SCOTTISH HOSPITALS INQUIRY

Hearings Commencing
25 April 2023

Day 7
Thursday, 4 May 2023
Stewart McKechnie

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9.30

THE CHAIR: Good morning, ladies and gentlemen, and good morning to those who are following our proceedings on the remote live feed. This morning, Mr McClelland will be questioning witnesses. I think, Mr McClelland, the first witness is Mr Stewart McKechnie.

MR MCCLELLAND: That is correct, my Lord.

THE CHAIR: (After a pause) Good morning. Mr McKechnie, as you understand, you are about to be asked questions by Mr McClelland, who is the counsel to the Inquiry, but before then I think you are willing to affirm.

Mr Stewart McKechnie
Affirmed

THE CHAIR: Thank you, Mr McKechnie. Now, we will take a break during the morning, maybe around about 11, but can I just stress this? You are in control of that. If you want to break a little earlier, we will do that. So, just feel free to indicate when you consider it is appropriate.

THE WITNESS: Will do.

Questioned by Mr McClelland

THE CHAIR: Mr McClelland.

MR MCCLELLAND: Thank you, my Lord. Could you please confirm your name?

A Stewart McKechnie.

Q Mr McKechnie, have you supplied the Inquiry with a witness statement?

A I have.

Q Do you have a paper copy in front of you----

A I have.

Q -- there?

A Yep.

Q You have. If you feel that you need to refer to that at any point when giving your answers, please feel free to do that. For those who are following electronically, the reference for that statement is at bundle 13, page 409.
Does your statement, Mr McKechnie, set out fully and truthfully your evidence on the matters that it addresses?

A Yes.

Q Is there anything in it that you think needs to be changed or corrected?

A Not that I can think of offhand, no.

Q Yes. Well, the Inquiry will proceed on the basis that the statement contains your evidence but, as you will appreciate, I have got some

additional questions for you----

A Of course, yeah.

Q -- today. If I could begin just by covering your professional qualifications and experience, you explain in your statement that you have worked as a mechanical and electrical engineer for 40 years or thereabouts.

A Yes.

Q Is that correct?

A Correct.

Q What qualifications do you hold?

A I have a certificate in Air Conditioning from Caledonian University. I am registered with the IEng CEI. I'm a member of the Chartered Institute of Building Services Engineers and a member of the Institute of Health Engineers and Estates Managers.

Q Okay. Thank you. We have heard that mechanical and electrical engineers tend to have a focus on either the mechanical or the electrical discipline. Is that correct?

A Yes.

Q And what is the case for you?

A Basically, I'm leaning towards the mechanical side.

Q Mechanical side, and is that the side of mechanical and electrical engineering which would deal with ventilation systems?

A It is.

Q In your statement, you give some examples of health care projects that you have worked on. Could you estimate how much of your experience has concerned health care ventilation?

A On those projects or----

Q Just your career as a whole.

A It'll be something approaching 20 per cent, just out the top of my head.

Q How much of that work has been as the designer of healthcare ventilation systems?

A I've always been involved in the design. We would be a team. I'd be working with a team. We would possibly be carrying out various assistance exercises to do that, but the actual strategy, etc., would be something I would be closely involved in.

Q Mr McKechnie, I am not sure if it is affecting others, but I am slightly struggling to hear you. I wonder if I might ask you just to-- if you could possibly speak up a little bit.

A Of course.

Q If you could. Thank you. That is much better.

THE CHAIR: The microphone should help.

MR MCCLELLAND: To what extent has your work involved responsibility for making sure that ventilation systems comply with applicable guidance such as Scottish Health Technical Memoranda?

A All of it on the design side, but less so on the actual operational side.

Q Has that work included compliance with guidance in the particular context of Critical Care or high-dependency wards?

A It has, yes.

Q How familiar were you, at the time of your work on the Sick Kids project, with SHTM 03-01?

A Reasonably familiar with it. I wouldn't know it off by heart, but I know my way around about it.

Q You refer, in your statement, to work done on the Queen Elizabeth University Hospital in Glasgow. What was your role there?

A I was involved on the technical advisor side for Greater Glasgow health board and, latterly, I was involved because the firm I worked for took on board the designers who were a London-based firm who went into voluntary liquidation receivership. So, I was involved at the

at the end of the Glasgow hospital.

Q Okay. So, to begin with, you worked as a technical advisor for the health board?

A Yes.

Q In relation to ventilation matters?

A Yes. So, all the mechanical engineering and the electrical engineering.

Q Okay, and at that initial stage, the design work was being done by somebody else. Is that correct?

A Yes.

Q Was an Environmental Matrix used on that project?

A I don't recall a matrix in the initial stages, but I believe there was a guidance matrix produced on Glasgow. I haven't delved into Glasgow for the purposes of this Inquiry.

Q When you refer to something as a "guidance matrix," what do you mean by that?

A I think Glasgow was an entirely different arrangement from Edinburgh. There was no reference design supplied in Edinburgh (sic) as such, so the----

Q In Glasgow, do you mean?

A In Glasgow, sorry. Yes, so the scope of the building which

would have informed the Environmental Matrix wouldn't be available at the early stage because the hospital at that time still had to be designed.

Q Okay, and do you recall who it was that produced the matrix on the Glasgow project?

A I'm sorry, I don't. I haven't looked into that.

Q Okay. Now, you explained that you joined the SickKids project in November 2012.

A Yes.

Q Was that as an employee of Wallace Whittle?

A Yes.

Q How long had you been with Wallace Whittle by then?

A Probably about 30 years.

Q Sorry, 30 years?

A 30 years.

Q Now, the names Wallace Whittle and TÜV SÜD have, in this Inquiry, at least to some extent, tended to be used interchangeably. It may be helpful just to take a moment to clarify that. Have I understood it correctly that, at the time of the Sick Kids project, Wallace Whittle were owned by TÜV SÜD?

A Yes. They had been purchased by TÜV SÜD, but retained the Wallace Whittle as a trading name.

Q Is it the case that the Wallace Whittle entity has, since the SickKids project, been bought out so that the companies are no longer connected?

A That's correct, yes. Just in the past month or so.

Q Okay. So, that is just a recent development?

A Yes.

Q Are you still employed by TÜV SÜD?

A Yes.

Q I think, in your statement, you say that is to help out with legacy engineering issues. Does that include issues arising out of the SickKids project?

A It does.

Q So, back to November 2012 when you joined the project, what was Wallace Whittle's role at that point?

A At that point, we were the selected designers for Multiplex.

Q Okay. So, you formed part of the IHSL bid consortium at that stage?

A Through Multiplex, yes----

Q Through Multiplex. What role did Wallace Whittle have at that stage? What were you engaged to do at that point in time?

A At the initial stage, we were basically providing details of our experience and our resources and assisting Multiplex with any technical queries which arose at that very early initial stage.

Q Right. In your statement, you set out some ways in which the SickKids project differed from the others that you had worked on, and I think the phrase that you used is that it was "probably reasonably unique." Do you recall saying that about it?

A I do, yes.

Q Yes.

A I still believe that.

Q Okay. The reference, for those who want to see it, is bundle 13, page 412, paragraph 7. In that context, you refer to there being a relatively advanced reference design and to the degree of direct engagement with end users. Could you just explain why, in those respects, this project was different from others that you had worked on?

A On others I had worked on, I was more used to direct contact, if you like, with the end user. Whereas, in Edinburgh, that direct contact had, I assume, already been carried out by the reference designers, therefore we didn't have the same input. The Environmental Matrix was,

in my experience, an early development of matrices. I was more used to the-- and this is where, again, we get crossed between the references with ADB or RDS sheets. It was more of a system I was used to working along with.

Q You referred, there, to contact with end users. Who exactly did you mean by "end users"?

A That would have been the clinical staff, where appropriate, but also the in-house engineering or FM teams who, in my experience, normally have some preferences on engineering elements.

Q Now, in these hearings, we are really concerned with the period up to financial close----

A Yes.

Q -- and not beyond.

A Okay.

Q The period beyond will be dealt with in other hearings, but in that period up to financial close, how much engagement did you have with the end users, the clinical staff and the in-house engineering staff?

A Apart from the presentation of the ventilation solution for the single beds, I don't recall any other interfaces with these people.

Q Okay. You refer, there, to the solution for the ventilation in the

single bed rooms. Is that the discussions which emerged reasonably close to financial close until the end of 2014?

A Yes, that's what I was speaking about. Yeah.

Q Okay. We will return to that particular topic. Now, NHS Lothian issued an invitation to participate in dialogue in March 2013, after which a period of competitive dialogue took place. Do you recall that?

A Yes, I do.

Q That culminated in the submission of final tenders in January 2014. I am going to focus just now on that period. So, March 2013, issue of the ITPD documents, up to January 2014, the appointment of the preferred bidder. What role did Wallace Whittle have in the tendering process?

A It was basically the preparation of a number of reports which detailed the strategies which were to be applied to the hospital in our interpretation of the relevant BCRs, the client's requirements. So, we would prepare them, forward them to Multiplex and, between Multiplex and IHSL, they were turned into formal tender documents.

Q So, to what extent were you familiar with the tender documentation that the health board had issued?

A On the engineering side, reasonably so because that was my main focus.

Q Can you recall which of the documents that you were particularly familiar with that were important for your role?

A I don't recall the titles, to be frank.

Q Would they have----

A There was the reference design, obviously, and the Environmental Matrix. They were probably the key documents.

Q And what about the Board Construction Requirements?

A Well, the BCRs covered-- The matrix was part of the BCRs, as was the reference design.

Q Yes, and were Wallace Whittle involved in the competitive dialogue process?

A Yes, we were.

Q And what was the nature of your role in that process?

A I attended quite a number of meetings with the representatives from the NHSL.

Q Can we take it that those were meetings concerned with the mechanical and electrical elements of the project?

A They were. Yes, they were. Any of the meetings I attended had an engineering element to them.

Q Were Wallace Whittle involved in the production of IHSL's final tender?

A Yes. We would have been. As I say, our conduit to that was via Multiplex.

Q Yes, I think you explained a moment ago that you would provide material to Multiplex, and then Multiplex and IHSL would put the tender documents together.

A Yeah. They would basically cut and paste or amend if they saw necessary.

Q Before the tender documents went in, were they run past you to see if you agreed with the term?

A I don't recall that. If there was any queries that either party had, they would have been referred back to us.

Q Was there a particular person at Multiplex that was your interface with them?

A Yeah, that would've been Ken Hall.

Q I am trying to remember when it was that Mr Hall became involved. I think Mr Hall's evidence-- I may be wrong about this, but my recollection is that he became involved at the start of the preferred bidder period. Do you recall who your contact was before then?

A I don't, actually. Ken's the one that sticks in my head, to be frank.

Q Now, as you mentioned, the documents issued by the health board included the Environmental Matrix, and in your statement, you say that you – and by that, I take you to mean Wallace Whittle – had no involvement with the Environmental Matrix prior to the appointment of the preferred bidder. Could you just explain what you mean by that, you had no involvement with it?

A The matrix, we took as a client's brief – which is my understanding of what the matrix-- or any Environmental Matrix is intended to be – therefore, we had no input into the figures that were detailed on it. It was later on down the line that the matrix came over to ourselves.

Q Okay, and so in that period prior to the appointment of the preferred bidder had you at least considered the Environmental Matrix?

A Absolutely, yes.

Q To what extent?

A We had reviewed the key engineering parameters such as the air change rates, the temperatures, the

air pressures, etc., to help us understand what the solutions were that we were going to be, then, designing.

Q And would that go down to the level of the individual rooms which are listed in the matrix?

A There's circa 2,500 plus rooms. The Environmental Matrix has got 20 columns. My mental arithmetic tells me that would be something like 50,000 entries on the document. So, no, we'd look at the key parameters, but there was a limit as to what you could do there.

Q How did you determine which of the parameters were key parameters?

A The key parameters were the parameters that would affect our final designs. As an engineer, I need to brief my team on the fundamental values that we are trying to achieve in performance terms on the ventilation, the heating, air conditioning, pressurisation, etc.

Q So, you mentioned there that you would have looked at the air changes and the pressure arrangements and so on. How would you determine which of the air change and pressure parameters you looked at? We will look at the matrix later on, and it provides those details on a

room-by-room basis. It also provides them on a, sort of, room category basis.

A Yeah. I mean, they tend to be the more common rooms: the bedrooms, the isolation rooms, the treatment rooms, something where there would be a commonality. We wouldn't have drilled down to individual rooms which were either of-- a kind of more standard, you know-- your interview rooms or staff bases, those kind of things, but the ones which would have the significant impact on the main plans and design are the ones that would attract our attention at that particular stage.

Q Would that include rooms which had specialised ventilation requirements?

A Yes.

Q Would you look at the parameters on a department-by-department basis because, again, the matrix divides the individual rooms into departments? Would you be interested and how ventilation was treated in different departments?

A We would tend to scan all of the documents. So, yes, we would have looked at it as we went through, and if there was an anomaly on a particular-- if there was something different on a particular department,

that, I would have liked to have thought, would have rang a bell.

Q When you say “rang a bell,” if you had picked up an anomaly like that, what would you have done with it?

A Well, we’d have reviewed it in-house against the guidance documentation to see if it aligned, and if we were uncomfortable with it or needed clarity on it, our recourse would’ve been to push that up line to Multiplex, who then take that into the chain to get it clarified.

Q Okay. Do you recall raising any particular anomalies arising from the matrix?

A I do, but it depends at what point we’re speaking about. At the early stages, we are not involved in a detailed design, so the clarifications that I recall were raised further down the line when we were actually in preferred bidder and when we were preparing our more detailed design, where we were looking at duct sizes and plant sizes, etc. So, in the early days, no, there was nothing.

Q So, if we try and divide it into phases. The competitive dialogue phase: do you recall having detected any anomalies or having raised any anomalies in that period?

A I don’t recall anything at

that particular stage.

Q Okay, and we will look a bit more closely at the preferred bidder stage----

A Yeah.

Q -- a little later on. Now, you will be aware, no doubt, that one matter of interest to the Inquiry is the compliance of the ventilation system with SHTM 03-01.

A Absolutely, yes.

Q Are you aware of that?

A Yeah.

Q And part A of SHTM 03-01, which is the part concerned with the design of healthcare ventilation, was first published, as I understand it, in February 2013, so just slightly before the ITPD documents.

A Yep.

Q Were you familiar with that guidance when you joined the project----

A With the SHTM 03-01? Yes.

Q -- or rather, when it came out?

A Yes.

Q Yes. Now, in your statement you refer to SHTM 03-01 as guidance and not always definitive. Are there some circumstances where the requirements of the guidance are definitive?

A Probably when you're speaking about specialised rooms, such as isolation rooms-- and operating theatres would be another one where I would treat the guidance there as definitive, where they'll speak about air changes and pressures.

Q If we could just bring SHTM 03-01 up on screen, please. The reference is bundle 1, page 149. As it happens, this is the version from February 2014, Mr McKechnie, but, as I understand it, it is materially the same as the 2013 version, at least for the parts that I am going to be looking at today.

A Okay.

Q So, the version that we have got on screen would be the applicable version for the preferred bidder phase. If we go to page 230, please. You see, there, that we are in section 7 of the guidance, which is headed up, "Specialised ventilation systems"?

A Yes.

Q Paragraph 7.1 reads, "This section contains design information for a range of healthcare ventilation applications." Paragraph 7.2, "The following departments will require a degree of specialised ventilation." If we look down that list, do we see that it includes-- the third bullet there-- it includes, "critical care areas and high-dependency units of any type"?

A Yes.

Q Then below that, do we see another bullet point for "Isolation facilities"?

A Yes.

Q We see that the "critical care and high-dependency units" are listed separately from "Isolation facilities." See that?

A Yes.

Q Now, if we go on to paragraph 7.3, it provides that:

> "Design information for many of these applications is given at Appendix 1 Table A1, Appendix 2, and in the following chapters within this section."

Then it says that:

> "It is not possible within this existing document to give definitive guidance for every healthcare specific ventilation application. Additional detailed guidance may be issued in due course in the form of supplements."

That appears to mean that there are some other applications for which guidance is not given in this document. Do you agree with that?

A Yes, that's correct.

Q Is that what you mean by describing it as “not definitive”?

A Describing the SHTM as “not definitive”?

Q Yes.

A In my mind, I was more referring to the fact that, in the opening paragraphs of SHTM 03-01, it states that it is a guidance document. Throughout the document, there are various alternatives which are given for design solutions. So that, to my mind, doesn’t make it a definitive style document. That was the point I was trying to get across.

Q Do you mean, by that, that there would be scope for a designer to depart from the recommendations in the guidance?

A No. I mean that, where you have a document which has alternatives within it, it’s not particularly definitive because you have to select one of those alternatives, and so it’s definitive within a band.

Q Would you describe it as definitive insofar as you have to choose one of the alternatives that it gives you?

A I would say, in any healthcare project, any designer would be using the SHTM guidance and using that as a basis for their design, yes.

Q If we could move forward, please, to page 287 of that bundle. Now, we see here “Appendix 1.” Would you understand that to be the appendix that we saw referred to in the text a moment ago?

A Yes.

Q As you can see there, it’s headed up, “Recommended air-change rates.” If we just look through that, we see, first of all, an entry in the first line for a “General ward.”

A Yep.

Q The recommended air change rate is 6 air changes per hour.

A Yes.

Q Do you see that? Then, in the column headed up “Pressure,” there is a hyphen or a dash. What did you understand to be the pressure recommendation for general wards?

A My interpretation of that is that there’s not a defined pressure. If you look further down the table, there’s actual pressure figures given of “-5, +10, +10.” They’re indicative-- The birthing room saying it should be negative, which is-- my understanding would be that that would mean that the extraction from that room was actually slightly more than the supply. So it’s notionally negative, but not to a defined figure.

