SCOTTISH HOSPITALS INQUIRY

Hearings Commencing
25 April 2023

Day 5
Tuesday, 2 May 2023
Colin Macrae

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11:40

THE CHAIR: Good morning, Mr Macrae. As you understand, you are about to be asked some questions by Mr MacGregor, who is the counsel to the Inquiry. But first, I think you are willing to make an affirmation?

THE WITNESS: Yes.

Mr Colin Macrae
Affirmed

THE CHAIR: Thank you very much indeed, Mr Macrae. Now, Mr MacGregor.

Questioned by Mr MacGregor

Q Thank you. You are Colin Macrae. Is that correct?

A Yes.

Q You have provided a witness statement to the Inquiry – a hard copy should be available to you if you need to refer to it.

A I have a hard copy here.

Q I will also bring any documents you need up to see in front of the screens in front of you. For anyone that is following in the electronic bundles, your statement is available in bundle 13 from pages seven to 54.

Now, Mr Macrae, the content of your statement is going to form part of your evidence to the Inquiry, and I am also going to ask you some questions today. If I just begin with your career, which you set out from paragraph 1 onwards of your statement. You tell us that you retired in March 2020. Is that correct?

A Yes.

Q Before that you were a mechanical engineer and a chartered engineer in building services and a member of the Engineering Council?

A Yes.

Q You worked for Mott MacDonald laterally. How many years did you work for Mott MacDonald for approximately?

A I think it was eight years.

Q What was your role when you were with Mott MacDonald?

A Building services engineer.

Q For those of us that do not work in the industry, what does your role involve in a day-to-day basis?

A Basically, I specialised in hospital design, construction – anything from mechanical, electrical, medical gasses, telecommunications, data. It's all rolled into one job.

Q So, you mentioned that it would involve mechanical and

electrical engineering design work. Is that correct?

A Yes.

Q In addition, you tell us at paragraph 2 of your statement that that would involve what you refer to as "reviewing operations and design information."

A Sorry?

Q You mentioned at paragraph 2 of your statement that your job would also involve "reviewing operations and design information."

A Yes.

Q So part of your job on certain tasks would be doing the design, but is what you are telling us at paragraph 2 almost the flip side that you could be in a different role effectively reviewing design information?

A Yes.

Q So if you were in that role of reviewing design information – just at a practical level – what would you be doing?

A You get documents submitted, design proposals, project co proposals and you would be going through them to see what was being proposed and seeing whether it was fit for purpose.

Q You mentioned within your statement that you had quite a lot

of PFI experience during your career?

A Yes.

Q Again, can you just explain what you mean by "PFI projects"?

A Private Finance Initiatives. The first one I did was King's College Hospital in London where I took it over from the builders and did the maintenance regime for the hospital, both breakdown and plan preventative maintenance.

Q That was King's College, so what were you doing? Were you doing the design work or were you doing the reviewing of the design work?

A That was the first PFI I was involved in, and it was the day-to-day operation of the hospital I was working on. I then-- where did I go from there? I went to some Fife schools for a while, then I went to the BBC in Glasgow to take the Pacific Quay building over from the builders and take it through technical fit-out. I then went from there to Balfour Beatty and the Fife Hospital Phase 3 where I was part of the SPV.

Q What do you mean by the SPV?

A The special purpose vehicle for the procurement of the PFI.

Q And on that project are

you working for the procuring authority or are you working for the bidding contractor?

A For the bidding contractor.

Q Thank you. You tell us within your statement at paragraph 5 about your experience of the breakdown in projects of this nature when they are being scored between price and quality. Can you just explain what your understanding of a standard price/quality split would be for the types of projects that you worked on?

A It varies between projects, and quite often it's 60/40, but it's not something I have ever been involved in because I'm doing the mechanical electrical engineering side of things. I very rarely get involved in the project management.

Q So you would have seen the documentation that set the scoring criteria, but you were not necessarily involved in advising on setting that criteria?

A Definitely not.

Q Again, just so I am understanding, in your experience it would not be unusual to see a 60/40 split between price and quality?

A No.

Q Again, today is not a memory test, so perhaps just in

fairness to you if we turn up your witness statement – it is bundle 13, page 8. Bundle 13, page 8. Do you see on page 8 there is the bold heading just above paragraph 5, "**The assessment criteria were based on a mix of price and quality with a 60/40 split in terms of price/quality. In your experience was this [un]usual?**" and you tell the Inquiry this was a norm----

A Excuse me a moment. I'm going to switch off my phone and turn up my hearing aids please?

Q Yes, yes, please do.

A And I've just realised I've not brought my glasses for computer work. I've switched it off. Okay, let's see if that's any better.

Q Thank you. Are you able to hear me all right?

A I was struggling, so turn these up and it should be okay.

Q Well, if there are any issues, please just do let me know because I can either keep my voice up or we can look to kind of alternative technologies. If there are any issues, please just do say.

A Yeah.

Q So, I was looking at just above the bold heading, paragraph 5, "**The assessment criteria were based on a mix of price and quality**

with a 60/40 split in terms of price/quality. In your experience was this [un]usual?" You say, "This is the normal way to assess these projects."

A Yes.

Q "The split of price and quality may vary. This decision would however have been taken [at] a high level by NHS Lothian. I had no involvement in this decision…"

A Yes.

