle 16, Document No. 13, Page 1357**. As per clause 8.2.28.4. of the Employer Requirements it was Multiplex's ultimate responsibility to, "to demonstrate and certify to the Board the successful completion of all commissioning, testing and compliance with all relevant standards." How satisfied were you that all testing and commissioning certification for contractual compliance had been uploaded to Zutec prior to handover?

A Not all commissioning certificates had been uploaded to Zutec at the date of handover. We were still chasing Mercury for any remaining certificates.

55. Explain what the Building Contract says about a retention period in which some money would be held back pending completion of the QEUH/RHC. In doing so, please explain if the retention period was enforced?

A I did not deal with retention

56. Who was responsible for providing asset tagging. Why was there no asset tagging? Who decided to proceed without it?

A Multiplex / Mercury were responsible for asset tagging of the building services which involved fixing a QR code to the relevant assets. The physical asset tagging was completed post-handover. NHS GGC had not agreed the CAFM system they were going to use. My understanding was that there was an agreement to transfer the asset list and PPM (planned Preventative Maintenance) from Zutec to the chosen system (by NHS GGC) post-handover and the assets would be physically tagged at the same time. I don't know who from NHS GGC agreed this.

a) Describe your post-handover knowledge, if any, of all contractual retentions; b) post-handover additional payments made to Multiplex by NHSGGC; and c) any additional payment for achieving energy targets/ BREEAM.

A I was not involved in the retention or post-handover payments so don't have any knowledge.

b) For clarity are you saying NHS GGC agreed that asset tagging would not be done by handover?

A Yes.

57. Did you consider it appropriate for the handover of QEUH/RHC to take place when the energy centre was not operational due to design issues? Did you appreciate at the time of handover that it would take almost a year before the energy centre was in a position to be brought online?

A The energy centre was operational and provided sufficient power, heat and cooling to satisfy the demands of the hospital so I did not see any issues or inappropriate for the handover to take place. The plant that was not operational was the three CHP Units (Combined Heat & Power units). The Boilers that were installed and operational at handover provided adequate amounts of heat to satisfy the demands

of the hospital which was confirmed by Wallace Whittle.
As noted above the energy centre was online at handover however I did not appreciate at the time of handover that it would take so long to get the MTHW system accepted by Zurich (written scheme of examination) and then the CHPs brought back on line.

58. The Inquiry understands that no validation was carried out in respect of the ventilation system of QEUH/RHC prior to handover. When did you become aware of this? How did handover come to be accepted without the ventilation system being validated? Who was responsible for this and who signed off on this?

A The ventilation systems were commissioned by Mercury / H&V Commissioning and ultimately accepted by Capita before handover. The systems worked in line with the design intent. Validation was a responsibility of NHS GGC.

a) Who agreed to proceed without validation?

A I don't know.

59. Describe Multiplex's involvement in works carried out following handover. Describe the nature of these works, whether remedial or new works, the cost and responsibility of payment of these works, details of who instructed the works and when.

A We were very involved in the works carried out after handover. The works consisted of completing some items of commissioning, defect rectification and various elements of instructed works. I was not involved in the payment and can't recall who issued instructions but instructions (Or Project Managers Instructions) were issued by NHS GGC.

60. Describe the build condition of the QEUH/RHC as at Final Defects Certificate (CI 43.3) Completion of Whole Works – Stage 3 Adults and Child's Hospital and Energy Centre dated 26th January 2017 **(Please refer to Bundle 12, Document No. 113, Page 848)**.

A By the end of the defects liability period I was less involved in the project and don't recall the condition of the building.

DMA Canyon

61. Prior to handover, who was the Duty Holder in respect of the water system at QEUH/RHC?

A I don't recall NHS GGC appointing a Duty Holder prior to handover but it may have been Ian Powrie. Mercury were responsible for the installation and commissioning of the water system prior to handover.

62. What responsibility, if any, did Multiplex have in respect of carrying out L8 testing prior to handover? If Multiplex had such a responsibility, was the L8 testing carried out and by whom, and where would the records of the testing be sorted? Were these records made available to NHS GGC?

A The ACoP L8 document provides advice on the control of legionella bacteria in water systems. Mercury carried out the testing and commissioning of the hot and cold water system in line with the ZBP/Wallace Whittle design, specification and guidelines such as ACoP L8 . The testing and commissioning included parameters that are defined in the ACoP L8 document such as temperatures for hot and cold water systems but also flushing as outlined in the SHTM. All testing and commissioning information relating to the hot and cold water systems was to be uploaded to Zutec (by Mercury). NHS GGC had access to Zutec. Regarding the L8 Risk Assessment, this was carried out by DMA Canyon who were appointed by NHS GGC.

a) Is the Inquiry correct to understand that the L8 risk assessment was to be pre-handover? If so, was it not the responsibility of Multiplex?

A. I don't recall if the L8 risk assessment was required to be pre-handover but expected it to be completed before patient occupation.

b) Who was responsible for ensuring these did not exist?

A. I don't understand the question

63. Who became Duty Holder when NHS GGC took handover of the QEUH/RHC site on 26 January 2015?

A I think Ian Powrie was the duty holder

64. SHTM 03 01 remains an obligatory part of the contract except insofar as derogated from. Is it not your/ Multiplex's job to ensure that what you/ Multiplex deliver complies with it?

A My role was to ensure that the commissioning was carried out in line with the approved design.

65. Do you have any further information that you consider relevant or interest to the Inquiry?

A No

Declaration

66. I believe that the facts stated in this witness statement are true. I understand that proceedings for contempt of court may be brought against anyone who makes, or causes to be made, a false statement in a document verified by a statement of truth without an honest belief in its truth.

The witness was provided access to the following Scottish Hospital Inquiry bundles/documents for reference when they completed their questionnaire/statement.

Appendix A

A43293438 - Bundle 6 – Miscellaneous Documents
A50091098 – Bundle 12 – Estates Communications
A47664054 – Bundle 15 – Water PPP
A47851278 – Bundle 16 – Ventilation PPP
A49342285 – Bundle 17 – Procurement History and Building Contract PPP
A52449706 – Bundle 43 Volume 1 - Procurement, Contract, Design & Construction
A52706440 – Bundle 43 Volume 3 - Procurement, Contract, Design & Construction