Q Yes. Okay. So, what

might be construed as a subtraction symbol, or a negative symbol in the pressure column, you would take as meaning there's just no recommendation?

A I take that as meaning that it's not an applicable pressure to ward areas. I don't read that as a negative, given that where it states in the table that it's to be a negative pressure, it's prefixed with "ve".

Q Yes, thank you. If we read further down, you see the third entry there is for a "Single room." Again, the recommended air change rate is 6 air changes per hour and, there, we do have a recommendation for pressure of zero or negative. There has been reference to a balanced pressure arrangement. Would you take the 0 to mean a balanced pressure arrangement?

A That would've been my interpretation, yes.

Q Yes, and then further on down that list, about halfway down, you see the entry there for "Critical Care Areas"?

A Yes.

Q The recommended air changes are 10, and the recommended pressure arrangements are "+ 10." That is pascals. Do you see that there?

A Yes.

Q Then a little bit further down-- Sorry, in fact, just above it, there is a line there for "Neutropenic patient ward." Again, the recommendation there is 10 air changes per hour and a positive pressure arrangement of 10 pascals, yes?

A Yes.

Q Were those parameters that you were familiar with at the time you started your work on-- or from the time that this particular guidance came out in February 2013?

A Yes. That table is very familiar to me.

Q Do we see also in this table there is an entry about five or six-- I think it is-- yes, six or seven lines down for a "Ward Isolation room"?

A Yes.

Q Do you see that there?

A Yes.

Q There are no-- I mean, would you construe that as being that there are no parameters given in this table for----

A Absolutely not, because the reference to the right-hand side, which says to refer to "SHPN 4 Supplement 1," is an additional technical document which gives the full details of the ventilation and the rates

for that ventilation to be applied for isolation rooms.

Q Yes. So, that was really my point. I probably did not word my question very well. The reader is referred to that particular guidance----

A Yes.

Q -- but the parameters for those rooms are not given in this table.

A That is correct because they are contained within SHPN 4.

Q Would you understand that to be because the isolation rooms are the subject of more specialist guidance in that document that is referred to?

A I would say that is the logic behind having that document, yes. The one caveat I would put to it is that that document, SHPN 4, does not apply to isolation rooms in Critical Care areas.

Q Okay. We will maybe just return to that. So, just looking at the parameters that are actually given in this table that is up on the screen, do we see there that, for Critical Care areas and neutropenic wards, there are different air change and pressure requirements from the ones that apply for general wards and single rooms?

A Yes. I do, yes.

Q What is your understanding of the reasons for that?

A My understanding would be that both the Critical Care and the neutropenic wards-- you are using pressurised rooms to help protect the patients from the ingress of, normally, air from a corridor which-- or some other route for contaminated air to get to them.

Q Okay. So, that explains why you have got the particular pressure arrangements. What about the air change recommendations?

A In order to achieve a pressurised figure within a room, you normally need to put in more air because there will be a certain amount of leakage from the structure of that room, therefore a higher air change is normally required to help to overcome that leakage. The leakage then becomes a much lesser percentage of the amount of air that you're supplying into the room, and it helps you to get the 10 Pascals.

Q Okay. Do we understand from that that there is a connection between the number of air changes and the desired pressure arrangements within the room?

A Yes, that's my interpretation.

Q Okay.

A If you go to-- I don't know if it's on this table, but if you go

down to the operating theatres, for example, you're looking at 25 air changes, but there's a much higher pressure regime you're trying to achieve. There's 25 pascals, which kind of correlates with the air change rate.

Q Okay. So, by bringing more air into the room over a given period of time, you tend to increase the pressure of the air in that room relative to the----

A No.

Q -- surrounding spaces?

A By bringing more air in, it allows you to engineer the pressure within the room in a more satisfactory manner. There's always leakage from any room. Pressurised rooms will have different finishes in them, like the ceiling, for example, will be a solid ceiling not a lay-in ceiling like we have here. You'll have different light fittings. So, you do a lot of work on the building-- the room itself so that you minimise, but there will always be some leakage out of joints, etc. So, you can minimise the impact of that by increasing the air change rates.

Q Okay, and would the number of air changes also serve another function in helping to dilute any contamination that was in the air?

A Well, if you're

pressurising an area, I don't know where that-- I'm not a clinician, but I assume that you're referring to contaminated air coming from elsewhere in the hospital. By the very fact that you form a pressurised space, you prevent that air coming in so, in my opinion, it's more the pressurisation that's helping you to achieve that than the number of air changes.

Q What about contamination arising within the room itself – for example, infectious agents shed by a patient or something of that nature? Would the number of air changes help to dilute that as a risk factor?

A Again, I'm not an expert in that. The only thing I would say is it would possibly dilute it as a risk factor for the staff but not the person themself.

Q Assuming it was a single occupancy.

A If it was a-- Yes, yeah. Well, even if it was a multiple occupancy room, I don't see a huge air change rate having that much of an impact on airborne contaminants.

Q If we just have a look at page 232 of that bundle, and this is still the chapter of the guidance on specialised ventilation, at paragraph 7.6, what it says there is that, "The

supply of air to a room has four main functions: to dilute airborne contamination; to control air movement within such that the transfer of airborne contaminants from less clean to cleaner areas is minimized," and then there are also references to other purposes. That tends to suggest that the supply of air is partly intended to dilute contamination that is within the air. Would you agree with that?

A Well, I think common sense says if you have air coming into a room, you will dilute any contaminant within that room itself. Therefore, the more air you put in, presumably, the more you will dilute it, but I don't necessarily read that across to the 10 air changes for the isolation rooms.

Q Well----

A I think that's more in general.

Q As I understood it in general terms, your understanding of the reason for different ventilation parameters in Critical Care and High Dependency rooms was, essentially, about the protection of the vulnerable patients you might expect to be treated there. Is that----

A No, sorry. Sorry, my description there was solely about isolation rooms, and that's an isolation room in any particular area, not restricted to the Critical Care Areas.

Q If we go back to table A1, which is page 287, what we see in this list is that there is a particular line entry for isolation rooms.

A Yes.

Q That is the seventh line down and then, separately from that, there is a line entry for "Critical Care Areas."

A Yes.

Q Well, if you just answer this question: does the fact they are given different lines not indicate that the details given there for Critical Care cannot be confined to isolation rooms?

A In the first instance, I don't believe so. The reference to the ward isolation rooms, which is to SHPN 4, Supplement 1, does not include for the geometry of an isolation room within a Critical Care area. Therefore, my reading of that is that that's guidance for specialised rooms in the Critical Care area. I cannot see how that could be applied as a, let's say, blanket design parameter to all of the rooms within the Critical Care department, which has a whole host of different rooms.

Q So, if we look at the line for Critical Care, and if you look along to the end of that line, there is a comment that reads, "Isolation room

may be -ve press."

A Yes.

Q So, does that not indicate that an isolation room is just one example of the Critical Care areas governed by the recommendation that that line makes?

A I really don't read it that way, because if you are suggesting that, again, that 10 air changes and +10 pascals is intended to be applied in every single room that constitutes a Critical Care ward, I don't see that as being a practical solution, and it's certainly not the solution that's applied to the majority of Critical Care wards that I have reviewed.

Q Why do you say that's-- I think your words were, "not a practical solution" to apply that across the whole of the Critical Care department. Why do you say that?

A Well, the Critical Care department of its very nature includes other standards of rooms such as: nurse spaces, interview rooms, clinicians' rooms, the whole host of different forms of accommodation. Within the Critical Care area that we're speaking about at Edinburgh, there was defined isolation rooms within that ward.

Q What the line actually says is, "Critical Care Areas." Is it

open to the interpretation that a Critical Care area is a patient area within the Critical Care department?

A I don't believe that to be the case that it's solely patient areas, and I'm basing that on: my reading of the documentation that we're speaking about; the fact that the isolation rooms were called out separately within the Critical Care Ward; and also, within the Critical Care Clinical Output Specification, which is a bespoke document for the Critical Care Area, I can find no other reference to pressurised rooms, which is what we would be speaking about, other than the isolation rooms within that Critical Care ward.

Q I mean, I appreciate I am not an engineer and you are, but if one just stands back and looks at this table, it might appear to be quite a clear recommendation that if the room in question is for the purposes of Critical Care, it is to be given 10 air changes per hour and a pressure arrangement of +10 pascals, but you disagree with that interpretation of this table?

A If you're suggesting that that table applies to all patient areas within a Critical Care ward, I don't read it that way whatsoever. As I say, there's a whole host of different forms

of accommodation within that particular ward, but we've taken and clarified-- Now, again, we're moving a wee bit away from your timeline, but we had taken and clarified that the rooms which we had treated with 10 air changes and 10 pascals-- that it was a correct interpretation.

Q Okay, so if we take this line "Critical Care Areas… 10ac/hr… +10 pascals," if you start with the Critical Care department as a whole, you would exclude office areas and nurses rooms and so on. You would certainly exclude that from the requirement of 10 air changes per hour and positive pressure arrangement?

A It's not I personally would exclude them. I don't believe these areas are designed as pressurised areas, which is what we're speaking about.

Q Yes, so you would say that these sorts of rooms within a Critical Care department would not be designed to have these pressure parameters and air change parameters? I am just trying to understand what you are saying.

A In a global sense, yes, I would include them in the areas which I wouldn't expect to be designed, but not exclusively. I don't necessarily see that other forms of patient

accommodation would have to be or was intended to be pressurised accommodation.

Q Okay, so that was going to be my follow-on question.

A Oh, I beat you to it.

Q So, the parts of the Critical Care department where patients are to be housed and looked after, your view is that 10 air changes per hour and 10 pascals of positive pressure are not always needed for those patient areas. Is that a correct understanding of what you are saying?

A That's correct, yes.

Q Again, I am going to say what I have understood you to mean. The area that you would say has to have these air change and pressure arrangements is specifically only isolation rooms within the Critical Care department?

A Yes.

Q That is your understanding of what this guidance requires?

A It's my understanding of what the guidance requires. It's also my understanding of what the client brief required for Edinburgh.

Q I explained to you earlier that we are concerned with the period up to financial close. I appreciate there is an element of unreality in that

because real life has happened in the meantime, but if you take yourself back to the period prior to financial close, was that the interpretation that you had of this guidance at that time, or is it an interpretation that you have developed since then?

A It's the interpretation I would have had at that time, and I don't recall-- this is the difficulty, because there was a lot of discussion post-financial close. So, trying to restrict the comments to pre-financial close, I don't recall it being a specific item in any of the discussions that I was involved in pre-financial close. Any discussions on this, from my memory, happened further down the line.

Q So, would it have been necessary for you to form that particular interpretation of the document in the period prior to financial close, or is it perhaps something that you would not have had to think about?

A You know, up to pre-financial close, what we're trying to get normally sorted out is the strategies of what we're applying, "Can we fit into the building the necessary plant that we need to provide the heat and cooling, ventilation, etc., and pretty critically, the cost?" So, at that point,

we're not drilling down into detailed design. That's the next stage for me.

Q Do the detailed ventilation parameters, for example, pressure arrangements and number of air changes, have an impact on the type of equipment that is installed and the room----

A Almost certainly, yes. Yes.

Q If you are trying to work out the strategies and the cost and so on, you do not need to have formed a clear view about what the ventilation parameters are going to have to be?

A Yes, which I believe we had and which was in accordance with what I'm suggesting, which was that isolation rooms would have been taken as separately engineered areas.

Q Okay. So, again, if we just stand back from the guidance, if you, as a mechanical and electrical engineer, are told that there is a patient treatment room or a patient accommodation room in Critical Care or a neutropenic ward, for that matter, and that it is to comply with SHTM 03-01, can you, as an engineer, tell from that alone whether the room in question should have 10 air changes per hour and 10 pascals of positive pressure, or do you need more information than that?

A I need more information than that. It doesn't fall upon ourselves to define rooms as isolation rooms. They would be part of the accommodation schedule, which would have been normally developed as part of the discussions on the requirements for that particular ward.

Q Is that because, in your view, the number of air changes and the pressure arrangements required would depend on clinical considerations, such as the sort of patient who was going to be cared for there?

A Yes, that's what I would expect, because it doesn't fall on an engineer to define whether a particular-- there will always be a mix of people, but what that percentage mix would be-- who would require the extra protection, let's call it, of an isolation room. It may be someone who's-- well, neutropenic patients are an obvious example, who have a low tolerance to other diseases, but it may also be somebody else who's in a critical condition who would react badly to additional infection, whereas I would assume that there's other people in Critical Care who their condition does not require them to have that same high, enhanced standard of protection.

Q If I can perhaps put it the other way around, if a room is in the Critical Care department, again, a patient accommodation room or a neutropenic ward, and something less than 10 air changes per hour and 10 pascals of positive pressure is specified, would you, as a mechanical and electrical engineer, look for some explanation for that?

A I'd like to think I would look for an explanation if it didn't accord with the recommendations of the SHTM in terms of air changes and a defined air pressure.

Q Just before we leave this table, we have already looked at the lines: one for general ward and one for single room.

A Aye.

Q What is the difference between a general ward and a single room?

A A general ward I would have taken to be more like a conventional ward, bearing in mind that this document and the tables probably relate back to periods before we had the general guidance from Scottish Government for single bed accommodation for all patients. So, to me, that would be like a more conventional style of ward.

Q By conventional style of ward, what do you mean?

A Multi-occupancies.

Q Multi-occupancies. So, more than one patient?

A Yes.

Q If you could go, please, to bundle 5 at page 376. I think you referred, a moment ago, to the Clinical Output Specification for a ward or department as being something relevant to your job as a mechanical and electrical engineer. Is that right?

A This document?

Q No, just in general. Clinical Output Specifications, are they relevant to your work as a----

A They're relevant where they call out for specialised engineering solutions, yes.

Q Okay. Now, this particular one that is up on screen is the one from the Project Agreement, and you see at the bottom there it is dated September 2014. There is a materially identical version from January 2013, which I understand was issued with ITPD documents. Is this a document that you would have seen or considered when you started work on the project or, rather, after they had been issued by the Board?

A Yes, we would have reviewed these documents in order to see if there were any particular engineering requirements. I have reviewed this document, and the only reference I can find to pressurised rooms within it references isolation rooms.

Q Okay. So, I mean, would you understand that, more broadly, the purpose of these documents is to set out the functionality that the Board wants from a particular department – in this case, the Critical Care Department.

A Yes, I could understand that but, and I will stress the "but," I'm not a clinician and I'm not medically trained. I am an engineer, so I can only address engineering matters.

Q Okay. If we just begin by looking at some of what this document says? If we can move over to page 377, please, you will see that it opens up with a heading "Critical Care":

> "The department will provide a comprehensive critical care service this includes Paediatric Intensive Care (PICU), High Dependency Unit (HDU) and Surgical Neonatal Unit for children and young people up to their 16th birthday [and so on]."

Then just below that, under the heading, "Scope of the Service":

> "The main objective of

the department is to provide excellence in medical, nursing and paramedical care to patients who require intensive care and high dependency care."

So, that is just really putting the purpose of this department into its context. You see that?

A Yes, yeah.

Q Now, if we go on to page 387, please, we see, there, a heading of "Facility Requirements," and just below that, "Clinical Facility Requirements," and do we see there a list of what might broadly be described as the bed areas for the Critical Care department?

A Yeah.

Q Do we see that one of the items on the list is an isolation cubicle and there is to be four of those---

A Yes.

Q -- but, otherwise, there is no label of "isolation room" or anything attached to the other ones?

A Mm-hmm.

Q Is this the point that you that you regard as being significant, that these four cubicles are marked out for isolation purposes?

A From an engineering perspective, yes.

Q Yes, and then if we go down, please, to page 388, do you see the heading "1.8 Environmental and Services Requirements"? See that?

A Yes.

Q Would this be a part of the document of relevance to your role as a mechanical and electrical engineer?

A If it gave engineering advice, but that terminology of environmental and services you'll see covers things from floor covering, so it's not an engineering environment; it's much broader than that, the requirements are detailed in there.

Q The phrase that you used a moment ago was "engineering advice."

A Engineering advice.

Q Would you accept that the point of this document is for the Board to set out its requirements for the department, and that the engineers have to respond to those requirements by identifying what is needed to meet them?

A If they're specialised engineering requirements, then yes.

Q Or if they are uses to which the Board wants to put the department, which are matters to which engineers can respond. Do you accept that?

A I'd accept that in the normal accepted terms, which are-- as we are speaking particularly about pressurised rooms, I would expect within this style document for those rooms to be detailed, not for an engineer to translate whether a single room, which there are as part of the accommodation, had to have an enhanced engineering solution.

Q If we just go over the page. So, it is still part of the same list of "Environmental and Services Requirements," page 389, please, and if you could go to the fourth bullet point on that page, Mr McKechnie. Do you see that it reads there:

> "Flexibility in the use of Critical Care beds for both High Dependency and Intensive Care is key to maintaining efficient use of high specification beds. All three Critical Care Areas must be co-located."

A Yeah.

Q Then four bullet points further down from that, it says:

> "All PICU and HDU bed spaces are required to be of the same specification to allow greatest flexibility of use."

Do you see that?

A I see that, and I also see the paragraph above, which calls out specifically lobbied single bed isolation cubicles, which is an engineering guidance.

Q Yes, so the one above there reads:

> "Lobbied single bed isolation cubicles are required for both source and protective isolation of patients and they all require to have identical design of pressure control with positive pressure lobbies with filtered air, and negative extraction cubicles."

So, that is something that you would pick up on as a mechanical and electrical engineer?

A That's an engineering guide. Yeah, that's an engineering requirement, which we would have picked up on, yes, and that's where I'm referencing the fact that there are specific sleeping accommodation which is identified as isolation accommodation.

Q If you look at the other two points, the ones that we read out a moment ago, would they also be relevant to your job as a mechanical and electrical engineer?