Q Again, in your experience, although you have not advised on what the split should be, you have worked on other projects where there was a 60/40 split; it was fairly standard.

A Correct.

Q So, when you came in to work on the project for the Royal Hospital for Children and Young People, would it surprise you to see a 60/40 split being set out in those tender documents?

A No.

Q In the healthcare PFI projects that you talk about, could you assist the Inquiry with what type of briefing documents would you see a procuring authority providing? I would specifically be interested in your views about concepts the Inquiry has heard about room data sheets and

Environmental Matrices. What was your understanding of the sort of standard briefing documentation that would be provided by a procuring authority?

A It can vary, and it depends on the detail. I think-- I'm trying to think what happened in Fife. I think the-- because I've always worked with an Environmental Matrix. Every PFI I've done has always worked on an Environmental Matrix. I think in Fife the design consultants produced the environmental matrix and that was taken forward. It is the standard way, and it's only the engineering aspects of the room data sheets that go onto the environmental matrix as a quick and early means for the mechanical and electrical designers to get started before all the architects got all of the layouts done. It's just a faster way of doing it.

Q Because other individuals that have given evidence to the Inquiry have said that the standard briefing tool would be room data sheets produced using the activity database system. That is what would be produced by a procuring authority and provided to tenderers. Is that not your experience in the projects you have worked on?

A The projects I have

worked on, there may have been, because the architects produce the room data sheets, and they have the tool for doing that. I'm purely on mechanical and electrical, and rather than working with the masses of pages that room data sheets produce, it's split down just to the environmental matrix as a summary of the details that are on page-- I think it's page 3 and 4 of each room data sheet. So, it's just a summary, and it allows the mechanical and electrical designers to start work in a more-- in a quicker, more efficient manner.

Q So, again, just so I am understanding, your experience from a mechanical and electrical engineering point of view on a large-scale revenue funded PFI project, you would not be expecting to see room data sheets produced using the ADB system. You would be expecting to see an Environmental Matrix being produced and provided to prospective tenderers.

A Correct, but the Environmental Matrix is-- the source information comes from pages 3 and 4 of the room data sheets.

Q So you would still be anticipating that the information within an Environmental Matrix would come from room data sheets.

A Yes.

Q But the physical room data sheets, the large stack of room data sheets would not be provided to the mechanical and electrical engineers at the tender stage of a project.

A No., and if the architect changes a layout changes a room detail, adds a room or deletes a room, then that has to be-- he would amend the room data sheet, but he must tell the mechanical and electrical that that room has been altered so that the Environmental Matrix can be adjusted so that it's in line with the room data sheets.

Q Again, we will come on and talk in more detail about the Royal Hospital for Children and Young People and your work there, but it is not a matter of dispute that at the tendering stage room data sheets for every space in the hospital were not produced. Presumably, from what you are telling the Inquiry, you were not surprised by that when you came to work on the project because there was an Environmental Matrix.

A I wasn't surprised, no.

Q If I could just ask you some questions about your involvement within the project, and by that I mean the Royal Hospital for Children and Young People and the

Department of Clinical Neurosciences. What time commitment on a weekly basis did you have when you came in to work on the project?

A When I started, it was one day a week, and as it progressed, I could do some additional work in the Glasgow office. I was generally only through here once a week. Some weeks I didn't need to come through – there were no meetings – and then I could do other work in the Glasgow office.

Q For the one day a week that you were working on the project, what were you doing?

A Oh, it would vary from looking over ACPs, basically going through documents. They would just be passed to me to review, or I would be attending meetings.

Q Who would pass information or tasks on to you?

A Well, initially it was Maureen Brown, latterly Camille. Camille only was ever referred to by me as Camille and, basically, he would give me documents to review, and I would review them and give him back any comments that I had.

Q And at this stage are you the only mechanical engineer from Mott MacDonald that is working on the project, or are there other mechanical engineers?

A There was other -- I took over from Paul Curry who was dealing with the early stages because he was moving onto other projects, and I basically took over from him.

Q You took over from him, but were you the sole person dealing with reviewing mechanical engineering issues?

A No. Obviously, I would ask other people in the office to look over things because Mott MacDonald have a thing where it's a check-and-approve system that somebody has to go over responses so that it's a second check of what's being commented on.

Q So anything that you are reviewing, you are not the sole individual reviewing that. Is that correct?

A No.

Q And in relation to the one day a week that you are working on the project, you mentioned that there is a raft of issues that you would be dealing with. Approximately how much time would you be spending on ventilation-related issues?

A Ventilation was probably 10 per cent of my time.

Q You tell us that you joined the project when it was at the

competitive dialogue stage.

A Yes.

Q So, competitive dialogue, as the Inquiry understands it, is the period up to the appointment of a preferred bidder, and then you have the period from preferred bidder to the financial close when the contract is awarded.

A Yes.

Q Okay, but at that initial stage, from the point of competitive dialogue, you are obviously being provided with individual tasks but, at a practical level, what is it that you are doing on the project at competitive dialogue?

A It didn't really change. I was just reviewing documents and what was being bid, so we did have sessions where we discussed the different proposals from the different bidders.

Q And did that change from the point that the preferred bidders were appointed to financial close, or were you simply doing tasks allocated to you by the----

A I was simply doing the tasks allocated to me

Q One of the issues that is covered within your statement is Chief Executive's Letter 19 from 2010 or CEL19 2010, as it is often referred to

you. You tell us within your statement that that was not on your radar at that time, so when you were working on the project, is that a concept that was mentioned by anyone on the Mott MacDonald site?