A I don't see the relevance of the PICU and HDU bed spaces as an engineering term. My interpretation

of that would have been that it's more to do with the layouts and possibly the fittings-- the general fittings and fitments within the rooms themselves. In my opinion, that's not an engineering guide.

Q Would you accept that what these bullet points indicate is that the Board wants to maintain flexibility in the way that the bed spaces are used?

A I can understand that, but I don't see how-- if you had wanted to have that type of flexibility to, let's say, have any room as an equivalent of an isolation room, then you would have to design the room itself and its layout, from there, with an associated lobby. The architecture would have to have addressed that if you were applying that “without filter” across board.

Q These would be matters for the designers of the hospital?

A They would be matters for the designers, but they would also be matters, I would have said, for the briefing as well.

Q What the Board is saying it wants from this department is the ability to use the bed spaces flexibly, and what it says, in terms, is that they should be of the same specification to allow that to happen. Just in general

terms, would you, as an engineer, understand what the Board is saying there?

A Yeah. I have my own interpretation, which I think would be that they are looking for the actual furniture, if you like, and the beds within the rooms to be able to move about, but it's not a logical step for me to move from there to making all of the rooms within the PICU and HDU as pressurised accommodation. It’s an entirely different engineering solution.

Q So, when the second of the bullet points we looked at says that all PICU and HDU bed spaces are required to be of the same specification, you would read that as excluding specification insofar as it is a matter of mechanical and electrical engineering?

A I must say, I'm neither a hospital architect nor a clinician, but my layman's interpretation of that would be that they wanted the same furniture arrangements within all of the rooms, such that they could move them about, swap them about, so it was all to a same standard. I really don't read that as also referring to the environmental conditions within those rooms.

Q I mean, is that the case even though the list comes under a

heading Environmental and Services Requirements?

A The only environmental guidance I'm taking from there, and maybe some more on lighting levels or whatever, is to do with the-- it'll all be single bed isolation rooms.

Q Okay. I think we have probably said as much as we can about that document just now. In your statement, you describe the Environmental Matrix, and I think you have perhaps done it this morning too, as having been from the outset the Board's brief setting out its mandated requirements for the ventilation system, amongst other things.

A Absolutely.

Q On previous projects that you had worked on, had you come across an environmental matrix being used for that purpose?

A No. I'd been more used to working with the end user and having the-- well, I would term them as room data sheets, with the environmental conditions, such as the temperature, the air change rates, etc. within there.

Q What was your experience about the way in which those room data sheets would be pieced together with the various parameters in them?

A The room data sheets tended to be developed along with the end users, but they would have contained probably not just as much, but the more important pieces of environmental design information that I'd be looking for. In a hospital such as the size that we're speaking about, it becomes quite a task to manage all of that for a designer because a room data sheet would probably run to three or four pages for an individual room. So, in order to get to your design parameters, which the engineer needs in order to build up the engineering picture and performance of, say for example, a ward, you would have to extrapolate that information down into other-- you know, your own worksheet. The use of the matrix, in my opinion, was to avoid doing that and present it all in an easier to read and it should have been a more robust format.

Q You are saying that you saw the matrix on this project as being the client's brief to you, amongst others, about what it wanted. How did that differ from the way in which you were briefed on other projects?

A As I'm saying, the other projects would tended to have been developing up with the end user. Where we were, and bearing in mind that this was a relatively new process,

to go out to tender on a design for a hospital. Whereas normally there would have been a design which had been developed by the particular hospital themselves, and then that would have been pushed out as a tender enquiry. But in this style of hospital, where your tender is also including the design of the hospital, that's where the fundamental difference comes in.

Q Yes. So you are referring there to the reference design?

A Yes.

Q On the other project, I think you said that you were used to dealing with room data sheets.

A Yeah.

Q Was your prior experience that you would be issued with a set of completed room data sheets, or was that something that you would have to work with the client on to produce?

A We would-- It was a mixture, to be honest, on different hospitals. With some hospital projects, the in-house team, if you like, would have developed the room data sheets, but on a large development such as what we're speaking about, I would have expected that there would be a degree of working alongside the

people we spoke about earlier to produce and capture the environmental design conditions within those room data sheets.

Q So, if we boil that down, there are really two differences about this project. First of all, that you were not involved in that direct engagement with the end user to identify what their wishes and requirements were – is that one difference?

A Yeah. As I said in my statement, Edinburgh was probably – in my opinion – a bit unusual inasmuch as there had been a lot of work or certainly a lot of time spent on the developing it for what I would have termed would be a conventional tender arrangement. Then, that was then flipped to the-- let's call it a design and build, and that reference design, my understanding of that was that that was what had been developed by that reference design team along with the end users.

Q Have environmental matrices become more common since then as a means of briefing?

A They have, yes. Certainly because they are-- I wouldn't say easier, but they are a more definitive style of tool for passing onto people what the requirements for the particular rooms are, and it's also

easier for designers to pick up and use as a tool for the design.

Q And when you say easier to use, you mean easier than a whole pile of room data sheets for each room.

A Well, as I say, I mean, if you've got 2,500 rooms, you get 2,500 potentially four or five-page documents to then go to, which contain everything from the furniture, and through. So you need to through them and then get to the environmental part and go, "Yeah, so many air changes." As a designer, you would then scribble that down in your own worksheet to allow you then to develop the design, but when you're designing, for example, a ventilation system, you don't design it one room at a time. You need to compile all of the performances that's required for that suite of rooms, for example, and then turn that into air change flows.

Q So, again, on those subsequent projects where environmental matrices have been used, are you typically presented with a completed one or are you engaged with the client in working it up into a finalised form?

A I would say where it was a design and build style project, we would typically be presented with it.

Where we were the Health Board's-- let's call it designers, we would be in the position of helping compile that along with their representatives on engineering or, if necessary, clinical advice.

Q Yes. We have been talking about generalities there, but returning to the Sick Kids project, were you aware when you joined it of the Scottish Government's requirement for health boards to use the Activity Database for briefing their project, or at least an alternative of equal quality and value to the Activity Database?

A At that particular time, no, I wasn't particularly aware of that. The production of the room data sheets tends to be-- in my experience, it's architecturally led. So we would then be a contributor to a section of the room data sheets, not the whole room data sheet itself. That would tend to be owned by the architect.

Q When you say "contributor," do you mean the architect would give you the----

A We're only interested in the engineering part.

Q What would you receive from the architect?

A Well, the architect would have developed the layouts. They would have compiled the furniture, for

example. The equipment that's going into that room tends to be listed in the room data sheets as well, and then there is a section for environmental guidance, which is the portion that we would be involved in.

Q It may not matter, but how would that work in practical terms? Would the architect give you that sheet and ask you to look it over and suggest changes, or would he just ask you a general question and fill in the sheet themselves?

A Depending on which architect it is, it varies, but the majority of architects would pass the sheet with the environmental portion blank for ourselves to give them the necessary information.

Q My understanding is that if you take room data sheets from the Activity Database, they come pre-populated with certain parameters to reflect guidance. Is that correct?

A Yes, yes. That's my understanding as well, but I also understand that when you download them—because they are from a service provider, but they're not necessarily up to date with the current guidance, therefore they need a degree of filtering to be done on the—let's call them the downloaded ADB sheets.

Q How extensive do you understand that issue to be? I mean, are we talking about something that happens infrequently for the odd data sheet, or is it a kind of----

A I'm not the guy to ask that, to be honest, because it would be the—let's call it the author who would be more experienced on these sheets coming down and whether they were current. We would view the environmental part of it to ensure that it related to current guidance.

Q So, within your particular experience of these, would you typically be receiving a room data sheet pre-populated with the data from the Activity Database?

A If it came from that source, then yes. I believe the environmental conditions would come down already populated but not necessarily up to date, or not necessarily corresponding to up-to-date guidance.

Q So would your job, the engineer's job, then be to go through the parameters and make sure that they did comply with the up-to-date guidance?

A Pretty much, yeah.

Q Or, alternatively, to refine them to reflect what the client wanted?

A Well, we'd either refine them or we would refer it back to the client and say, for example, you know, "The current ADB sheet stipulates such and such. The current guidance stipulates an alternative. Well, are you clear on which one you want, or let's clarify it and have a bit of discussion on that and get them up to date."

Q Okay. We will return to the matter of the particular room data sheets for this project a little later. This line of questioning began with a question about your awareness of the Scottish Government's requirement to use the ADB as a briefing tool, and I think you said you were not aware of it at the time you began on the Sick Kids project. Do you recall at any time on the project becoming aware of it and, if so, did you form a view on whether the Environmental Matrix was of equal quality and value to the Activity Database?

A I don't recall a moment in time where I had a eureka moment and discovered that particular document. I have become aware of it through the Inquiry, but the Environmental Matrix as provided to us defined it as being produced as an alternative to ADB sheets on the very first issue I ever saw of it. So, at that point in time our focus would have

moved away from expecting to receive ADB sheets to focusing on the figures we were given in the matrix.

Q You said there that it had been supplied as an alternative to ADB sheets. Are you referring specifically there to one of the guidance notes that appeared on the matrix?

A Absolutely, yes.

Q Right. So, I mean, is it fair to summarise it in this way: that you do not recall giving explicit consideration to whether or not the matrix was equivalent to the Activity Database, but you were content with it as setting out the information that you needed. Is that a fair summary of it?

A I was content that what I had presented to me was a sufficient client—or, yeah, a sufficient client brief for my engineers and myself to go forward with our designs.

Q So your interpretation or your understanding of the Environmental Matrix that it contained the Board's mandated requirements, how was it that you came to that view?

A The fact that we were given a statement that the BCRs were, as is normal, the Board's mandated requirements, and my understanding is that the Environmental Matrix was noted as part of the BCRs.

Q Bear with me a second.

Now, if we could go, please, to Bundle 2, page 873. Bundle 2. You may recognise this, Mr McKechnie, as an extract from the Board's Construction Requirements. You see down at the bottom of the page the heading, "Mechanical & Electrical Engineering Requirements," and the opening line there: "Project Co shall provide the works to comply with the Environmental Matrix." Is that the provision that you were referring to a moment ago?

A It is one of them, yes.

Q I mean, I appreciate there are lots of documents, but were there others in particular that you had in mind?

A There is. I'm trying to remember. I can't remember the name of the document because, as you say, there's hundreds of them, but in the response that IHSL had to give as part of their-- let's call it their tender proposals, I can recall a particular line there which stated that the-- something along the lines of any alterations to the Environmental Matrix had to be highlighted.

Q Okay.

A So all of that reinforced, in our opinion, the mandatory aspect of that. I think you've also got to question yourself that if it wasn't mandatory and

didn't reflect the Board's requirements, I can't actually see the point of having it.

Q Just expand on that point if you would.

A Well, if the Environmental Matrix was not to define the Board's requirements, then we were going into a contract without what I would consider to be a major portion of a client's brief.

Q And if you were going into the contract without that, would you regard that as something that have to be put together?

A Absolutely. I mean, what you're speaking about there is that that Environmental Matrix is defining the level of servicing which we are designing to and which you're undertaking to provide. If you don't have that, you leave the whole design. From a commercial point of view, it sounds like suicide, to be honest, because your financial side of it is totally out of control at that point.

Q What degree of work would be involved in putting together an Environmental Matrix if you were doing it from scratch?

A From scratch it's a nightmare, because we've done it in a number of the different hospitals. There isn't the-- there's a facility which

was used in Edinburgh, which I thought was a sensible facility, whereby you can capture typical repetitive style of rooms to help you populate. So, if you've went to the bother of doing those 20 columns of information for a particular room, and you know that you've got another 200 of those rooms, you can basically copy and paste that, simplistic terms, so that you reduce the risk of a compilation error, but it's a long process. So that's----

Q Okay. My Lord, I am about to-- well, the next part of my questioning would be to take Mr McKechnie to various document references, and I note the time is eleven o'clock. That may be a convenient point to stop if it suits your Lordship.

THE CHAIR: Yes. We will do just that. Mr McKechnie, we will take a break of about 20 minutes for coffee.

A Excellent. I was just about to put my hand up anyway.

THE CHAIR: Obviously, you and Mr McClelland have dealt with a certain developed a certain affinity, so I will ask for you to be taken to the witness room.

USHER: Please stand.

(Short break)

THE CHAIR: Again, Mr McKechnie, if you ever want to take a break, just let us know. Mr McClelland?

MR MCCLELLAND: Thank you, my Lord. Now, Mr McKechnie, just before the break, we had talked about your view that the Environmental Matrix contained the Board's mandated requirements.

A Yes.

Q Were you aware that the Board also wanted the ventilation system to comply with SHTMs?

A Yes.

Q In the event of a contradiction between the SHTMs and the Environmental Matrix, how did you understand that was to be reconciled?

A If there had been anything like that, I would have anticipated we would have highlighted that to Multiplex's design manager, who would then have taken it up with the Board. We also had-- I need to watch my timing here because I was going to follow into the RDD, but I'm probably shooting too far ahead there, aren't I?

Q Are you talking about the reviewable design process after financial close?

A Aye. Yes.

Q We will cover that.

A So, up to the point, then, we're speaking about, if we'd had-- had noted anything, our conduit for raising any query was via Multiplex.

Q Were you aware of the Board in the ITPD documents having described the Environmental Matrix as a "draft"?

A No, that doesn't resonate with me.

Q Were you aware of them as having raised the possibility that bidders might make changes to it?

A Again, that doesn't resonate. If I had picked it up as a draft, it would have been that I would have anticipated that there was some additional rooms, etc., to be added to it but that I wouldn't be touching any of the base information.

Q If we could go, please, to bundle 2, page 1022, please. Now, this is an excerpt from the ITPD documents issued by the Health Board, and this particular section, as you can see from the heading, sets out the submission requirements expected of bidders making bids. Do you recall if this is a document you saw at the time or would have considered?

A We would have seen the document because I had a whole host of the ITPD documents delivered to

me. We would have-- there were specific engineering elements in the responses – C1 to C31 that's referred to there – which we would have contributed to.

Q Okay. If we go to page 1052, please. So, we see here the reference "C8". See that? Is that within the submission requirements that you would have been considering?

A Yes, yes.

Q And C8, you see in the left-hand column, is headed up, "Clarity, robustness and quality of M&E engineering design proposals."

A Yes.

Q Then in the column headed up "Submission Requirement", it begins by saying that:

> "Bidders must submit proposals setting out their approach to M&E engineering services design. This must be provided as set out in C8.1 – C8.3 below."

So, did you understand that these were the requirements to be met by bid submissions in relation to M&E?

A Yes, and, on the basis of that, we compiled our draft C8 responses.

Q Okay, and if we go down to page 1054, please, so we are still

here within C8, and the paragraph that begins in the middle of that column reads that:

> "The following information should also be provided to help demonstrate the design proposals noted above, including:
>
> x. An environmental conditions / room provisions matrix for both mechanical and electrical services for each room in the Facilities…"

And then miss out the next paragraph and read from the bottom:

> "Whilst Bidders are required to undertake their own design, the Board has provided a [if we go over the page, please, page 1055] draft Environmental Matrix as part of the ITPD documentation. Bidders must confirm acceptance of the Board's Environmental Matrix, highlighting any proposed changes on an exception basis."

Were you aware of these provisions at the time of----

A Yes, I was. That was the paragraph I couldn't remember the number of that I referred to earlier on.

Q What, if anything, did you take from the fact that the Environmental Matrix was described there as a "draft"?

A I would have assumed that the draft part of it was that possibly it wasn't entirely complete or match the schedule of accommodation which was still being developed at that particular time, but – and I would stress this – I would not have ever expected that any of the given performance criteria would have been expected to change.

Q And just explain why you would not have expected that?

A Simply because, at that particular point in time where we were going into what was a legal agreement, in any contract of my experience you have to have your performance criteria that you're going to provide the systems to nailed down.

Q But if they had not been nailed down, is the process of nailing them down something that you as a mechanical and electrical designer could have done?

A I couldn't have done it without referencing it back to the client, and at that point, if it hadn't been nailed down to the point of this document, again, you're looking at someone trying to price an installation which potentially could fluctuate, and also someone-- I don't have enough information there to do my own detailed design.

Q Did you understand from the text that we just read a moment ago that there was scope for bidders to suggest changes to the Environmental Matrix?

A I accept that, yes, there was scope, but my understanding through the process was that the given figures on the Environmental Matrix and the rest of it were essentially mandated and that there was not an encouragement for re-engineering, if I could put it that way.

Q In what circumstances did you envisage at the time that the bidders might make changes to the Environmental Matrix?

A I didn't see any particular benefit on making any changes to the Environmental Matrix at that point in time.

Q Were you aware of the Board having said in the tender documents they issued that Building Services Solutions were supplied with the tender documents but for information only?

A I understand that the information which we received wasn't particularly detailed in the reference design. Therefore, I could understand from that that there was a development of the designs required. I mean, the layouts of the, for example--

Well, we'll stick with ventilation. So the layouts of the ventilation hadn't been developed up in any manner, so all of that work was still to be done.

Q If we could go, please, in that bundle to page 965. You see down at the bottom of that page, there is a heading "Indicative Elements of the reference design"?

A Yeah.

Q This is taken from volume 1 of the ITPD documents issued by the Board. Do you recall seeing that at the time?

A Yes, yes.

Q And just reading from paragraph 2.6, it says that:

> "During the preparation of the Mandatory reference design Requirements, other information has been generated both as a by-product of preparing the reference design itself and as a general Project requirement as follows:"

Then, over the page, we have got various things listed there, but they include at paragraph (iii):

> "Building services engineering solutions… This constitutes the **'Indicative Elements of the reference design'**. Such information is issued to the Bidders for

> ‘information only’ so that they may understand the intent of the reference design. Bidders must however refer to the Board’s Construction Requirements for the detailed requirements for all such Indicative Elements of the reference design for which they will ultimately carry the risk. Bidders are advised that the Board’s Construction Requirements will always take precedence over the reference design for matters which do not define Operational Functionality.”

Then there is a reference to Appendix E for the full distinction between the mandatory and the indicative elements. Did you understand the reference there to Building Services engineering solutions as including the Environmental Matrix or not?

A No, my understanding would be that the Environmental Matrix, as such, sat outside of what we’re speaking about there. My interpretation of the Building Services engineering solutions-- the solutions are a different animal to the end result, which is what the Environmental Matrix is intending to capture. The actual detail within the reference design on the services solutions was textual in format where it gave strategies, but there was little in the way of layout details or detail on how a particular piece of ducting, for example, got from point A to point B. So I would normally have expected to see some indicative layout drawings. That wasn’t the case in the reference design, hence why my interpretation of that and the acceptance of that was that work was something I had to do.

Q So, if I can try and play that back to you to make sure I have understood it, you were seeing the Environmental Matrix as not forming part of Building Services engineering solutions which are said here merely to be an indicative part of the reference design?

A Absolutely not. The Environmental Matrix was, as far as I was and I’m concerned, the client’s brief on what he wanted that building to achieve.

Q Were you aware of the Board having disclaimed responsibility for the accuracy or adequacy of the information that it supplied in the tender documents?

A Yeah, that’s the kind of cop-out phrase I would use in any of my own documents, so yes, I’m quite familiar with that terminology, but it doesn’t-- to be frank, it doesn’t really impact on me because I take

responsibility for my designs that I take forward. So I'm not accepting someone else's design and, in this context, they're speaking about the reference design.

Q Now, if we go to the paragraph in question, page 1012 in that bundle, it is paragraph 6.3 there, headed up "Information provided to Bidders – Warnings / Disclaimers":

> "While the Information Provided has been prepared in good faith, it does not purport to be comprehensive nor to have been verified by the Board or any of their advisers. Neither the Board nor any of their agents or advisers accept any liability or responsibility for the accuracy, adequacy or completeness of any opinions, commentary, information and documentation contained in the ITPD…"

And so on:

> "No representation or warranty, express or implied, is or will be given by the Board or any of their agents or advisers with respect to such opinions, commentary, information and documentation…
>
> "It is not warranted that the Information Provided shall identify or provide Bidders with Solutions for the attainment of the Board's requirements."

Would you have understood that disclaimer to have applied to the Environmental Matrix?

A Only as much-- in fact, no, I wouldn't have. As I've said, it's a brief; with respect, that paragraph there is probably made up by guys like yourselves in the room to cover themselves, and it's standard practice. I don't have an issue with it.

Q I think what you said a moment ago was that, in a way, you regarded that as irrelevant because you would be taking responsibility for your own designs in any event?

A Yeah, absolutely, yes. It's irrelevant, if you like, to the actual nuts and bolts design, but the matrix sits apart from that. The matrix is a brief.

Q Were you aware of the Board having set a requirement in relatively general terms for the Project Company to maintain leadership through the design stage?

A "To maintain…", sorry?

Q To maintain leadership through the design stage.

A Yeah, yeah.

Q Just the particular reference is on page 791. We see here, headed up "Project Wide

Requirements," the opening words, "The Board's vision is to provide high-quality, patient-centred services from modern Facilities," and then down three paragraphs it says:

> "The Board requires the following matters to be addressed as part of its requirements:
>
> a) The need for Project Co to maintain leadership throughout to the agreed final design stage."

Then reading on a bit further down:

> "Project Co shall ensure that the design of the Facilities draws upon and endeavours to further develop, improve and exceed current best practice (and Good Industry Practice) standards achieved in other similar schemes, and meets the requirements of the prospective patient groups, staff and the public."
>
> What, if anything, did you take that to mean in the context of your own work?

A In the engineering context, that simply reaffirms to me that we were working as part of the IHSL team, but there's no-- I can't think of any other particular impact on what we were doing as engineers.

Q What about that provision which talks about exceeding current best practice standard?

A Again, from an engineering point of view, I would-- we are slightly constrained, if you like, to provide engineering solutions which are in accordance with the guidance that's existing at that particular point in time.

Q For example, if you take those requirements to show leadership through the design stage and the desire to exceed current best practice standards, did you consider whether that might be a prompt or an encouragement to bring to the Board's attention changes to any of the parameters, for example, in the Environmental Matrix?

A Only if we had seen something which we thought was an enhancement to what was being put there but, as I say, as health engineers we are constrained to work within the guidelines that we have. Commercial development is entirely different. I can come up with some hare-brained ideas there, which might save somebody a lot of money or whatever, but not in a health project.

Q To what extent did you consider it part of Wallace Whittle's responsibility in the period prior to financial close to go through the

parameters in the Environmental Matrix and check them for compliance with SHTMs?

A I would say we went through all of the guidance in the Environmental Matrix in the process of developing the actual engineering solutions. Again, that was post-FC.

Q That was post-financial close?

A Yes.

Q Was there any process of that nature gone through prior to financial close?

A None other than we had studied the information that was given to us, and we understood the strategies, for example, on the opening windows and the 4 air changes within the bedrooms.

Q Bear with me for just a moment, please, Mr McKechnie. Yes, if we could look briefly at Wallace Whittle's appointment from Multiplex, which is in bundle 10, volume 2. Just so we can orientate ourselves, if we can go, first of all, to page 4091? So we see here "BROOKFIELD MULTIPLEX CONSTRUCTION and TÜV SÜD (trading as WALLACE WHITTLE) APPOINTMENT OF MECHANICAL AND ELECTRICAL ENGINEER." Was this a document you were familiar with during the

project?

A I reviewed that along with my legal people who-- at that time, it would have been my insurers to ensure that I wasn't signing off on something which was going to end up coming back and biting me.

Q If we go to page 4122, we can see the signing block, much of which is redacted, but I think you can just see that it was signed on 13 February 2015, so on or around financial close.

A Yes.

Q And if we go, please, to page 4100, clause 2.1 there, and it is really just the last couple of lines, see that:

> "The terms of this Agreement shall retrospectively govern any work or services carried out by the Consultant prior to the date of this Agreement."

Was it your understanding that this contract would have applied to the work done by Wallace Whittle through the procurement phase, as well as after the procurement?

A Yeah, I was quite comfortable with that given that we didn't have a-- as Multiplex didn't have a formal contract up to that point in time. They were reliant on what we

had done to help them get to that point in the contract as being robust. So that seems perfectly logical to myself.

Q If we can just take a look at the contract services. So, again, to orientate ourselves, if we just go to page 4129, so we see here this is the schedule to the contract setting out the scope of Wallace Whittle's services, and then if we go to page 4132 and at paragraph 1.10 we see there:

> "In respect of all Work Stages, the Consultant shall…
>
> (d) Inform itself of the Project requirements by regularly consulting with other relevant parties and the Employer. Review all relevant documents and immediately inform the Employer of any apparent errors or ambiguities contained in such documents and make recommendations for the correction of such ambiguities."

So, were you aware that that was part of the function that Wallace Whittle had undertaken in the project?

A Yes, and it's not an unexpected requirement. As I say, if we had seen something we weren't comfortable with, we would have flagged it up and, again, I'm biting my tongue because I don't want to talk about post-FC.

Q Okay. Would you agree that the scope of your engagement required a check on whether the Environmental Matrix was compatible with SHTMs?

A In general terms, yes. 50,000 individual boxes, did I check them all individually? I've got to be honest with you and say no, we didn't. We checked what were seen as the key parameters.

Q Okay, but if there were ambiguities in or between the Environmental Matrix and the SHTMs, would you agree that it was one of Wallace Whittle's responsibilities to detect that and bring it to the attention of the Board?

A Yeah, if we'd seen anything, that's exactly what we would have done.

Q How much work would have been involved in checking all of the parameters in the Environmental Matrix for compliance with the guidance?

A I would suggest, given the size of the document, it would have taken months because that would presumably have been-- Because we didn't do-- I don't think it was incumbent upon us to do it to that level, but if we checked every single box in that, that would have taken

months of work.

Q Would it have required engagement with the Board and its clinicians?

A I think it most probably would. To be frank, it would almost be the circumstance where you were reinventing the Environmental Matrix from the get-go.

Q After the ITPD documents were issued, there was a period of competitive dialogue involving the bidders and the Board. Were you involved in that?

A I was, yes.

Q Insofar as there was any ambiguity or room for doubt about the Board's requirements – and I appreciate you are saying that you did not think there was or there had not been one detected – would that have been an opportunity to discuss and resolve it?

A That could have been, yes.

Q Insofar as those competitive dialogue meetings related to ventilation, who attended them?

A The majority of the ones referring to ventilation, it would have been myself and possibly another member or members of my own staff. If I remember correctly, at that point in time, it would have been the client's technical team, which was their technical-- the Mott MacDonald guys.

Q Can you remember who it would have been from Mott MacDonald?

A The one that stands out would have been Colin Macrae, who was the mechanical ventilation. There was some other people who came in, but they were not-- I wouldn't say that they were-- I can't recall them being constant. So Colin Macrae would've been the one that would have sprung to my own mind.

Q Was there any representation from the Board?

A There was representation. Brian Currie was at some of these meetings, but not all of them.

Q Just give us a kind of overall flavour of what would happen in these meetings.

A I think, from memory, there was a subject picked which we would then go and discuss the IHSL's proposal for and take on board any comments, if you like, from the NHSL team or information that they required or clarification that they required. It would have been a lot easier if we had minutes of them, but I understand that they don't exist. So, again, I'm going back in my old memory bank, so I can't

speak clearly on particular subjects that were addressed on a kind of meeting-by-meeting basis.

Q We are obviously focusing on ventilation, but were you involved in these meetings insofar as they related to the full category of mechanical and electrical matters?

A On any mechanical matters, I would tend to be there. I was the lead director on the project. The electrical, which I have no expertise in whatsoever, I would have left to be led by one of my fellow electrical-skilled directors.

Q There is a danger, perhaps, when you focus in on one issue in particular, that you assume that the meetings are all concerned with that. Can you give us a sort of percentage estimate for what proportion of these meetings were concerned with ventilation as opposed to the wider mechanical matters that you were dealing with?

A Again, I'd be scoring-- you know, just off the top of my head, we'd be talking 20/25 per cent.

Q So far as you recall, was the Environmental Matrix discussed at any of these meetings?

A There was discussion about the Environmental Matrix between ourselves and Multiplex and,

at that point in time, there was debate on the ownership of it and whether I would take it on board.

Q This was during the competitive dialogue stage?

A It would have been, yeah.

Q What was the substance of that debate?

A I was putting forward the position that I was uncomfortable with taking on board a client's brief as my own documentation.

Q The reasons may be obvious, but could you just say why you were uncomfortable with that?

A Because under normal circumstances a client's briefing is exactly that. It is what the client is wishing, how his building is to perform. I didn't see that that was a relevant document for me to take ownership of.

Q When you use that phrase "take ownership," what do you mean by that?

A Well, what was put forward was that they wished IHSL to produce an Environmental Matrix.

Q You understood that you were expected to take on the one produced by the Board?

A That was what was being put forward and, basically, I was told it was a game changer if I didn't take it.

So I reluctantly took the document on board but asked for it to be formatted in such a way that I could take this huge document on board and then re-badge it as a IHSL or, if you like, a Wallace Whittle document.

Q You said there that it was put to you that it would be a "game changer" if you did not take it on. Who said that to you?

A That was the advice I was getting from Multiplex from their discussions with-- either their discussions or IHSL's discussions with the Board.

Q So, whose view did you understand it to be that was communicated to you that this would be a game changer if you did not take it on? Was that Multiplex's view or was that the Board's view?

A I believe it must have been the Board's view that was getting translated down the food chain to myself.

Q Now, you say that this was something that made you feel uncomfortable. Why was it you felt uncomfortable about it?

A I felt uncomfortable due to the fact that it's outwith my normal experience of taking on board someone's developed design brief and badging it essentially as my own. I felt

it should have remained as a Board requirement. I was perfectly comfortable with that.

Q Were you uncomfortable because there was an intention to turn something which had initially seemed to you as the Board's brief and to convert it, effectively, into a contractor's proposal?

A Yes.

Q Is that because if it becomes a contractor's proposal, you take on responsibility for all of the contents of it?

A That was my take on it, that if there had been a compilation error-- and I'm not speaking about a numerical error. I'm speaking about if it turned out that the Environmental Matrix contained an error in compiling the Board's wishes and they subsequently came back and said they didn't want a particular solution, then that sits at odds with me from being a designer. I'm happy enough to take it as an employer's brief and give them the building to the standard that they've requested.

Q You said this matter was discussed between you and Multiplex during the competitive dialogue phase. Was the matter resolved between you, or was it elevated into a discussion with the Board?

A After the gun was removed from my head, I accepted that I would take it on board because we're speaking about some commercial decisions that have to be taken here which had to be viewed as well.

Q So, do you mean by that that you did not reach the stage of having to raise it with the Board, you just accepted that Wallace Whittle would take on the Environmental Matrix----

A I didn't have that direct route of communication with the Board. I was responding to requests from Multiplex to take the Environmental Matrix.

Q At that point, given your discomfort about taking it on, did you take any steps at that point to check the parameters that were set out in the Environmental Matrix?

A The 50,000 plus boxes? No, I couldn't do that.

Q No.

A As I say, that was impossible to do.

Q If we go, please, to bundle 6, page 1026. We see here from the text at the bottom that these are papers associated with "DIALOGUE MEETING 3, 29 May 2013." If we go to page 1029, please,

the heading is "C8.3," so that is one part of the structure of the tender requirements, headed "Environmental Matrix," and it reads here:

> "No changes proposed at this time nor envisaged in the future but we will continue to review and advise back (as previous)."

Now, does that reflect your position at that time on the Environmental Matrix?

A Yes, it does.

Q How were you able to reach the view that no changes were currently to be proposed?

A As at that time, we hadn't come across anything which had jumped out at us as requiring clarification.

Q You say that you would "continue to review and advise back." What sort of review were you anticipating?

A The review was to allow a conduit whereby, once we had started to detail the actual detailed design, if something had come up there which we felt wasn't sitting square with the Environmental Matrix, then we would have pushed that back up the line, which we did, but not at this particular time.

Q Okay. So, is this just a

reflection----

A I left the door open.

Q This is a reflection of the fact that there was a process of design development to be gone through, which might throw up queries or questions about details----

A Absolutely.

Q -- whether in the Environmental Matrix or otherwise?

A Yes.

Q Okay. If we could look now at IHSL's tender. Were you familiar with IHSL's tender insofar as it pertained to ventilation?

A Depending on what document you're speaking about. I don't recall seeing the full tender, but we were party to providing information for the engineering elements, which were then transferred into various sections of IHSL's tender.

Q Okay. If you could go, please, to page 3 of that bundle, which is bundle 6. We see from the text at the bottom here, that this is a document entitled, "Specification for Ventilation Systems."

A Yes.

Q We see below that what looks like a Wallace Whittle reference and probably also your initials.

A Yes.

Q Is that right?

A Yeah.

Q Is this one of the documents that you prepared?

A Yes.

Q As I say, it is headed up, "Specification of Ventilation Systems." What was the purpose of this document?

A That particular document, I think, was to highlight the installation standards, if you like; a measure of the quality of the ventilation installations that were going to be installed.

Q If we scroll on down through it to page 8, please. Actually, if we go back a page to page 7, please. We have got a section here which is headed up, "Purpose of Document," and various things are said there. If you just take a moment to read that introduction, Mr McKechnie, and perhaps that will remind you about the purpose of the document.

A Yeah. This document appears to be specification which would have been part of the package that would have been passed to the subcontractors that were involved in the document, as such. There are portions from-- I believe it's NBS specification, but it's basically-- it's almost a workmanship and material

quality specification.

Q Okay, and you mentioned the subcontractor. So, who did that turn out to be in the end of the day?

A The M&E subcontractor working for Multiplex was a company called Mercury Engineering.

Q So, this would have been intended as-- well, to demonstrate to the Board what you were going to be saying to the M&E subcontractor?

A Yeah, a bit more than that. It was intended to reinforce that the quality, the actual build quality, of the installation and the components of it were to a certain level and standard, which would tie, if you like, IHSL down to providing that standard of installation.

Q If we go to page 8, please, there is a section headed up there, number 5, "APPLICABLE STANDARDS." It says:

> "All elements of the work shall be in accordance with the requirements of current legislation, regulations and industry standards unless otherwise stated.
>
> The Ventilation System shall accord with all appropriate Health Technical Memoranda, Codes of Practice…"

And so on. Then down at the bottom of the page, under the heading of "DESIGN CRITERIA":

> "For ventilation/air change rates used in the design, the Sub-contractor shall refer to the ADB sheets."

Now, were the ADB sheets in existence at the time this document was put together?

A No. As I say, that appears to me to be an extract from the standard NBS specification, which was to tie down the quality of the installation, and I am assuming that that's where the ADB sheet reference comes from.

Q Just explain for the record what the standard NBS specification-- what that is a reference to.

A The NBS specification is an industry standard whereby you can go for any particular style of installation, be it ventilation, heating, chilled water, boilers, or whatever. It ensures that the contractor is tied to a particular quality.

Q Okay. So----

THE CHAIR: Sorry, my fault entirely. I did not get the acronym.

A NBS.

Q D?

A B.

Q B. Thank you. Maybe when I am asking, that is an abbreviation of what, Mr McKechnie?

A Well, it starts with National----

Q Building----

A Building Standards.

Q Thank you.

A I think.

MR MCCLELLAND: So, there are various references throughout this document, but I do not think we need to go through them all, which are to the effect that the system would comply with SHTM 03-01, but there do not-- and I did check, and I think this is right. There do not appear to be any references in this document to the Environmental Matrix. So, if you saw the Environmental Matrix as a mandatory set of requirements, would we not expect to see that referred to as the source of standards rather than SHTM 03-01?