A I wasn't aware of that letter.

Q Presumably you were not looking at tenders or any of the documents that you were being asked to review with CEL19 2010 in mind.

A Correct.

Q Do you know if there was anyone else working for Mott McDonald that would have had that issue, CEL19 2010, on their radar?

A I mean, I subsequently have obviously looked it up, and it's an NHS policy document. I wouldn't be able to comment if anybody else was looking at that.

Q Okay. If I could ask you to have your statement in front of you, please, so it is bundle 13, and if we could look to paragraph 8, please, which is on page 10. Do you see paragraph 8, beginning, "While I cannot recall…"?

A Mm-hmm.

Q You say:

"While I cannot recall all the details, at draft final tender and tender stage I would be asked to

review technical submissions from a mechanical and electrical perspective. In reviewing the bids, I would be focusing on what the bidders were proposing to design as a solution for the facility as a whole. I would be looking at the proposal, not just from a ventilation perspective, but also from the point of view of factors such as heating, medical gases, and lighting. By that early stage, the design had not been developed yet. Therefore, I would not be looking at whether there was compliance with SHTMs or with the many other applicable sources of guidance. Similarly, I would not be assessing compliance against the draft environmental matrix as the environmental matrix was going to be the bidder's document to develop."

Do you see that?

A Mm-hmm.

Q Okay. Now, if we go back and perhaps just pick a few those issues out. You tell us that at this early stage the design had not been developed yet. When would the design be developed?

A It's an ongoing process, and subsequently there can be a number of changes in the design process. I just see that it's an ongoing process, and the design development-- I mean, at financial close the Environmental Matrix had theatres missing. It had a clinical department missing. So that's all to be developed.

Q And at this stage you would not be reviewing any proposed solutions for compliance with published guidance such as SHTM 03-01.

A I would be looking at it and, at that stage, when it was at the bidder-- the tender stage, it was comparing the proposals from each of the bidders, and it wasn't a compliance. It was a comparison, as I remember it, but it's so long ago, the detail-- difficult to be precise.

Q That is completely understandable, but one thing I want to understand is you are obviously being asked to review documents, but whenever the tenders come in, so the tender assessment stage, one of the things that is set out within the procurement documentation – the invitation to participate in dialogue, the invitation to submit final tenders – is there is reference to various published guidance including SHTM 03-01, but when the bids come in you were not looking at the bids to see if there was

compliance of a solution with that technical guidance because, as I understand it, you are saying it was just too early to undertake that type of review. Is that correct?

A Yes, yes.

Q So, again, just so I am understanding, is that a general policy across Mott MacDonald that no one would be doing that because it would simply be too early a stage?

A It's probably not Mott MacDonald. It's my personal view that if the design is to be developed, the project co proposals are basically in draft form at that stage.

Q But at that stage, in terms of people passing you work to do, was anyone asking you to review any particular of the tender bids for compliance with published guidance such as SHTM 03-01?

A Not that I can remember.

Q Okay, and do you remember having discussions with any colleague that would be carrying out such a task?

A As far as I can recall, the reviews that we did, we did in group sessions so that it wasn't just the mechanical and electrical. It was architectural. It was the construction. It was right across the board in a group.

Q So, again, just so I am understanding that, you do not recall any of those types of discussions about whether there was compliance with published guidance such as SHTM 03-01----

A No.

Q -- but if that was taking place, you would expect to be at the meeting where such issues were being discussed.

A Yes.

Q Thank you.

THE CHAIR: Sorry. Mr MacGregor, just-- it is entirely my fault. Could you just take that last question and answer? I realised I had not really picked it up, my fault.

MR MACGREGOR: Yes, my Lord. So, again, do you want me just to paraphrase my understanding of what Mr Macrae had said, or do you want to go through the issue again?

THE CHAIR: Sorry. We were on paragraph 8.

MR MACGREGOR: Right.

THE CHAIR: I have just lost concentration.

MR MACGREGOR: I had simply been asking Mr Macrae about paragraph 8. I had been asking him about what tasks he was asked to do. Mr Macrae, as I understand it, told the Inquiry that he was not checking it at

this early stage when tenders were being assessed for compliance with SHTM 03-01. I then asked Mr Macrae some further questions about the process. Mr Macrae's answer to that was that, at that early stage, there were group meetings that took place. So, he does not recall any assessment being undertaken of tender bids complying with SHTM 03-01.

THE CHAIR: Right. Let us have the last point.

MR MACGREGOR: But if such a discussion had taken place, it would have taken place at those group meetings. So, as I understand it, his position is that he does not think anyone from Mott MacDonald was undertaking that assessment of whether tender bids were complying with published guidance, such as SHTM 03-01 at the assessment of tender stage but, again, no doubt Mr Macrae will clarify if my paraphrasing is right or wrong.

A No. That's correct.

THE CHAIR: Thank you. As I say, it was entirely my loss of concentration.

MR MACGREGOR: Mr Macrae, the next issue that I would want to ask you about is really just still within the stage that tenders are being submitted before a preferred bidder is being

appointed, and within your statement you make some comments upon a tender that was submitted by a bidder called Bidder C. So that is a different bidder to IHSL that got appointed. Do you have-- I appreciate it is a long time ago. Do you have any recollection of the process and reviewing the tender bid that was submitted by Bidder C?

A I'm afraid not. I just can't remember.

Q It might be helpful just to jog your memory, just to put in context some of the questions I am going to ask you if we go and look at some of the documents submitted by Bidder C but, effectively, Bidder C submitted an Environmental Matrix, but they changed a number of the figures within the Environmental Matrix itself and made some comments within their tender. At the time, would you have seen those documents, or would they not be the type of documents passed to you?

A I can't remember. I do know that it was brought up that Bidder C had marked up an Environmental Matrix, but my perspective-- my view on that was that that was Bidder C being proactive, marking it up prior to appointment as preferred bidder. It was something that has to be

developed again in the process, so it didn't give any alarm bells that Bidder C had been proactive.

Q So, if Bidder C has taken the Environmental Matrix issued to bidders and marked up different figures, that is not something that would be of concern to you or having alarm bells ringing at this early stage?

A No.

Q Again, just so I am understanding, can you just explain why not?

A Why? Because Bidder C had taken the stance of carrying out that work. The other bidders would have to do it later on.

Q Again, just in fairness to you, Mr Macrae, if we could have bundle 7 up, please, and look to page 56. This is the Environmental Matrix that was submitted by Bidder C. Bundle 7, page 56, and we will zoom in. It is very, very difficult to read the text, but you will see in the third box along there is "Department Sub Group," and within that there is "PICU - 8 beds," and then in the room name function, the final entry is, "Open Plan Bay (4" – do you see that?

A Yeah.

Q If you look along to the ventilation parameters, they are the first figures that are marked up in red.

You will see under the heading, "Supply ac/hr," that that's been changed in red to 10----

A Yes.

Q -- from the value that was there. Again, just so I am understanding, your position is that the fact that a bidder had taken this document and marked up values, that is not something that would leap off the page to you as being significant at this stage?

A No. Well, they're just being proactive. I'm not aware if in the tender document they were required to do it prior to preferred bidder stage, but it's something that should have been done by all parties.

Q Again, in fairness to you, I think you tell us very clearly in the statement that you had not been involved in drafting any of the procurement documentation, you were not familiar with the content of it and, again, this is not a criticism, but you were doing specific tasks that people asked you to do.

A Correct, yes.

Q Do you remember within your time on the project an issue cropping up in relation to single bed rooms within the hospital?

A Yes.

Q Can you just explain?

We will come on and look at some of the documentation but, in general terms, what was the issue that was identified?

A The issue was that the bedroom ventilation was being described as positive to the en suite, and that is not how the airflow is supposed to be categorised. The pressure regime from a single bed room should be stated relative to the adjacent space being a corridor, because all en suites have extract ventilation, which makes them negative pressurised to the room, the bedroom, hence making the bedroom positive pressure to the en suite. That does not tell you what the pressure regime from the single room to the adjacent space, i.e., the corridor-- you have no idea what that is, and that is the critical boundary for infection control.

Q Do you remember how that issue cropped up? Just, again, thinking over the fact that it really was not your role, or perhaps Mott McDonald's role, to be undertaking detailed reviews of whether there is compliance with the published guidance, how does that issue emerge?

A That was because, basically, it was in the Environmental

Matrix that the room was stated as positive to the en suite.

Q Is this at the preferred bidder stage this is spotted, or had that issue been identified at an earlier stage?

A That was at preferred bidder stage, yes.

Q Just in terms of the intensity of review that Mott MacDonald is undertaking, the types of tasks that are being passed to you, did that change in the period after when the preferred bidder is appointed?

A I think the detail got more focused, but I was the same. I was reviewing documents as it was passed to me.

Q When those documents were passed to you to review, issues like the single bed room issue got spotted?

A Yes.

Q They have not been spotted, as I understand it, at the tender assessment stage because things are just too embryonic, but has it changed by the preferred bidder stage, the preferred bidder to financial close? Is there a more forensic analysis being undertaken by Mott MacDonald and by you in particular?

A Probably, yes, because we're reviewing the different iterations

of the Environmental Matrix. We were looking for anomalies between bedrooms, but it was done at a fairly high level.

Q We will come on to talk about this in a bit more detail, but why is it being done at a very high level?

A Well, essentially, the Environmental Matrix wasn't being updated as I would have expected it because there was several anomalies, and the project co didn't seem-- they still claimed that their ventilation strategy was compliant.

Q Again, just so I am understanding things, anomalies get spotted, they get fed back to the preferred bidder, and those issues do not get resolved. Is that correct?

A Correct.

Q Was that a matter of concern to you as an engineer?

A It got more concerning, but that development went past financial close, so the detail was still being developed after financial close.

Q In preferred bidder to financial close, did you have concerns about-- I think what you have told us was a lack of response or lack of updating of the Environmental Matrix?

A Yes.

Q Did you escalate those concerns?

A Yeah. I know I did. I don't know whether it was done prior to financial close or after.

Q Okay, and in terms of the chain of command within Mott MacDonald, if you had concerns, who would you escalate those concerns to?

A To Graeme Greer.