A No, not really because I believe the Environmental Matrix is part of the package of these documents, but the matrix and the design standards are basically my area of responsibility. This document that we're looking at, the specification of the build quality, is more the subcontractor. So, the subcontractor will provide an installation which is

capable of satisfying the design requirements, which I have taken on board within our design which has been passed to them. It's not normal to pass those requirements over to a subcontractor.

Q If we move forward, please, to page 252 in that bundle, we see from the text at the bottom that this is the IHSL response to section C8, which is part of the mechanical and electrical engineering element of the tender. If we go forward, please, to page 254, we see there that that is the headings from the Board's tender documents. It says, "C8 CLARITY, ROBUSTNESS AND QUALITY OF M&E ENGINEERING DESIGN PROPOSALS." At C8.3, we see the reference to "ENVIRONMENTAL MATRIX." If we go forward, please, to page 262, we see there what the Board was requiring in this part of the tender, and that was for bidders to:

> "… submit proposals setting out the engineering services design for each element of the scheme in sufficient detail to demonstrate compliance with the Board's Construction Requirements."

If we go forward to page 263, it says in the second paragraph, "As discussed during dialogue we have

generally followed the reference design…" What discussions does that refer to?

A The dialogue meetings?

Q Yes, and specifically the ones where----

A The competitive dialogue meetings?

Q Yes, and in particular the reference there to generally following the reference design.

A That statement was intended to convey that the solutions which we were anticipating on carrying out detailed designs on would be in accord with the general guidance of the reference design solutions, bearing in mind that the reference design did not have, as far as I can best recall, layouts of the runs of the services. However, it had indicated plant areas and locations which we had looked at. It had some-- if you stick to the ventilation, it had schematics of the overall solutions which we weren't particularly at odds at, but very early days, development drawings that were included within the reference design.

Q The use of the word "generally" there, does that simply reflect your recognition that you were not compelled to follow every element of the reference design?

A Not at all, no. It was

simply more a statement on the extent of detail which was within the reference design package. There was still an awful lot of work requiring to be done.

Q If we go forward to page 264, this is in that first section of text, we see the first bullet point reads, "These outline designs have been reviewed for compliance with SHTMs etc…" Was that a review that you had carried out, or Wallace Whittle had carried out?

A Wallace Whittle would have carried it out as we were looking at the concepts, etc.

Q Would that have included the Environmental Matrix?

A Not in a detailed review of the Environmental Matrix, no. As I say, that followed much later on.

Q So, when the statement was made there that there had been a review for compliance with SHTMs, that was not intended by you to mean that the Environmental Matrix had been reviewed for compliance with SHTMs?

A We had reviewed the key parameters with the SHTMs, for example, the 4 air change rates that were called out for in the single wards.

Q Okay. We will come back to that. Then, if we could go to page 295,

please. Again, this is setting out the Board's requirements of the tender process, "Bidders must submit proposals setting out how their design will be developed to include the following…" And down at second bottom, "…Environmental Conditions Room Matrix." Then, within that section, if we go to page 303 please. This is IHSL's response to the point we just looked at, which is, heading "Environmental Conditions Room Matrix":

> "The mechanical and electrical services shall be provided in accordance with the reference design environmental matrix and we shall provide an addendum matrix for any rooms on an exception basis highlighting any changes at preferred bid stage."

Now, that might be taken to indicate an intention on the part of IHSL to review the matrix and perhaps change it during the preferred bidder stage. Is that fair?

A I think you might be reading more into that than what it actually says, from my opinion. I think it's leaving the door open that, if there is a required addendum, then we have already put down a line in the sand that says this is what we'll do.

Q Okay. So, it was at least regarded as a possibility at that stage that there would be changes proposed to the Environmental Matrix?

A Yes, because at that stage there was still architectural development going on with the building which, as it turned out, meant that there was additional rooms which weren't covered by the initial Environmental Matrix, as produced by Hulley & Kirkwood, which had to be added to the matrix, so.

Q If we go on to page 304, please, just looking at the left-hand side of the page, there's a heading, "Environmental Conditions." Text below it:

> "We have followed the reference design and have utilised the reference design matrix to compile the room environmental proposal drawings listed below."

That is a reference there to the Environmental Matrix, is it? The words used there are "reference design matrix."

A Yeah.

Q Then, just below that list of drawings, "The room temperature set points, air change rates," and then something goes wrong with the text, "shall be in accordance with SHTM-

03," and so on. Then there is a table below which lists various rooms, which include bedrooms, showing supply ventilation, air change rates of 4 air changes per hour, but also on that list there is HDU showing a ventilation supply of 10 air changes per hour. Do you see that?

A Yes.

Q So, is that perhaps an indication at the time that it was IHSL's intention to follow those particular parameters from SHTM 03-01?

A Yeah, but the reference to HDU, in my mind, covers the High Dependency areas, which are within the Critical Care, and that those areas would have been the isolation room areas, which we have given the 10 air changes and 10 pascals to. So, that's not a definitive list by any manner of means.

Q Okay, and when you read HDU to refer to the isolation rooms within the Critical Care department, was that the judgment that you yourself formed, or was it one that came from input from a clinician, for example?

A It wasn't from a clinician, and it was a reflection on the rooms which were specifically highlighted as being isolation rooms within the Critical Care. The terminology for the Critical Care area is "PICU and HDU's." Therefore, I take that as guidance that I need to look at the rooms to see where these High Dependency Units are.

Q Okay, so for you, as an engineer, you would obviously have to be looking at the more detailed documents on that. So, are we talking there about the Environmental Matrix, and perhaps the Clinical Output Specification that we looked at before the break?

A To the best of my knowledge, there was no rooms designated as HDU within the Environmental Matrix. There's a line to the left-hand side of the matrix which states the area of the hospital it's looking at, which are PICU and HDU's – apostrophe, "S" – and then further in it lists each and every individual room. There's not a room called the HDU to the best of my knowledge, but there's certainly rooms called isolation rooms.

Q Okay, so if we could just have that document back up on screen, please, which was that table. So, why is there a reference in this table to HDU?

A I think we were playing back the terminology that was getting used in the matrix, and----

Q When you say "playing back," do you mean that you understood, in putting together----

A There was a reference in the Environmental Matrix to HDU and it called for 10 air changes and 10 pascals.

Q Okay.

A When we took ownership of the Environmental Matrix, we clarified that because we felt it was incorrect the way it was labelled. We clarified that 10 air changes and 10 pascals pressure would refer to the isolation rooms.

Q Okay, so we will come back to the matrix and the changes that you made to it, but at this earlier point when this tender document is being put together, your understanding at that point, at least I think what you said a moment ago, was that you were reflecting back what the Board was looking for. Your understanding at that point was that the Board wanted 10 air changes per hour in a room designated as HDU.

A Yes.

Q If we go over to page 305, just for completeness, we see there at the bottom IHSL's response to the Board's request, which is in blue.

A Yeah.

Q This is the same wording

that we saw in the papers for the competitive dialogue meeting.

A Yes.

Q That "no changes were proposed at this time nor envisioned in the future," but you would "continue to review and advise back."

If we could go forward, please, to page 323. Sorry, 323. This is a document we can see headed up, "Building Services Deliverables." Then this is the appendix dealing with mechanical and electrical services. Was this a document you were involved in producing?

A Yes, it would have been.

Q What was the purpose of this document?

A I could tell you better when we go to the next page, but it looks like it's a strategy style document.

Q Okay, if we could go to page 324, please. Again, if you just perhaps scroll through the first few pages in case that helps Mr McKechnie remember the document.

A Yeah. Again, this is a collation of all of the information which we were providing to support IHSL's proposals. That particular page there is all our drawing list.

Q If we could just go forward to page 350, please, and the

section there headed up “Mechanical Ventilation System,” and it is just that first sentence there, “The ventilation systems to the Hospital are designed in accordance with Scottish Health Technical Memorandum SHTM 03-01.” Again, how did you see that relating at the time to what was said in the Environmental Matrix?

A I didn’t see any conflict between the two of them.

THE CHAIR: Sorry, Mr McKechnie, I just missed that. You did not see----

A At that point in time, we didn’t see any conflict between the two of them.

THE CHAIR: Thank you.

Q So, IHSL were, in due course, were appointed as the preferred bidder in March 2014, and the Project Agreement was signed in February 2015. So, I want to move on to ask you about that period from IHSL’s appointment as preferred bidder up until financial close.

A Okay.

Q From your perspective, what was the objective of the preferred bidder period?

A My understanding would be that that was to allow, if you like, a degree of fine-tuning between IHSL’s proposals and the Board’s

requirements.

Q Okay, so that they met one another?

A Mm-hmm.

Q Again, was this period therefore an opportunity, insofar as ambiguities had been identified in the documents, to discuss and resolve them?

A It would have been if we had seen any ambiguities, bearing in mind that the actual detailed design work would not be put into place until after we got total agreement on the contract.

Q So, what was your role through the preferred bidder period?

A Basically, I was still leading the team and helping to focus my people on providing any ancillary information that Multiplex asked of us.

Q When you say “leading the team,” you mean the Wallace Whittle team?

A Yes.

Q How did you interact with the Board? Was that directly or via Multiplex?

A It was always via-- sorry, that’s wrong. It was generally via Multiplex, with the exception of where we had dialogue meetings where there was the potential for one-to-one discussion. Any information issues

from either side would be channeled through Multiplex.

Q Then you said earlier that you recalled your Multiplex contact was Ken Hall.

A Yes.

Q So, would he have been your point of contact?

A It was definitely him at that point in time, yes.

Q Yes. If we just take a look at what happened to the Environmental Matrix over this period. If we could go, please, first of all, to bundle 10, volume 2 at page 1302. In fact, if we could go down, please, we have got a document which straddles two pages here. If you see at the bottom there, Mr McKechnie, there is an email from B Rutherford to Ken Hall.

A Yes.

Q Do you know who B Rutherford was?

A Yes, he was one of my one of my engineers working on the job.

Q So, he is a Wallace Whittle person?

A Yes, he is.

Q The subject heading is, "Humidification."

A Yeah.

Q If you just go over the page to 1303, please, and what he is saying is:

> "Ken,
>
> Our understanding is that the Theaters have been confirmed as not requiring humidification.
>
> We are seeking clarification as to whether the humidification is still required within the HDU and Critical Care Areas…"

So, is this a query about the ventilation system?

A This is a query about the standard of the air handling units, which is basically the box that contains the fan which pushes the air down through the various systems.

Q Okay, so part of the ventilation system.

A Yes.

Q Yes.

A Sorry, aye.

Q If we go back to page 1302, we see Ken Hall forwards the email on to Maureen Brown and Graeme Greer at Mott MacDonald saying, "Would it be possible to confirm these requirements for Wallace Whittle, please?" Then at the top we have got Graeme Greer to Colin Macrae, again of Wallace Whittle, saying, "Can you help with the"----

A Sorry, Colin Macrae is a Motts guy.

Q Sorry, what did I say?

A It's an internal email for Motts.

Q That is what I intended to say. If I said something different, I apologise. I meant Colin Macrae of Mott MacDonald. Did I say Wallace Whittle?

A Yes.

Q Yes, sorry. "Can you help with the RFI [the request for information] below?" and so on. Now, you are not party to these emails but, in this exchange, who, in your view, was going to determine whether or not humidification was needed?

A Well, that was my engineer looking at the guidance that had been given on the standard of the air handling unit equipment and clarifying that humidification is an additional piece of kit, let's call it for simplicity, and it's not normally required within air handling units, which is a larger piece of kit. However, there is normally a requirement for leaving a space should it be required to be retrofitted, and so, as an example, my guy's going through the information that we had to hand, spotting something that we thought, "Oh, need to get this clarified,"

and hence this email exchange.

Q So, as an example of the designer looking to the ultimate client to clarify----

A At all times we would have done that.

Q Yes. If we have a look, please, at the Environmental Matrix, which was the version from the start of the preferred bidder period, which is bundle 4, page 132. If we could just zoom in on it so we can read those notes, please, so we can see the whole of Note 15, please. Now, presumably you are familiar with this document, Mr McKechnie.

A Yeah.

Q Do we see there in Guidance Note 15 that it is divided into sections with the bold text, which include "HDU bed areas" and "Critical Care areas"? Do you see that there?

A I can see the HDU bed area, but I'm not seeing the Critical Care. What was the reference there?

Q If you just look down through-- you see there are paragraphs beginning with----

A Oh, sorry. Critical Care areas, yes.

Q Yes, so we have got parts of Guidance Note 15, which relate to HDU bed areas and Critical Care areas.

A Yeah.

Q Do you see in each of those areas-- the final paragraph before you get to the next section reads, “Central [Air Handling Unit] plant requires humidification to achieve…” and so on. You see that in both sections?

A Yeah.

Q Is that the same issue, if you like?

A That that email----

Q That that email related to.

A Yes.

Q It is, yes. As far as you know, would it have been what appears here in these guidance notes that was forming the basis of the query being raised by your colleague?

A It would have been, yes.

Q If we could go back to bundle 10, volume 2, page 1300, please, we see two emails there. The bottom one is from Ken Hall, 3 July 2014, copied to you, but sent to Maureen Brown and Graeme Greer at Mott McDonald, and what Mr Hall says is:

> “Stewart [which I take to be a reference to you] has asked if he could have the environmental matrix in excel rather than pdf version to allow to populate the schedule with any changes.”

Then the reply is to the effect that, “We will give you that.” Why were you going to make changes to the Environmental Matrix?

A I was anticipating that further down the line, as I say, there was-- as it turned out, I was right. There was additions to the schedule of accommodation, which wasn’t covered by the original Environmental Matrix and which required to be added as an additional band.

Q So, you expected there would be new rooms to be added in the matrix?

A Yes.

Q Was it related to the query that had just been raised by Mr Rutherford about humidification?

A No, no, I would have said those two were separate inasmuch as Brian Rutherford’s query was about the detail of the plant that we were going to provide.

Q I think you agreed with me that the guidance notes dealt with the issue of humidification – that was the basis of it.

A Yes it was, yeah.

Q So, did that not give rise to a need to change the text of the guidance notes?

A Yes, it should have. It

should have. Once we got the answer from Motts, then that would have, or should have, driven a change in that text under the clause that you're speaking about, but that's not relative to why I was asking for the document as per that email that we've got up in front of us at the moment.

A Okay. If we could have a look, please, at the witness statement of Graeme Greer of Mott MacDonald, which is in bundle 13, and it is page 157, please. I am just going to read a passage from paragraph 79 of Mr Greer's statement. What he says is:

> "The development of the environmental matrix in the PB to FC phase started with a discussion on transferring the ownership of the environmental matrix to IHSL. I recall being involved in a conversation to the effect that it was now IHSL's EM and was for IHSL to develop, following which on 3 July 2014, IHSL asked for an excel version of the environmental matrix in order that they could develop it in accordance with their own design."

Do you agree or disagree with what Mr Greer says?

A I would tend to disagree with the rationale as to why we requested it. The inference there was that we had an alternative design to the reference design, so I don't recognise the last words in that, "to develop in accordance with their own design." I certainly wished that-- because it was a huge document, which I was anticipating would have some revisions or additions to it during the course of its lifetime, and it seemed the most sensible way of transferring that information over.

Q When Mr Greer says that this marked the moment when ownership of the Environmental Matrix would transfer to IHSL, do you agree with that? That seems similar to what you described earlier.

A That terminology of ownership was aligned with my reasoning for not particularly wanting to take ownership of the matrix at that time.

Q I mean, if I was to put it to you that the Environmental Matrix, at least from this point on, became one of IHSL's proposals and IHSL were, from this point on, responsible for the correct selection of environmental parameters within it, would you agree with that or would you disagree with that?

A I would agree with it on a "by exception." If we had changed

anything on the Environmental Matrix then, yes, I would have bought into ownership of that, but not to the fundamental guidance – and, again, I'm sticking to the ventilation here – on the air change rates for the rooms which were already in existence.

Q Yes, so insofar as you made changes to the matrix, you saw that as something for which you were responsible, but insofar as you left untouched parameters which had been put there by the Board, is that something that you----

A Yes, because----

Q -- saw as outside your responsibility?

A My understanding was that the Board's requirements were mandatory so that the performance solutions, which were detailed in the matrix, to me then become mandatory and, secondly, I didn't really intend to change any of those particular figures.

Q So, you said a moment ago that you envisaged making changes to the matrix, for example, to add new rooms to bring it into line with the up-to-date schedule of accommodation.

A Yeah, which we did.

Q Which you did and, insofar as you did so, would you accept that it was Wallace Whittle's duty to ensure that, for those new entries, the given parameters reflected applicable guidance such as SHTMs?

A The new entries which I can recall us was putting in were highlighted as such and, particularly in the ventilation, they were referenced to the design criteria that we were proposing. Those entries, if you like, were then subject to the RDD process, so we didn't do them off our own back. They were subject to full scrutiny and agreement.

Q By "full scrutiny," you mean scrutiny within the scope of what the contract defined as the purpose of the reviewable design data?

A Well, basically, we were playing back via the RDD process-- which, again, we're jumping past the FCL(? 03:41:19), but through the RDD process, we were playing back to the client's representative and the client what our suggestions, solutions for the particular additional rooms which hadn't been covered were, and sought agreement and got agreement on the eventual design criteria there.

Q I do not want ever to put any words in your mouth, but if I just put back to you what I take from what you have said, are you therefore describing the Environmental Matrix as an unusual halfway house: half client

brief and half contractor's proposals? Well, not half and half, but part client brief and part contractor's brief.

A Out of necessity, because it had shifted, the compilation of it, over to ourselves, it had to be that, but something probably more akin to 98 per cent client brief and 2 per cent variant, but there was no other vehicle for capturing that.