Q To Graeme Greer. I would like to come back and just ask you a few more questions about the single bed ventilation issue that we have touched upon, and if I could ask you to have in front of you, please, within bundle 4, page 275. So, bundle 4, page 275. Document headed in the top left-hand corner, "Environmental Matrix Comments – 13 October 14." Do you see that? Two columns. One, "The Board has the following initial technical comments the draft 1 of the Environmental Matrix," and then we see the comments, "IHSL Update 27 October 2014." Do you see that?

A Which item are you----?

Q I was just, firstly, asking that you have got that document in front of you, so the Environmental Matrix comments from 13 October, and the next question I was going to say is: is this a document that you have seen before?

Sure. I've seen it in looking up, preparing for today. It's not in a format

that I recognise from the time of reviewing.

Q So, in terms of a collation, if you had a comment-- I think you said you were perhaps working with Graeme Greer. Is that correct?

A I recognise these comments, but not in this format.

Q Right, so----

A This is possibly a format that Camille's developed, but I do recognise the comments because, "…theater and DCN acute care… not included."

Q So, you say you recognise the comments. Is that because they are your comments or are these issues that you discussed with colleagues?

A I think they are my comments.

Q But this is not a document that was produced by you?

A No.

Q Thank you. If we perhaps just look down on to page 276, do you see entry 7, "Bedrooms 4ac/hr, SHTM says 6 ac/hr"? I will just give you a moment to bring that up. Do you see that?

A Yes.

Q It says:

"Bedrooms 4ac/hr, SHTM says 6ac/hr.

Bedrooms have no extract.

Bedroom en-suites 10 ac/hr, SHTM says 3 ac/hr.

Bedrooms stated as positive pressure, SHTM says 0 or –ve pressure.

The supply air to a bedroom has to be balanced with extract…"

And so it continues. Just in layman's terms, what is comment 7? What is that communicating?

A That is indicating that-- Basically, I produced this to try to explain to my colleagues what was wrong with the ventilation strategy, and it's probably not laid out very well but engineers always get criticised for that. So, basically, what we have there is a far higher extract rate from the en suite, and the explanation for that is the bedroom having no extract. So, if the bedroom has 6 air changes and the en suite has 3 extract, there is a massive amount of excess air in the bedroom, and it's normal that it's extracted from the bedroom as well as the en suite because the bedroom extract is classified as clean extract, which can go to heat recovery, whereas the extract from the en suite is deemed to be dirty extract and it goes outside with no heat recovery, and that was where the explanation for

that was coming from.

Q In relation to the balanced pressure regime, why are you flagging that?

A Because that's where the infection control risk is, but the infection control risk and the pressure regime is dependent on the clinical function of the area.

Q So, again, just so I am understanding, within the comments here we would see issues being recorded in terms of risks to infection prevention and control arising from potential non-compliance with published guidance.

A Yes.

Q That is being effectively fed back to the party that has been appointed as preferred bidder?

A Yes.

Q Okay. Can you recall what happens in relation to this issue? What comes back from the preferred bidder when this issue is raised?

A I think they still maintained-- they thought that the opening window was the solution and complied with the guidance to give a balanced output.

Q Did you agree with that response?

A No.

Q Why not?

A Because the Board had expressed a wish for the ventilation strategy not to include openable windows.

Q Do you know if this divergence in views got resolved?

A I actually don't know. I know that there was a-- well past financial close, but there was a series of meetings to resolve the bedroom ventilation.

Q So, again, if we perhaps just stick with the period preferred bidder to financial close, as I understand it in terms of the chronology, you identify this issue; it is then raised with the preferred bidder. They provide a response, which you do not accept from a technical issue in terms of addressing the infection prevention and control risk.

A Yes.

Q Do you know what happens next in terms of whether that gets resolved?

A Wallace Whittle TÜV SÜD produced a ventilation strategy document, and we had a meeting where they maintained the strategy of openable windows, and my recollection was that it rejected by NHS Lothian.

Q If I could perhaps just go through a couple more of the

documents. If I could ask you to have bundle 8 in front of you, please, at page 69. Bundle 8, page 69, which should be an email from Graeme Greer to Brian Currie dated 13 November 2014. Again, if we can zoom in because the text is quite small. You are copied into this email, but it is your colleague Graeme Greer that is sending it. It begins:

"Brian,

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

As discussed at the Environmental Matrix meeting we added the following comment to the Environmental Matrix, [and then do you see the bullet point?]

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

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

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

Do you see that?

A Mm-hmm.

Q So, again, just in terms of the chronologies, is this what you are talking about in terms of the issue arises, there is the meeting to discuss it, but your understanding is it is not resolved, certainly at this point in time?

A Correct.

Q Then if we look on to page 71, this is a note headed up, "Single bedroom ventilation." You see that?

A Yes.

Q Then just the final paragraph there, after setting out some of the detail, it states:

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

Do you see that?

A Yes.

Q Was that your view at the time in terms of the problem with the proposal?

A I believe so, yes.

Q Okay. Again, just so I am understanding this, so we are talking about the types of infection that you are concerned about is possibly things like MRSA or Norovirus, but you are not aware of exactly how this issue that had been flagged gets resolved?

A (No audible response).

Q You mentioned part of the proposed solution involved opening windows, and you tell us within your statement-- I will not turn up the reference, but you tell us that your preference as an engineer would be to have all mechanical ventilation in a hospital. Can you just explain, why do you say that from an engineering perspective?

A From an engineering perspective, if-- and although I have said in the whole hospital, it's the clinical areas, because if you have natural ventilation, you have no control over the environment, the air change rate, or whatever. In my view, it doesn't work. Hospitals that have natural ventilation, you find that they're very warm in the summer and cold in the winter if you're relying on opening a window to control your air change rate. So, by using mechanical control on the ventilation, it assures the air change rates.

Q Is that a view on which engineers might disagree? That is your view for the reasons you have articulated. Are there other engineers that might think natural ventilation or mixed mode was appropriate for various areas in a hospital?

A For various reasons, the SHTM says natural ventilation is allowed and designers use that to design. Obviously, there is a reduced cost for using natural ventilation but, from an operational perspective, in a clinical area in a hospital, if you want to guarantee the environmental conditions, my view is it has to be mechanically ventilated.

Q Again, just going back to something that you mentioned slightly earlier in your evidence, just returning to this idea of the single bed room, the ventilation, the pressure regimes, your recollection is that what NHS Lothian communicated to the preferred bidder was that, for that space, that there should not be any openable windows. Is that correct?

A Correct.

Q If we just look perhaps within bundle 8, please, to page 56. Bundle 8, page 56. Do you see an entry, "Re: Bedroom Ventilation: HAI Scribe Confirmation." Do you see that? Have you seen this type of document before? Do you know what this is?

A Is it just an email?

Q If you have not seen it before, please do inform us, Mr Macrae.

A No, I think I've seen it before.

Q Okay.

A If you're asking what format the document is----

Q It is not a communication that is sent by you, so you may not have seen it before, but it looks like it might be an entry on the Conject system, which was used to convey information backwards and forwards.

A Oh, it's off of something like Aconex?

Q Perhaps if you could just explain to the Inquiry, what do you understand the Aconex system is?

A Aconex was -- was it a database? Where correspondence could be passed back and forward and could be tracked. In fact, yes, I see the reference number is – if I can remember – Brookfield, Multiplex, CE, and an RFI number to it. So, yes, that looks as though it's off of Aconex.

Q Aconex being a method of communicating between one side and the other?

A Yes, the parties.

Q Okay. So, this is an entry from 29 January 2015. The message begins:

"Hi Ken,

Following your recent RFI, the Board respond as follows:

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

Do you see that?

A Yeah.

Q It continues:

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

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

Do you see that?

A Yes.

Q I appreciate that you did not send this communication, but was that effectively your view on the solution and the conclusion that NHS Lothian came to in relation to what was being proposed?

A I don't know if it was my suggestion. I do know that the view within NHS Lothian was that ERI was natural ventilation, which has a very poor environmental result. I think it was because of that that they didn't want an openable window as part of the ventilation strategy.

Q Again, just so I am understanding, you tell us that you were passed documents for review.

Do you recall whether or not this issue gets resolved at financial close and how the parties took account of such issues within the contract, or is that simply for others to deal with?

A I think this issue was still in place through financial close.

Q The next document I would ask to have in front of you, please, is in bundle 10, volume 1 at page 283. There is a document, top left-hand corner, "Healthcare Associated Infection System for Controlling Risk in the Built Environment (HAI-SCRIBE)". Do you remember, during your involvement in the project, being involved in any of these HAI-SCRIBE reviews that would be conducted by NHS Lothian?

A None at all. I was not at any HAI-SCRIBE meetings.

Q Okay. This is not to try to catch you out, but if we look on a few pages to page 285 – and I appreciate this is a long time ago – you see, in section 2, there is a heading, "consultation," and then if you look four lines up from the bottom of that box, there is a reference to, "Technical Advisor Colin Macrae." Do you see that?

A Yes.

Q There is a suggestion in a document, a long time ago, that you were consulted on an HAI-SCRIBE review. Is your position simply you cannot remember whether you were or you were not?

A Well, I have not been shown this since-- in preparation for today and-- I see this document. It does not appear to be a completed document. I believe it's still in draft format, but my comment would be, about the consultation, that consultation may have been in the office, just asking me about something, and I have not realised that I was being consulted for the HAI-SCRIBE purpose.

Q So, someone may have had a conversation with you----

A Yes.

Q -- but you certainly do not remember being involved in a detailed HAI-SCRIBE----

A No.

Q -- process? If I could just ask you, for as much comment as you can make, to look on to page 286, please, and to paragraph 2.2. You see there is an entry in 2.2, "Is the ventilation system design fit for purpose, given the potential for infection spread via ventilation systems?" Do you see that?

A Mm-hmm.

Q The box is ticked as,

"No." Do you agree with that?

A Yes.

Q We can put that document to one side. Thank you, Mr Macrae. Just drawing on your experience from mechanical and electrical engineering, one issue that the Inquiry is grappling with is an Environmental Matrix which says 4 air changes an hour when the published guidance says 10 air changes an hour. Can you help the Inquiry with what impact, if any, would it have from a mechanical and electrical engineering perspective if you were changing values in Critical Care rooms from 4 air changes an hour to 10 air changes per hour, in terms of the design of the ventilation system?

A The design would have to be redone. The plant sizes, the duct sizes would all increase. It would be quite a costly exercise, an increase in cost.