Q Okay. Now, as I understand it, after this version had been issued to you in Excel format, Wallace Whittle then produced a version of the Environmental Matrix still within the preferred bidder period.

A That's correct. Very early on we received a number of comments from the client against the Environmental Matrix. The matrix then became part of the reviewable design and it was given a designation of a B, I think it was, which a B was, "Take on board the comments and we're good to go." So we went through those comments and addressed them and, where necessary, revised the then-current version of the matrix to reflect our take on those comments.

Q If we could go to bundle 4, page 218, please. Do you recognise this document?

A Yes, yes. Yeah, I do, and in the matrix that we took on board those comments, we reiterated all of those comments in the introduction section of the matrix along with an explanation of our response, if you like, on them, and that was then put back to the Board.

Q Okay, so we see the document is headed up, "Environmental Matrix Comments - 13 October 14" and below that, "Received week beginning 20 October 2014." So, that pinpoints us in terms of time. This is a few months into the preferred bidder period, and the left-hand column is headed up, "The Board has the following initial technical comments on the draft 1 of the Environmental Matrix."

A Yeah.

Q So, does that column contain the comments made by the Board?

A These are the Board's initial comments which, to be frank, surprised me because I viewed it as their own comments against their own briefing documents. So, we then went back to the matrix and addressed all of those comments, as IHSL's confirmed on the right-hand side.

Q Okay, so when that heading refers there to draft 1 of the Environmental Matrix, do you take that to be a reference to the first version of

the matrix that Wallace Whittle had issued?

A Yes.

Q To what extent did that version differ from the one you had received from the Board?

A If there was any variations, and I can't put my hand on my heart and say there was nothing, I didn't expect that there should have been any because that was the whole reason for getting the matrix in Excel, taking ownership of it and holding to the information that was there. I kind of think that my guys might have corrected some obvious issues, but they were nothing to do with the key design parameters. Bearing in mind, you know, as I say, there's 20 columns of information there, and they go over some lesser important items, I would say, which we might have tidied up a wee bit.

Q You referred earlier to, you know, an approximation of about 10,000 individual parameters.

A 50,000.

Q 50,000. Did those remain largely intact in the version that you were sending out?

A The version-- yes. Yes, they would have.

Q You said that you were surprised when the Board came back

with comments, essentially because you had understood those parameters to be Board----

A Taking a briefing document and taking that in good faith and, as I say, reluctantly taking ownership of that, and then these comments come back. Not all of them would be in that category, but certainly some of them seem to be in that category.

Q Did the fact the Board were making comments on it indicate to you that the Environmental Matrix was not, in fact, a finalised set of the Board's requirements?

A I took it, to be honest, that this was a bit of a tidying up exercise that they'd done because they'd let the thing sit on a shelf or whatever, and then either people had changed their mind or they'd spotted something.

Q If we look in overview of the comments, we see that some of them-- in fact, if we go over the page, please, to page 291, I am thinking really about comments 7 and 8 here. We see that some of these raise concerns about compliance with SHTM 03-01. Do you see that?

A Yes.

Q Yes, and did you take that as an indication that the Board

was concerned the Environmental Matrix might not be compliant with SHTM 03-01?

A I didn't really interrogate it in that way. We more took each of the comments on face value and gave details of either our take on it or what the impact of the implementation would be. So we weren't-- we didn't have a field to say, "Well, this Environmental Matrix is not reflecting the Board's requirements." These appeared to be, as I say, possibly second thoughts on what they'd given us.

Q In terms of timing, this comes after IHSL had put in a tender saying, "We are going to comply with SHTM 03-01." Then the first set of comments back from the Board are to the effect, "Hang on a minute, this does not comply with SHTM 03-01." Did that give you pause for thought?

A No, because the recovery-- item 8 is a single room that they're speaking about, and in the overall scheme of things, taking that on board from a commercial viewpoint, because we hadn't actually carried out the detailed design at that point in time, was pretty small beer. The 4 air changes from the SHTM resulted in a much larger review of the bedroom ventilation. Again, and we've

expressed this in our reports, etc., we didn't see that the 4 air change, which was to our mind a mandatory condition, was necessarily at odds with the guidance of the SHTM, which has a section in it which refers you to the potential for viewing ventilation rates in accordance with the occupation rates.

Q We will come back and look at comment 7 in a bit more detail, but just as a generality, so I am clear about it, the fact the Board in its comments had raised concerns about the non-compliance of the matrix with SHTM 03-01, that didn't cause within Wallace Whittle a reflection on whether there might be other respects in which the matrix did not comply with the guidance?

A It didn't cause me to instruct a full audit of the 50,000 plus boxes, no.

Because again, as I say, we were looking at the key parameters which affect the design, not the minutiae.

Q It did not cause you to instruct that, but did it cause you to reflect on whether----

A I found it to be very strange, but that was part and parcel of the process.

Q Did you wonder to yourself whether, you know, perhaps there might be parameters, other

parameters in here which do not comply with guidance?

A It didn't cause me to. At the time I probably suspected that, but until I got down to doing the actual detailed design, there was no way I was going to be able to thrash that out anyway. I don't know how this list came about, but someone had obviously either had second thoughts themselves or they had noticed things in the matrix which they were then trying to potentially push onto IHSL.

Q So, I mean, all these various parameters are not, of course, your own work. So, were you privately aware of the risk that, you know, whoever did do the work might have got it wrong from point to point?

A I probably had my own opinion on the robustness of the briefing information that we'd been provided with.

Q Did you raise it with anybody at the time or was it something you kept to yourself?

A We probably discussed it in house, but at that point in time we were more focused on getting the job up and – sorry, I keep hitting that – up and operational, so that we could move to the next stage of the detailed design. To be frank, the more people tidied up – let's call it – the

Environmental Matrix was better for me because it meant I shouldn't have had to keep constantly, as I found something, going back and forth. So, as an exercise, it didn't particularly concern me.

Q We see from this sheet that at this point in time, October 2014, NHSL had raised 12 queries about the matrix. What, if anything, did you take from the fact that it had raised these particular queries and no others?

A I didn't really stop to think about it, to be frank.

Q Did you infer anything about what that might indicate about the Board's attitude to the parts of the matrix on which they had not commented?

A Not at all, no. I suppose in a way I was relieved that they only had 12 comments on it. I had expected that, once we'd dealt with them, that matrix would then have been accepted across the board, and I would then have a detailed brief to carry out my calculations and detailed design on.

Q Were you aware of the extent to which the matrix at this point in time was being reviewed by or on behalf of the Board?

A No. I wasn't, no. You mean internally within the Board?

Q Well, I mean who did you understand to have come up with the comments made on behalf of the Board that are recorded?

A I'd assumed it was Motts, given the fact that Motts weren't the authors of the matrix, I assumed that they had come up with these points and not-- and by that time, Hulley & Kirkwood were gone. They were off.

Q You mentioned Hulley & Kirkwood, the original authors of the matrix, and you describe them as being off by this point. Was that a problem? I mean, do you think it would have been helpful to have had Hulley & Kirkwood around to discuss the matrix?

A I've seen this happen before, so you're asking me my opinion, which is that you need to treat it with a piece of salt. I don't think it's a great idea to have somebody prepare either an enquiry or a reference design and not keep them in place.

Q You say, "not a great idea." Could you give us the reasons why you think that?

A Okay. Well, given that the development of the reference design, I would have assumed, involved interaction between the

designer and the-- or the designer and the initial design team, and the clinicians, and potentially the FM people and the engineering people, etc. There's normally some knowledge shared there which is useful to then keep a hold of. Potentially, there could be reasons for a particular thing, which if you talk to the author, he can explain it away, you know, and help people understand it. But if you don't follow that course, you then have two sets of people. You have ourselves on the designer side, but also on the client side you have someone else who's trying to interpret what's behind the figures, but it's not the only hospital this has happened at.

Q If we can look in particular at the Board's comment number 7. It is about halfway down that page.

A Oh yeah, yeah.

Q What it says there is, "Bedrooms 4ac/hr, SHTM says 6 ac/hr." Now, that 6 air changes per hour, that is a reference to table A1 that we looked at earlier this morning.

A Yes. Yes, it is.

Q So what the Board is apparently doing here is highlighting a discrepancy between what the matrix says and what the SHTM says.

A Yeah.

Q And then it goes on to say a bit below that, “Bedrooms stated as positive pressure, SHTM says 0,” I take that as balanced, “or –ve pressure.” So, again, would you take that also as highlighting a discrepancy between what the matrix says and what table A1 recommends for these rooms?

A There is a difference there between what table A1 recommends, but in the package of information which we had, there was an explanation for the thought process behind the 4 air change rate, which complied with the minimum ventilation rate guidance, which is also given in SHTM 03-01, where they’re referring to occupancy rather than a strict air change rate. That resonates, given that the table that you are referring to in the SHTM also stipulates that you can have fully naturally ventilated rooms. As an engineer, you cannot have a fully ventilated room and guarantee the air change rate that you’ll get from that because of the external factors that are associated with wind pressure direction, just a couple of them.

Q So, if we just take a step back from that, what rooms did you understand the Board’s comment here to relate to?

A The single bed rooms, and I understand that because there was further dialogue on the single bed rooms themselves.

Q And did you understand that to refer to all single bed rooms in the hospital, or only to single bed rooms in particular departments?

A My understanding was it was throughout the hospital.

Q Could I suggest to you that you can read this comment as relating only to standard single bed rooms but not to such rooms in the Critical Care department?

A You could suggest that, but I don’t. Reading between the lines, I can’t see that myself, and I also have the knowledge that we carried out a review on the single bed room ventilation, which was at the request of the Board, and there was no such differential ever applied. It was a global reference, if you like, to the single bed rooms.

Q This might arise out of the way that you interpreted table A1 and SHTM 03-01 as we discussed earlier on, but if you look at this comment from the Board, at number 7, do you agree with me that the thrust of it is to ensure that these rooms comply with SHTM 03-01? That is what the comment is directed at.

A The comment, yes, is directed at that, but the way you've phrased that is as if there was a suggestion that they didn't comply. What I'm saying is that the 4 air change complied with guidance within SHTM 03-01. It didn't comply with the 6 air changes in that table you're referring to, but it did comply with the guidance.

Q So you are taking a broader view of the requirements of the guidance, but just if we look at that particular comment, what it is doing is pointing out that SHTM requires, according to the commenter, 6 air changes per hour and balanced or negative pressure.

A Yeah.

Q So whoever has drafted that comment has in mind a recommendation for 6 air changes per hour and balanced or negative pressure. That is why they have made the comment.

A I'm not sure about that. My own opinion would be that they were looking for clarification on where the 4 air changes came from, because the comment has been raised by someone who hadn't been, as I've explained, involved in the initial design strategy reviews with the end client.

Q Yes. So they're flagging

up 4 air changes as something different from what they would expect to see based on the way they've read the guidance.

A By the way they've read the guidance, yes.

Q Yes. What they have read from the guidance is 6 air changes per hour and balanced or negative pressure.

A Yeah.

Q Now, those are requirements that, according to A1 of SHTM 03-01, are for the standard single bed room.

A They are the guidance figures for the standard----

Q The guidance figures, the recommended figures.

A Yeah. This is-- the issue here is that the document is guidance, but there is other guidance. So, as a design engineer, you have to look at the various alternatives and come up with the most appropriate solution in conjunction with and agreement with the client.

Q What I want to put to you is that the comment has not been made by somebody who has in mind the Critical Care line in the SHTM table A1, because if----

A There was no discussion whatsoever on Critical Care at that

point in time, and we will come onto other discussions that did impact on that further down the line.

Q Okay, but just the way you took this comment, and it sounds from what you are saying the way it developed, you were taking this as a comment relating to all single bed rooms in the hospital, not excluding single bed rooms in Critical Care.

A Yes, correct.

Q Yes. I note the time, my Lord. It is just after one o'clock. That may be a convenient time to break.

THE CHAIR: Yes. We will take an hour for lunch, so we will try and sit again about five past two. Perhaps if the witness could be taken out.

(Short break)

THE CHAIR: Good afternoon, Mr. McKechnie. Now, Mr McClelland.

MR MCCLELLAND: Thank you, my Lord. Mr McKechnie, you will recall, I hope, that before lunch we were looking at the comments made by the Board on the Environmental Matrix in October 2014 and the response from IHSL. We maybe do not need to look at the document, but the responses that were on the right-hand column of that, were they prepared by you or your team in response to the Board's comments?

A I would say that certainly we responded to them, but there'll be possibly an influence from Multiplex and IHSL on the actual wording, but the gist of it would have been from ourselves.

Q Yes. So the technical gist of the responses, would that have been driven by Wallace Whittle?

A Absolutely. Yes.

Q In response to those Board comments, did you or Wallace Whittle prepare a revised version of the Environmental Matrix?

A We did, yes.

Q And if we could bring up on screen, please, bundle 4, page 220, and whilst there is nothing on that page to tell us this, the inventory tells us that this is an Environmental Matrix that was issued on 31 October 2014, so about a week or so after those comments.

A Right.

Q We see on this version that previous versions of the Environmental Matrix had a Hulley & Kirkwood logo on it, and this version does not have one. Was that one of the things that Wallace Whittle did around that time?

A Yes. Yes, that was the main thing that we did, was re-badged

it.

Q And why was that done?

A Well, if it was a document that was going to come from ourselves, then it would have had our own identification on it, not Hulley & Kirkwood.

Q We see this document here does not carry a Wallace Whittle logo or reference or anything like that.

A Yeah.

Q Any significance in that?

A None whatsoever, no.

Q What you say in your statement – and the reference is to paragraph 9 of your statement, which is page 413 of bundle 13 – you say there that, "Once the bidder IHSL and Multiplex had ownership of the Environmental Matrix then we were instructed to take it on board, not to revamp it." Who was it that gave you that instruction?

A Yeah. I've maybe not worded that as well as I could have. I don't think there was a formal instruction. There was an agreement between ourselves and Multiplex that we would take it on board as it stood.

Q Okay. So, the idea of taking the matrix on board and not revamping it, that was something agreed between Wallace Whittle and Multiplex?

A Absolutely, yes.

Q Are you aware of whether that emanated in any way from the Board, or had that arisen on the bidder side of things?

A I'm not aware of that from direct discussion. I'm only aware that what I was told was that the Board were wishing IHSL to take ownership of the Environmental Matrix, and this was the process of taking on board that ownership.

Q If we go back to bundle 4, page 221, please, this is the page of guidance. Again, if we could just expand that text so that it is readable, please, and if we could just-- that is right. That is fine, thank you. We see here the guidance notes from that version of the matrix prepared by Wallace Whittle at the end of October, and if we could scroll down, please, so we can see Guidance Note 26, please. If you are able to read the text, Mr McKechnie, could you please just take a moment to read Guidance Note 26 and let me know once you've done that.

A Yeah. Yes, I'm aware of the contents of that note.

Q And so was that a new guidance note inserted by Wallace Whittle?

A It was, as a result of the

review which had been held on the single bed ventilation strategy and the outcome of that review.

Q So was this in response to one of the points that the Board had raised in that note that we looked at before lunch, of comments?

A Yes. It was directly in response to the 4 versus 6 air change.

Q Can you just explain what the note means, please?

A Okay. Well, essentially, after that comment on the Environmental Matrix, we were requested to provide-- I can't recall whether it was a report in the first instance, but it certainly culminated in a presentation to the Board of the options which were available to them for the single bed ventilation strategy. That presentation took place and we agreed, or the agreement in my opinion was that the agreement was that rather than have the positive – marginally positive – pressure within the single bed rooms, that we would achieve a balance between the amount of air that was supplied in and the amount of air that was being extracted via the bathrooms in the rooms. That is what that note there is intended to record.

Q Okay. So, if we just keep that document on screen, and I will

refer back to the note from October of the Board's comments, and it was the one that we looked at this morning. It raised a couple of queries. One was whether it should be 4 air changes or 6 air changes.

A Yeah.

Q And the other one was whether the bedrooms should have a positive pressure arrangement relative to the corridor, or balanced, or negative.

A Yeah.

Q And you are saying this note was added by Wallace Whittle in response to that query being raised?

A Not directly in response to the query. It was added after. In response to the query, we were asked to and gave a presentation to the Board, particularly to Infection Protection, to present to them the options that they had. So, in essence, we played back to them what the result of what they had briefed in their Environmental Matrix would be. The Infection Control's concern at the time was that if you had a positive pressure within the bedroom, then that air would spill into the corridor. Thus, someone in the corridor potentially got contaminated air, let's call it, from the single bed room.

That we discussed with them,

how we could, as engineers, change that strategy if they so wished, and what came out of that discussion was exactly what's on that note there, where we balanced the extraction coming away from the room with the supply that was going in so that, in effect, they had a balanced system within the rooms. So, in essence, I was playing back their own briefing to them, which the inference was that that wasn't their then-current-- I don't know how they arrived at it first of all, but it wasn't their then-current requirement. The discussion was more – in fact, it was almost entirely – on the pressure regime as opposed to the amount of air changes.

Q Okay. There was quite a lot of information in there and so what I am going to try and do is just put it in order as I have understood it, and just check with you whether the understanding is correct.

A Yeah. All right.

Q So is it correct that in the Environmental Matrix issued by the Board with the tender documents the requirement was for positive pressure in the single bed rooms?

A Yes.

Q And the Board comments made at the end of October included a concern about having a positive

pressure arrangement in the single bed rooms.

A Yeah.

Q And, as you understood it, that was driven by concerns about the spread of infection?

A That was what was discussed at the meeting, yes.

Q As the Board's comment indicates, they referred to the SHTM guidance as indicating that the pressure balance shouldn't be positive but should be balanced or negative.

A Yes, again, on the guidance. Yeah.

Q Ultimately, that ended up with Wallace Whittle adding that note to the Environmental Matrix.