Q If I could ask you to go back to your statement, please, so bundle 13, page 34, and if we could look towards the bottom of paragraph 58. It is on page 34. So, I would like to pick matters up in the final paragraph on page 34. About halfway down that paragraph, there is a sentence, three lines in from the right-hand side, beginning, "It was up to the preferred bidder...". Just take a moment and let me know when you have found that. So, it is in the final paragraph, about halfway up, three words in from the right-hand side, "It was up to the preferred bidder…". Just a couple of lines below the bold text. "It was up to the preferred bidder to produce the design…" Do you see that? Did you find that passage, Mr Macrae? Beginning with, "It was up to the preferred bidder..."?

A Yes.

Q You tell us in your statement:

> "It was up to the preferred bidder to produce the design and to ensure it complied with the BCRs. I understood from colleagues such as Graeme Greer that the preferred bidder was reminded that they had this responsibility."

Obviously, this is a conversation you had with Graeme Greer a long time ago, but I think that issue may be controversial in terms of other witnesses. Can you just, to the best of your recollection, tell the Inquiry-- what was it Graeme Greer was discussing with you in terms of what he was telling the preferred bidder?

A Basically, the matrix wasn't complying with the SHTM.

Q Was there any discussion between yourself and Mr Greer as to what he had told the preferred bidder they had to do?

A I'm not aware of that.

Q You continue within your statement-- So, we are still on paragraph 34 of bundle 13:

> "I've been asked to comment on whether the issues with air change would have been spotted when room data sheets were produced. My recollection is that room data sheets were not made available to me for review prior to financial close. Issues with air changes might have been spotted when room data sheets were produced."

Do you see that?

A Mm-hmm.

Q Again, just so I am understanding things correctly, in terms of the tasks you were being asked to do, no one is providing you with room data sheets to review in the period----

A No.

Q -- prior to financial close. Is that correct?

A Correct.

Q But you think there is a possibility, if room data sheets had been produced and if they had been provided to you to review before financial close, you might have spotted some of the discrepancies----

A Yes.

Q -- between the Environmental Matrix, as at financial close, and the published guidance in guidance such as SHTM 03-01?

A Yes.

Q Would it surprise you to know that room data sheets or a range of rooms, including Critical Care rooms, had been produced by IHSL in the period prior to financial close?

A I wasn't aware of that.

Q Okay, but, again, given the role that you had, would that surprise you that they had been produced and they had not been provided to you for review?

A If I wasn't aware they existed, then I wouldn't be surprised. If I didn't know they existed, then I wouldn't be expecting to see them.

Q Again, this is really what I am trying to tease out, and it probably was not a well-phrased question, but you get to financial close and you have got the Environmental Matrix that you have reviewed. Is that right?

A Yes.

Q You have not been provided with any room data sheets at that point. Does that surprise you? In

terms of the chronology, in terms of-- You told us at the start of your evidence you get an Environmental Matrix and then at some point you get the room data sheets. I am trying to work out if you found it surprising, by financial close when the contract is being signed, that someone has not said, "You have got the Environmental Matrix that you reviewed. Here are some room data sheets to review as well." Did that surprise you?

A I didn't get room data sheets to review.

Q That is the point. You did not get them, so did it surprise you that you had not got them to review?

A No.

Q Why not?

A I didn't know they existed.

Q Right. Would you have expected them to exist at that point in time?

A No. I would've expected them to be produced once the design of the facility had been completed.

THE CHAIR: Sorry, my fault. If I followed your answer, you were not surprised that you had not been provided with room data sheets before financial close?

A I was not surprised because I didn't know they existed.

Q Now, I think Mr MacGregor then asked the question, "Did you expect them to have been available before financial close," and you answered that, "No." Maybe just tease that one out.

MR MACGREGOR: Yes. I think it has probably been a series of badly phrased questions on my part but, as I understand it, your evidence was you were not given any room data sheets to review, and you quite fairly say, "Well, if I did not know they existed, then why would I be surprised?" I think the issue that I was trying to tease out with you is whether that is a surprising thing. So, you tell us at the start, "I get the Environmental Matrix and that is what I expect to see. At some point, there will be room data sheets."

A Well, through the construction period, I was given a full set of room data sheets to do a check against their Environmental Matrix, but it was well through the construction period.

Q That is not happening before the contract is signed?

A Correct.

Q Again, just drawing on

your experience in the industries, is that surprising in any way?

A No. That happened in Fife. The room data sheets came out during the build period once the building design had been finalised, because even through the construction-- and one example that I remember was the Fife hospital had a Medical Assessment Unit and it had a Surgical Assessment Unit, and through the build, those two departments were merged into a Combined Assessment Unit. So the layout of that whole area, that floor, was subject to a change, but it had to be changed, and you expect that process to continue through the build period.

Q The next thing that I wanted to ask you about is the process that you were adopting whenever you were given a task, such as reviewing the Environmental Matrix. You tell us within your statement that you were not doing a line-by-line review. I think you described it as “spot checks” that you were doing.

A Yes.

Q Again, can you just help the Inquiry with-- why are you doing spot checks as opposed to doing a full audit of the Environmental Matrix?

A A line-by-line review would be time consuming and very

onerous, and the development of the Environmental Matrix was beyond financial close. I think it was Ref(? 03:18:23) 10 was to be a line-by-line review by Wallace Whittle.

Q Within your statement, you describe it as being “a very big job.”

A Yes.

Q Am I correct in thinking you were saying it is such a big job, it is not appropriate to do that before you sign the contract? You would do that at some point after you sign the contract.