A It also entailed us increasing the extraction that was getting taken from the rooms to a higher figure to allow the balance to be achieved.

Q Okay. So the----

A The Board also queried the number of air changes within the bathrooms which they-- in the same thing, which was 3 air changes, from the SHTM. Hulley's or whoever had prepared the Environmental Matrix had lifted that to 10, and we explained that we thought that was the right thing to do, as 10 was more akin to a commercial hotel-style bathroom, and

that 3 was a particularly low extraction rate, particularly when it was a single occupancy. So there was a lot of discussion round about the whole set up in the single bed rooms.

Q Okay. If we maybe try and just separate those issues out: the Board had raised this concern, an infection-driven concern about positive pressure----

A Pressure, yes.

Q -- between single bed rooms and the corridor.

A Yes.

Q And, based on their interpretation of the guidance, had sought a negative or balanced pressure arrangement for those rooms.

A Yes.

Q And one of the purposes of the guidance note that you added in was to establish that the pressure arrangement for single bed rooms should be balanced?

A It was to record that that was a design strategy that we were adopting.

Q Yes. I think you mentioned a separate point there, which was the Environmental Matrix issued by the Board with the tender documents required 10 air changes per hour from the en suite bathrooms.

A Yes.

Q I think you were saying it had been identified that that was in excess of the recommended rate of 3.

A Yes.

Q Again, I am just replaying back what I have understood you to say so do not let me put words in your mouth. Your view at the time was, whilst that was a departure from SHTM 03-01, it was actually a higher standard and one that made sense.

A Exactly that. For the purposes of patient dignity, etc. then, yes, it made sense to have it the higher figure.

Q Now, again, your comment there, your Guidance Note 26 that we see at the bottom of the page, headed up, “Single Bedroom,” it does not specify any particular department. Did you understand the guidance note to relate to all single bed rooms in the hospital, whatever department they were in?

A Yes. There was no separate discussion or delineation of-- on a departmental basis of what we were speaking about.

Q If we look up to Guidance Note 15 above, do you recall this morning that when we looked at Guidance Note 15 in the earlier version of the Environmental Matrix,

we had a look at comments made there about humidification?

A Yeah.

Q Do we see here that there are still comments about humidification in the HDU Critical Care areas, but the comment is different from the previous version?

A Correct, because it takes on board the response that we got after querying it because the original one would have had the provision of a humidifier, which is quite a costly piece of equipment and it's quite complicated, and it's not normally recommended, except the exception to that being-- what's normally recommended is, like, don't supply it at day one, but leave it as a potential retrofit, and that's what we've captured on that note.

Q Okay. So, Wallace Whittle in this reissue of the Environmental Matrix have made a change to the guidance note to reflect the clarifications of the Board.

A The discussions that we'd had up to that point.

Q Okay. Do we see in Guidance Note 15, again, in the High Dependency and Critical Care areas, that there is a reference in there to SHTM 03-01, Appendix 1, and its require-- or its recommendation of 10

air changes per hour?

A Yeah.

Q What rooms or areas did you understand that figure of 10 air changes per hour to relate to?

A My understanding was that that figure related to isolation rooms, and it was-- at that point in time, we hadn't addressed it, but we did address that in later issues of the Environmental Matrix.

Q Why did you not address it in this issue of the Environmental Matrix?

A Well, it hadn't really been discussed to any degree that I can remember. It was something which, on an ongoing review of the matrix, it became apparent that that wasn't a comfortable note for us, hence we-- because although it says 10 air changes, there's no mention of the pressure. So it then, to our mind, became a note that had to be better clarified.

Q I mean, you said earlier, as I have understood it, that during the-- I think during the competitive dialogue phase you checked the key parameters of the Environmental Matrix.

A Yes.

Q Did these key parameters that you checked include

the guidance notes in the matrix?

A Yes. They would have.

Q So, during that checking period, was the reference here to 10 air changes per hour something that you noticed and gave thought to?

A If we had particularly noticed it – and, again, bearing in mind that we hadn't got down to the sleeves up and the nuts and bolts of the actual design, which followed on – then we would have flagged it up. The 10 air change by itself didn't ring any warning bells to us. It just seemed a poorly phrased-- oh, I'm sorry, I'll correct that. I don't think we actually even thought it was poorly phrased at the time. It just didn't really-- it wasn't abnormal to us because we still had to go into each of these departments in detail.

Q Just to be clear about it, you say that you understood the references to 10 air changes in these guidance notes to refer to isolation rooms. Why did you say you understood it to relate to isolation rooms?

A Because that's the only rooms which we would expect would have-- apart from, I think, there's one other room which is a treatment room, it's the only rooms where the 10 air change rate would resonate.

Q And was that view based

on the way that you construed SHTM 03-01 at the time?

A Well, it's based on our experience and on the actual figures which are contained within SHTM 03-01.

Q Okay. If we could move forward to page 222, please. Now, we see here a page that is headed up, "Room Function Reference Sheet."

A Yes.

Q The Inquiry has had an explanation from other witnesses about how this worked, but what was your understanding of the function of this sheet?

A The function of that sheet was to identify common repeatable rooms, which then allows you to pick a particular room, for example, a bathroom or a bedroom, which are the first two on there, complete the 20 rows – 20 plus rows – on the sheet and then apply that as a standard to the bathrooms and bedrooms in the various departments, such that you've captured the standard that remains the same throughout those departments. It should help to reduce the amount of compilation because you're talking about, I don't know, 40 rooms or 20-odd as opposed to 50,000 of them. So that helps take that 50,000 number way, way, way down so that you

reduce the compilation.

Q So this sheet and that function derived from the work done by Hulley & Kirkwood?

A Yes, this methodology had been put forward by Hulley & Kirkwood and I adopted it because it seemed a sensible thing to do. The only thing I take exception to is the titling of “Room Function.” I don’t think that’s a very good title, because it tends to infer a clinical function, but that’s not what this is. This is simply engineering.

Q Just to explore that, for example, if we look down the list of room functions in the left-most column, we have got various things that appear there, including, you know, “Diagnostic room,” “Ward Kitchen,” “Laboratory,” “Multi-bed Wards,” and so on. Do those not reflect different clinical uses?

A Not unless they were briefed. So, unless someone had indicated that one of those areas you’ve just spoken about had to be treated separately, and that would have to have been a direction from either the-- I would suggest from the client, from whatever base he had, then those rooms would all tend to have the same solutions applied to them.

Q You said you adopted it

because you thought it looked like a helpful thing. Does that remain your view in hindsight?

A It does, yes.

Q Now, down that list of room functions in the left-most column, if you look down it, you will see that there is no entry there for HDU, but that on-- we don’t need to bring it up on screen, but the version circulated by the Board with the tender documents did have an entry for HDU.

A Yeah.

Q And you explain in your statement that that was a Wallace Whittle decision to remove that.

A It’s because it did not appear to be a repeatable room or----

Q So that was a change made not in response to a comment from the Board, but something that Wallace Whittle decided to do.

A It was-- Well, as we were taking ownership of it, if we saw something which could be tidied up, let’s call it, then we would apply that.

Q So, HDU was taken out of the room function reference sheet, but the guidance note that we looked at a moment ago which referred to particular design criteria for HDU, that was left in place?

A Yes.

Q Why was that?

A That was left in place on the basis that it's not for—our interpretation of that term, HDU, would have been the isolation rooms. So, I don't have the isolation rooms on here primarily because they are cross-referenced to SHPN 04, but the High Dependency Unit would tend to suggest to me that it was an isolation room.

Q I am not sure I quite follow why, if you thought it necessary to remove HDU from this sheet in front of us, it did not follow that you would also remove it from the guidance notes.

A It's simply because on the left-hand side it refers to the room function, and on the left-hand column of the Environmental Matrix there are a number of room titles. HDU didn't feature on the room titles, therefore we didn't think it was correct to have HDU as a repeatable room function when there wasn't one designated as such, so we took it away.

Q But the Board had gone to the extent of including a guidance note that specifically referred to HDU. Would that not strike you as odd if the room function of HDU was not to be used?

A Not particularly because, with the hindsight of looking at that

note, I think the note is not very clear as to what they are covering with on what they term HDUs.

Q Do you mean the guidance note?

A I had this debate before, about the-- is it the whole of the Critical Care area? Which doesn't really stack up. So, again, where we could, we were trying to bring clarity to the situation here.

Q Are you acknowledging there that the guidance note referring to HDU, there was some ambiguity attached to that?

A With hindsight, I would say that now. At the time, we adopted it because we didn't want to, basically, rock the boat too much, because it didn't really have that much of an impact on what we were designing.

Q Okay. On that "Room Function Reference Sheet," if we look at the "Bedroom" entry, which is the second entry in the list, do you see that there?

A Yes.

Q The bedroom room-- If you look down the left-hand column, there is a "Room Function" for "Bedroom."

A Yeah.

Q Then if we read along that line, we eventually get to a column

which is headed up, “Relative Pressure.” Do you see that?

A So, where’s that? Could you open that up for me a wee bit? It’s just----

Q Yes. We maybe we need to zoom in a little bit.

A Yes. I do, aye.

Q Do you see that column----

A It says, “Balanced.”

Q It says “Balanced.”

A Yeah.

Q Was that a change introduced by Wallace Whittle?

A Yes, as a result of-- so that it correlated to the note 26, or whatever, and the discussions that we’d had on the strategy.

Q We do not need to do it, but if we looked at the version of the matrix circulated by the Board with the tender documents, what it said in that box, instead of “Balanced,” was “Positive.”

A “Positive.”

Q That change was made so that pressure arrangements were consistent with what SHTM 03-01 required for standard single bedrooms.

A I would say that the change was made so that it was consistent with what the Infection Control required their systems to be

operating at. It was through that discussion with them and representatives from the Board’s technical advisors that we arrived at that solution.

Q But it also happens to be consistent with what Table A1----

A Yes it does----

Q -- says.

A -- but, as I say, that’s there, but the primary reason for us changing it was to address that comment that had been made and health infections concerns.

Q The effect of it was simply to bring the pressure arrangements for single bedrooms into line with what Table A1 of SHTM 03-01 recommended.

A That’s what it did, yeah.

Q In line with your description of the way this sheet works, the change made here, for example, in relation to the pressure arrangements, would be replicated through the room-by-room part of the matrix?

A It should be, yes.

Q For any room that has a bedroom function.

A Any room with that title, and that-- yes. Basically, if you went to a bathroom-- if you go down to the Environmental Matrix, the bathrooms

should all be there. It takes an awful lot of the compilation, potential for error, away as well as allowing people to have an overview of the more general rooms.

Q So, on the particular change that we were talking about there for the bedroom room function, change of that relative pressure from positive to balanced-- that would be replicated throughout any room in the following part of the matrix which was given the room function of bedroom?

A It should have been, yes.

Q Yes. If we go to page 226, please. This is a bit tricky to achieve two things, which is to get the whole of the thing on the screen but also to have it readable. If we zoom in a little bit so that we can see the left-hand column, the bottom part of it, please. Yes, so if you stop there, that is fine, thank you. Now, this is the part of the matrix which deals with things, first of all, on a department-by-department basis and within departments on a room-by-room basis. Is that correct?

A Yeah.

Q We see here in the left-hand column, the code "B1." Do you see that?

A Yes. I see that, yes.

Q Yes. You understand

that to be the Critical Care department?

A Yes.

Q So, what we should expect to see here is that, for any rooms within this department designated with the room function of bedroom, the pressure will have been changed from positive to balanced. Is that correct?

A That's what I'm expecting to see, yes.

Q Yes, and that is simply a consequence of the change having been made in the room function reference sheet?

A Yes.

Q So the effect is that, for these rooms in Critical Care, the pressure requirement has been changed from positive to balanced?

A Yes.

Q Yes. Now, if I was to put to you that that change is inconsistent with what SHTM 03-01 requires for rooms in Critical Care, what is your answer to that?

A I don't believe that's the correct interpretation of SHTM 03-01.

Q Is that on the basis that the line in Table A1 for Critical Care, in your view, applies only to isolation rooms, and not----

A No. It's in line with what

we spoke about this morning, which was the clinical output spec as well, which is the bespoke and considered environmental guide as part of that, or the Critical Care area whereby there is no other reference that I can find to pressurised rooms being required other than the isolation rooms. I have also checked every other document that I can find which references this type of accommodation and cannot locate any pressurised room, other than isolation rooms, being required. So, it's on that basis we're reviewing this.

Q Okay. I will not ask you to repeat your evidence about those matters because I think we covered that clearly this morning but, just to be clear, in your view, the entries on this page are bedrooms in Critical Care which say the pressure arrangement should be balanced, and your view, for those reasons, is not inconsistent with SHTM 03-01?

A Absolutely. I think you also have to reflect that, within the Critical Care, there are single bed rooms, which are not designated as isolation rooms, as well as the four bed wards that the focus has been on.

Q Bear with me a second. So, just by way of example – this is quite tricky, given the scale of the

document – if you look down-- the third column that you see on screen there, if you read down from the top, you see, if you go down two or three entries, you see an entry for "Single Bed Isolation Cubicle."

A From the top? Yes, I do.

Q If you read along, you then get to a column which describes it as an "Isolation Bedroom."

A Yes.

Q Then carrying on all the way along, we eventually come to a box that says "10." Do you see that?

A Yeah.

Q Now, for fear of disrupting things, I will not ask for the document controller to move that, but if you take it from me, that column is headed up, "Supply (ac/hr)."

A Yeah.

Q So, what we see there is a parameter of 10 air changes per hour specified for something described as an "Isolation Cubicle."

A Yes.

Q That reflects your evidence, I think, that that is where you expect to see 10 air changes per hour.

A Yeah, because the next entry in there is what they've referred to as a "Gowning Lobby," and that is the method by which you give the pressurisation and introduce the air to

an isolation room. An isolation room is sitting as a box. You then have an entranceway, which is a gowning lobby, which acts basically like an air barrier. So, the air supplied into that gowning lobby, spills into the room but also, if you open the door from the corridor into the lobby, the air spills back out to the corridor, thus protecting the people-- or isolating, if you like, the people within the bedroom.

Q Yes. So, that is treatment of isolation facilities----

A Yeah.

Q Going back to that third column from the left, if we carry down a little bit to the fifth line, we see there, "Single Bed Cubicle." Do you see that?

A Yes.

Q Then, reading along, we see that that is given the room function of "Bedroom."

A Yeah.

Q Then carrying on all the way along, we see that it has got a pressure arrangement of "Balanced." Do you see that?

A Four air changes, yes.

Q Four air changes. Is that because, having been given the room function of "Bedroom," that particular room will reflect whatever parameters

are put into the room function reference sheet for a room of that type?

A Yes, that's correct.

Q Yes, and while we are here, if we look at the entry below that for "Open Plan Bay," which is-- that is just the----

A Four bed.

Q Yes, four beds. If we read along, we see that it has been given the room function of "Multi-bed Wards."

A Yeah.

Q Then if we carry on along, we see that it has got a pressure arrangement of "positive to ensuite."

A Yes.

Q So, that has been left unchanged from the Board's version.

A Yes.

Q Why was that left unchanged?

A At that point in time, there had been no review nor any reference to the four-bed ward areas. They were brought up separately. Again, we'll touch on that in the next portion, but they weren't brought up until we were actually under construction.

Q So, if we remember that list of issues raised by the Board in

October and the one-- number 7 that we looked at concerning pressure arrangements, you understood that to refer only to single bed rooms?

A That was my understanding, and that was what we presented, and at no time do I recall anyone ever specifically taking exception or asking for other information on the four-bed wards, and it was simply to do with the single bed wards.

Q Do I take it also that that issue about the pressure arrangements for single bed rooms having been raised did not prompt any reflection or consideration within your team about the pressure arrangements for the multi bed?

A Not at that particular point in time.

Q Not at that time?

A No.

Q This may be a difficult question to answer, but do you recall, in the period prior to financial close, if you were aware that the matrix referred to, in the guidance notes, 10 air changes per hour for Critical Care but only 4 air changes per hour for these bedded areas in Critical Care? Was that something you were consciously aware of at that time?

A No because, as I say, the

Critical Care 10 air changes would, in our opinion, have referred to the isolation rooms. The terminology might have been better, but that was what we were speaking about.

Q Now, apart from the entries in the Environmental Matrix itself allocating 4 air changes per hour to these bedded areas in Critical Care, was there anything else you were aware of to confirm that the Board had deliberately chosen that?

A Not at that point in time. There was-- I'm not going to get in front of myself, but there was a full review of every four-bed ward in that hospital when we were under construction. So, there was further dialogue, but not at the point in time that we're speaking about at the moment.

Q Some witnesses, but I think not you, have referred in this regard to a report by Hulley & Kirkwood about thermal comfort.

A There was a thermal comfort, yes, report that was prepared. My interpretation was that was more supporting the strategy of the 4 air changes and the openable windows.

Q Well, we can have a look at it and, just as a preface before we look at it, as I understand it, those other witnesses have taken this report

to support the view that 4 air changes per hour had been deliberately chosen for single rooms.

A Yeah. I think-- We couldn't find a definitive document anywhere that said we're going for 4 air changes, but the report that you're referring to records that it is 4 air changes in the energy, and it was-- primarily, they were looking at overheating in the rooms and what influence the potential open or not open window would have on that. So, to be frank, it had already been a done deal when they prepared that report.

Q If we just have a look at that report, it's bundle 4, page 184. So, we see here, from its title page, it is a Hulley & Kirkwood document.

A Yeah.

Q It has got their logo on it. It is headed up, "Royal Hospital" and so on. "Ward Room Thermal Comfort Analysis," and it is dated February 2012. Was this one of the documents available to you through the tender procedure, so far as you can recall?

A Yes. That document would have constituted part of the reference design information which we received.

Q So, were you familiar with that at the time, during the tender process----

A Yes. I'd read through it, yes.