A That’s not an opinion I have. I would not expect the detail in the Environmental Matrix to be finalised at financial close because there will, inevitably, be changes that will occur through construction phase.

Q Again, just so I am understanding you, you do not have the design fixed at financial close, so it would be a waste of time to do the detailed review. You wait until the point in the project after financial close when the design is fully set, and then you would do a line-by-line----

A Yes.

Q -- review? Am I understanding you correctly?

A That is also when the room data sheets would be finalised.

Q Okay. There is just one final issue that I would want to ask you about at the minute. NHS Lothian's position before the Inquiry is that there was, effectively, a transcription error within the Environmental Matrix which does not get picked up. Do you think, in terms of your involvement in the project, whenever you come in during the procurement exercise through to financial close, that there were any issues that could have been improved upon to try to avoid that type of issue cropping up on future projects of this nature?

A The biggest problem with these type of projects, in my opinion, is that the guidance is too open to interpretation, and the table of rooms within SHTM 03-01 is not comprehensive enough and doesn't detail the different clinical needs or patient needs, i.e. if you've got Critical Care, there may be a different factor involved in an adult's Critical Care to children's Critical Care, but also the terminology of both of those rooms where it's a Critical Care area-- In the past, that Critical Care area was like a Nightingale Ward, where it was an open plan area, and to prevent infection control, 10 air changes would be appropriate. When you come down to the modern Critical Care where

there are individual bedrooms, it may be relevant to reduce the air flow because you don't have the infection control risk because you have the boundaries of the room. It's my view, to stop this happening again, it's improve the guidance.

Q Thank you, Mr Macrae, for answering my questions. I do not have any further questions at this stage. Lord Brodie may have questions or, equally, there might be questions from core participants, but thank you.

THE CHAIR: I do not think I have any questions at this stage, Mr Macrae. What I am going to do is take a brief break to allow those in the room to consider whether they might have any questions. So, what I will ask is that you be returned to the witness room. What I have in mind is that we will be able to tell you one way or the other in about 10 or 15 minutes. So, if I could ask for your patience for just, what I hope, quite a short period of time. Thank you, Kirsten. We will rise for about 10 or 15 minutes.

(Short break)

THE CHAIR: Mr MacGregor.

MR MACGREGOR: Lord Brodie, there is just one point of clarification

that I have been asked to raise with Mr Macrae. I do not think it would be controversial. It is really just one very minor point, and I think that would conclude it.

THE CHAIR: You are content to deal with it?

MR MACGREGOR: I am content to deal with it.

THE CHAIR: Mr Macrae, I think there is perhaps just one matter, or no more than two matters, that Mr MacGregor would wish to ask you about.

A Okay.

THE CHAIR: Mr MacGregor.

MR MACGREGOR: Mr Macrae, it is just really a point of detail. You remember that when you were giving evidence, you mentioned the fact that the design was changing, so you would not expect a detailed audit of the design to be taking place until the point that it was fixed which, in your evidence, was after financial close. Presumably, you would agree that the guidance at all those points of the project – particularly the published guidance, SHTM 03-01 – it was fixed. It was not changing as the project developed?

A I missed some of that. Turned my hearing aids down again.

THE CHAIR: Can I just say, Mr

Macrae, I wear hearing aids myself, and I am very conscious of the problems with the technology. So, you have got your hearing aids, but it is a question of----

A Ramping them up.

Q -- just turning them up a bit.

A Sorry.

UNKNOWN SPEAKER: ---

A I'm sorry?

MR MACGREGOR: I am informed if you change your hearing aid to T, it should patch into the audio loop.

A They're NHS hearing aids. They don't have that function.

THE CHAIR: So, sorry, was I picking it up correctly? You can moderate the hearing aid with your phone?

A Yes.

Q Have you been able to do that?

A I've just done it, yes.

Q Right.

MR MACGREGOR: Thank you, Mr Macrae. I was just saying that you had given evidence about how the design changed over time.

A Yes.

Q That continued after financial close, and you would say that there should not be a detailed audit or

a line-by-line review until the design is fully fixed.

A Correct.

Q The simple point that I was wanting to put to you was during that design journey, the development, the underlying published guidance such as SHTM 03-01-- It is fixed. It is not changing. Is that correct?

A It's fixed. Yes, it's fixed because the guidance is fixed, and even if the SHTM changes through the construction period, it is still the guidance at the time of financial close that takes precedent.

Q Thank you very much, Mr Macrae. I do not have any further questions. Lord Brodie may or, equally, there might be applications from core participants.

THE CHAIR: I have no questions, and I take it that has dealt with the matter that was raised. Mr Macrae, your evidence is now at an end. You are free to go, but can I thank you both for your attendance this morning and the background work of preparing to give that evidence, which I appreciate is more than a matter of just turning up on a morning. So, thank you very much, Mr Macrae, and free to go.

A Thank you.

Q As I understand matters,

Mr MacGregor, that is the evidence for today.

MR MACGREGOR: Yes, my Lord. That would be the witnesses for today. It will be Mr Serkis and Mr Ballantyne tomorrow. I anticipate that timings may be similar to today, so I have tried to arrange for Mr Ballantyne to be available earlier than the afternoon slot to try to make best use of the time available.

THE CHAIR: We will sit at 10 or endeavor to do so. Thank you very much. We will see each other, all being well, at 10 o'clock tomorrow.

(Session ends)

12:53