Q Can I ask you this specific question? Do you consider this report to offer any support for having 4 air changes per hour specifically in Critical Care rooms?

A I don't think it touches on that, from memory from reading it.

Q If we go to page 188, we see the opening words there under the heading of "Introduction":

> "This study has been prepared by Jonathan McMillan [and so on]… The purpose of this study is to:
>
> "Determine peak annual internal temperature profiles for typical single ward room accommodation…"

We see there the reference applying to typical single ward rooms, and then it carries on:

> "…for the Reference Design Stage envisaged solution of providing ward rooms with mechanical ventilation and comfort cooled fresh air."

Under the heading of "Executive Summary," it says:

> "The profiles in Simulations 1 & 2 show that the internal temperatures in ward rooms can be maintained at comfortable

levels with 4 ACH (air changes per hour)…"

And so on.

A Yeah.

Q There is a reference there to temperatures in summertime being controlled between 22 and 25 degrees centigrade. As you understood it, is this report essentially about temperature control?

A That's exactly what this report is, in my opinion. It's not about ventilation. The concern was to demonstrate that you could keep the building at comfortable levels (a) with four air changes per hour, and (b) that the influence of the openable windows was negligible, and to address any concerns that, if you opened the window on a sunny May day, not like today, and you-- 30 degrees or whatever external, that it could impact on that. That's what I believe that report was doing. We also carried out an overheating analysis of the building as part of our detailed design further down the line.

Q In carrying out these temperature calculations, it proceeds on the assumption that four air changes per hour would be used.

A Yes.

Q If we go to page 194, please. What the report says here, just picking up halfway through that paragraph, it says that:

"A selection of rooms has been chosen to represent the likely worst case combination of;

- Exposure to solar gain
- Density of occupation.
- Provision of mechanically supplied cooled air."

That is on the basis that those are factors which would tend to have the biggest impact on temperature pushing it up. Is that fair?

A Yeah.

Q Reading on:

"As such critical care and high dependency type ward rooms which receive air change rates in the region of 10 ACH, have not been analysed in this study."

So, in other words, whatever conclusion is drawn from this report, it is not intended to say anything about rooms in Critical Care or high dependency. Do you agree with that?

A I don't agree with your interpretation. I would agree with what's been put down there, which is that they restricted their studies to the more common rooms of the single rooms. I don't read into that that they are excluding single rooms within

Critical Care. I really don't read-- in that because it doesn't say it.

Q Well, it does refer to those rooms getting air change rates of 10 air changes per hour----

A Of 10 air changes, yes, which, again, in my experience and in the interpretation of the documents, would refer to the isolation rooms, which is an entirely different style of engineering that's involved with them.

Q Okay. You refer in your statement – and I think you also said a couple of moments ago – to Hulley & Kirkwood having carried out energy use calculations on the assumption of 4 air changes per hour. Did I understand you correctly?

A We carried out energy-- There was basic energy consumption figures that had been calculated, but we also carried out our own predictions on the-- put it through our sustainability calculations. They don't tend to be-- There's two levels here: you've got to demonstrate compliance with the building regulations, and then there are also-- the BREEAM. One of the figures which influences that is your predicted-- sorry, not "predicted." That's the wrong word to use. It's your energy calculations. Now, having looked into that, the methodology of doing that, certainly in their own case,

didn't directly relate to the air change rates. What it does do is a comparator, a software comparator, which has standard templates which are applied to different wards, etc., and they then do a comparator to see if you are within the parameters that you expected of them. There is a separate exercise which is called a predicted study, and that sits outside of, I believe, what we're speaking about. I'm a wee bit hesitant there, to be frank with you, because it's normally handled by my sustainability experts because it's quite a complex subject. I know a bit about it, but I don't profess to be an expert.

Q Okay. I mean, it may be you cannot answer this question but, at the highest level and in the most general terms, were any of the energy calculations based on an assumption that there would be 4 air changes per hour in the single bed rooms?

A I don't think there was, no.

Q Okay. So, just trying to draw all of that together, apart from the Environmental Matrix itself stating that 4 air changes per hour were wanted in Critical Care rooms, was there any other information, as far as you are aware, to suggest that the Board had made a conscious choice to have 4 air

changes per hour in Critical Care?

A No, I'm not aware of anything else. There was nothing to the contrary within their Clinical Output Specification, which was probably the other key part of that briefing pack.

Q I think I know the answer to this question, but I will put it to you anyway. You say in your statement at paragraph 29-- we do not need it on screen, but for the record the page reference to that paragraph is bundle 13, page 421. You say that you did not see anything special about the Critical Care four-bed wards, "which would have suggested to me as an engineer that these were technically different from the other four-bed wards." If I could just put to you the mere fact that these rooms were in the Critical Care department, was not, in your view, enough to distinguish them from other such rooms in the hospital.

A There was nothing within the geometry of those rooms or, indeed, the finishes which were applied to those rooms which would have led me to believe that they were to be treated as pressurised rooms. I know for a fact that that wasn't the case onsite. There was no solid ceiling. There was no pressure resistant light fittings, so----

Q Okay. If we could go, please, to bundle 4, page 245. We see, here, an email from Graeme Greer of Mott MacDonald to various people. I think you can see, in amongst all the redactions, your name is in there. The email is dated 11 November----

A Yeah, I see me.

Q See you there. Yes.

A Yeah.

Q 11 November 2014, and Mr Greer says, "Notes attached from today's meeting," and if we just scroll down to the next page-- sorry, it may be the page after that. These appear to be the notes circulated by Mr Greer. Just take a moment to look at that and tell me if you recognise it.

A I don't honestly recall it, but I think it's fine that I have received it.

Q Okay. Mr Greer, in his email, had referred to a meeting on 11 November 2014, from which that was the output. When you see what is listed there, do you remember the meeting?

A No, I don't remember the particular meeting, but reading what you've put in front of me there, I would say that that was part of the commentary which we had taken onboard and another update in the matrix.

Q What we do see here is that there are broadly seven points on that list, and there had been 11 or 12 on the note following the meeting in October. Was there any significance in that?

A Now, there were so many comments made on that Environmental Matrix, it's hard for me to put it into chronological, in my head, dates. We had assumed that, if we took on Board the report's comments on the matrix and updated it, then that document would then have moved forward. The reality was that wasn't the end of the process.

Q One point which appeared on the October list but does not appear on this list from November is the point about 6 air changes in bedrooms rather than 4, and I just wondered-- was that because that particular issue was seen as having been resolved?

A To be frank, it depends on the date of that and the date of the meeting that we had with the Board and Infection Control and Mott MacDonald's people.

Q One of the points that we see on this list emerging from the November meeting, four bullet points up from the bottom, says:

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

That, perhaps, indicates that that particular issue----

A Sounds as if it was live at the time, yeah.

Q -- still remained live, had not been resolved----

A Yeah.

Q -- by that point. You can take it from me that those bullet points appear, more or less, word for word in one of the schedules to the Project Agreement, being the one setting out the reviewable design data. Is that something that you will be familiar with?

A Not particularly. That would've been directed to IHSL, Multiplex, and if there was comments, then it would have fallen through to ourselves.

Q Can you recall if the list of points there were incorporated into the reviewable design data schedule that perhaps indicates they had not been resolved by financial close? Does that accord with you recollection?

A No. At the financial close, my understanding was that-- we were advised that the building services information, in total, was to be part of

the RDD, but the fact that the Environmental Matrix became part of that RDD process hadn't registered with myself or my team at that point in time.

Q So, just to be clear about that, your understanding was that the building services information in its entirety was to be reviewable design data. Is that what you said?

A Yes, and by that I mean the ventilation solutions-- the actual physical detailed design drawings and specifications that we would normally prepare, not necessarily the matrix.

Q Yes, you did not understand the matrix. Did I understand, from what you said a moment ago, that that process of finalising the Project Agreement and what was in it, that was carried out by people other than you and it was not a process you were involved in?

A No, I don't recall being involved in it at all. I recall being told that we had to resubmit all of the detail design that was going into RDD, which didn't particularly surprise me because it was probably a good place for it to go anyway.

Q So, does that make sense, that process handled by Multiplex or IHSL in their negotiations with the Board?

A It was probably a combination of the two of them. I wasn't party to those discussions.

Q Okay. If we could look, please, at bundle 8, page 64. Do you see down at the bottom there an email from Liane Edward Scott, who I think is from Multiplex?

A She is. She is, yes.

Q It is sent to Ken Hall, also of Multiplex, 19 November 2014:

> "Motts have just informed the HAI scribe that the vent system doesn't comply with infection control because it relies on the windows being openable – can you shed some light or offer opinion?"

Then if we scroll up to read the email above, please, so, go on to page 63, we see, at the bottom of the page, Mr Hall forwards the email to you same day. He says:

> "Hi Stewart,
>
> Can you treat as priority the bedroom sketches for the vent before the door closes and we have no alternative but to comply with infection control requirements.
>
> Realistically I think we need:
>
> 1.0 Interpretation of SHTM for bedrooms.

2.0 Air flow movement under a few scenarios, natural vent, etc.

3.0 And how this impacts on the adjacent corridor ventilation"

And so on.

A That's exactly what we did.

Q Yes, so was this the issue about the pressure in the bedrooms?

A Absolutely.

Q Mr Hall, in forwarding on to you, said, "We've got no alternative but to comply with the infection control requirements." Do you agree with that?

A I would disagree with his terminology that the 6 air changes was a requirement. My agreement would be on the fact that where he says:

"Realistically I think we need:

1.0 Interpretation of the SHTM for the bedrooms [and]…

2.0 Air flow movement under a few scenarios."

That was what we took on board and presented to the Board.

Q Yes, so when he asked you to interpret SHTM for bedrooms, what did you take that to mean?

A I took it to mean that they were looking for an overview, which was exactly what we gave them, of what the SHTM recommendations were, and then to give them air flow movement under a few scenarios, which was what would happen if it was a purely natural event, what would happen if it was what they were looking at as briefed, which is what I did with them.

Q Did you recognise that you were dealing here with an Infection Control issue?

A I recognised that the query had been raised by Infection Control, yes.

Q When Mr Hall asked you to interpret SHTM for bedrooms in that particular context, did it occur to you that the significance of air pressure for Infection Control might be different for Critical Care bedrooms than for normal bedrooms?

A No, because, again, at that particular stage, I do not recall there being any differential being applied to any department, be it Critical Care or any other department within the hospital. This was, as far as I could see, an across-the-board solution for single bed rooms.

Q You have already explained your understanding that any different pressure requirements established by guidance for critical control (sic) would relate only to isolation rooms.

A Yes.

Q Just following on from Mr Hall's email, there is an email above from you, which I think is probably circulated within your team at Wallace Whittle, and I think probably intended in a humorous tone: “Told you wouldn't wait until RDDDDDDDDDD!!!” and so on. What were you referring to there?

A There had been discussions between ourselves and Ken about the interpretation of the bedrooms and, at that time, I felt it was getting put on ice, and I didn't want it put on ice. I wanted to get it out and get it resolved because, as explained, these are critical for me to then start to fulfill my duties as a designer, and I didn't want anything to go into RDD, which was a basic design parameter.

Q Specifically, what issue was it that you wanted resolved before?

A The ventilation rates to the bedrooms. If it was going to change to 6 air changes, then I had to brief my engineers to tell them that the

figures that they were going to use in the preparation of the detailed design was 6 air changes, or whatever figure it was going to be.

Q Just so I can be clear about it, were there two issues that you wanted resolved: the number of air changes for single bedrooms but also the pressure arrangements relative to the corridor?

A It was the ventilation; it was the balance between the two of them. So, the discussions that we had encompassed the pressure and the extent of the air changes that we're speaking about. That information's absolutely critical to me to move on to designing a bedroom system.

Q Was this a concern in your mind, the need to resolve all of this? Did that arise following the Board's comments in October raising the query on these particular issues, or was it something that you'd been concerned about before then?

A No, it arose after the concerns were first flagged up where there was then appeared to be, let's call it, a change of mind from the briefing, which I was wanting to get resolved.

Q Okay. In January 2015, Wallace Whittle prepared an air

movement report, and if we just go to that, please. It is at Bundle 8, page 66. Do you recall this report?

A Absolutely, yes.

Q Could you explain to us, in overview, the purpose of this report and what, in your view, it established?

A The purpose of the report was to play back to the client group what they had briefed they wanted the ventilation figures to be. To help them understand that, we also gave them the guidance on what the SHTM 03 gave in the table 1, and then we played through various scenarios in order that we addressed their concerns. The particular concern raised was this question of the pressure relationship between the bedroom and the adjacent corridor. Then they had briefed it as positive, but HAI-SCRIBE had then taken the view that it would be better to be either negative or balanced, so we then looked at what we could do with the systems to achieve that in order that we could refine our design.

Q Okay. If we go forward to the conclusion at page 67. I will maybe ask you, in your own words, to explain what you understood the conclusion of the report to be.

A The conclusion was that

if they wanted to guarantee that they had a balanced system irrespective of the position of the windows, bearing in mind that the windows have-- I think it's a 100 millimeter restrictor on them, then the best way I could see of giving them that was to increase the extraction rate through the bathroom such that we essentially took out of the room as much air as we were supplying into the bedroom. That then gave them a balanced condition.

Q I, rather, read the conclusion in the following way: that if positive pressure from the bedroom was to be avoided, then the windows or the trickle vents would have to be left open. Is that correct?

A If they had left the system as it was then briefed with 10 air changes in the bathroom. So, in order to negate what you're speaking about, our recommendation was that you could forget the windows' impact because you can't guarantee whether they're going to be opened are closed because it's at the discretion of staff and patients. Balance the two systems, and then you shouldn't have that concern.

Q Again, in line with what you have said so far, can we take it that, in preparing this report, you did

not apply any different considerations to rooms in the Critical Care Department?

A No. We didn't, no.

Q Now, if we could go to page 78 of bundle 8, please. Again, you are not the sender or recipient of these emails, but I think you are copied in. At the bottom, we see an email from Ken Hall to Maureen Brown of Mott MacDonald and Janice MacKenzie of NHSL, and what he says is:

> "As per meeting of Tuesday 13.01.15 and our request for clarity on negative/positive pressure regime within the bedrooms, we attach the sketches distributed at the meeting and seek confirmation/acceptance from the NHS review with infection control."

Just briefly, were these sketches that Wallace Whittle had produced?

A They would have been, yes.

Q Can you recall what they were intended to show or what they did show?

A From memory, they showed the direction of air travel under the various scenarios.

Q This email----

A I think they were taken from a presentation that I did on that report that we just looked at.

Q Okay, and we see that Mr Hall's email requests confirmation or acceptance from the NHS with Infection Control, and then the reply from Mr Hall above it, 29 January 2015, from Maureen Brown at Mott MacDonald:

> "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.
> - 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."

What did you take from that response?

A The first three points, they are aligned exactly with what I've just spoken about where the critical factor, which came under discussion, was the pressure. Within the report, we had excluded the impact of the opening windows because they were a variant with little or no effect, and "the single room ventilation design shall comply with the parameters set out in the SHTM 03-01," that didn't, in my mind, trigger something that said it had to be all in accordance with the table, but rather with the recommendations of 03-01, which the 4 air changes, in my opinion, accords with. So, I believe that we had-- and, I think, as did Ken believe that we had addressed their concerns. The reference to the isolation room sits outside of the single rooms that we're speaking about, so it's those three points which are the critical ones in that response.

Q Is it fair to take the Board's response as simply saying, "We want you to comply with SHTM 03-01?"

A Yeah, you could have taken it in simplistic terms there and said, Well, we rescind the direction we

gave you in the briefing Environmental Matrix, and make it comply with 03-01," which, in essence, is what we did.

Q Okay. Financial close occurred in February 2015. Project Agreement concluded at that point. I take what you said earlier about, I think as far as you recall, that that was not a process that you were directly involved in.

A No, the discussions, etc., we weren't involved with that whatsoever.

Q Yes. Were you aware – and you may not be and, if not, just please say so – that in the Project Agreement there was a derogation from the obligation to comply with the Environmental Matrix?

A No, it doesn't ring a bell. No.

Q You were not aware of that?

A No.

Q If I could ask you, please, to have a look at the paper-- this is a document in the paper part to bundle 5 at, first of all, page 3836. Sorry, page 3836. Mr McKechnie, these are the Project Company Proposals from the Project Agreement. Were you aware that those proposals included a derogation register?

A It doesn't resonate with me, possibly because, I think, if we had any, there were very few derogations that we were looking for against the reference design. I can't read that. It says-- There may be something in there. I certainly can't see it there.

Q Well, it is okay. We are going to go to a particular page. This is just the register of all of the derogations, and if we could go to page 3861, please. If we can just zoom in on that so we can read it clearly, please? So, we see this is headed up, "Derogation Request." The first box is the clause in the Board Construction Requirements concerned with mechanical and electrical engineering requirements. You recall that that is the one we looked at earlier on which says that Project Co was to provide the works to comply with the Environmental Matrix. Do you recall that provision of the BCRs?

A I recall that, yes.

Q Yes, and if we read down there is a box headed up, "Derogation":

> "Anomalies within the environmental matrix have been reviewed and proposals incorporated within the room data sheets (refer to schedule for proposed variations)."

Having seen that now, do you recall this derogation?

A I certainly don't, but it appears to be more pointing at room data sheets, which we had very little input into at that particular point in time.

Q Insofar as this document refers to anomalies within the Environmental Matrix, are you able to cast any light on what that refers to?

A No, I think that you would have to ask the author of the room data sheets, bearing in mind that there wasn't a complete pack of room data sheets for the entire building until later on in the contract.

Q Bear with me, Mr McKechnie?

A Sure.

Q You may not have been aware of that derogation, but you were aware, I think, that certain things relating to the mechanical and electrical engineering elements form part of the reviewable design data.

A That's correct, yes.

Q Yes. Were you involved in the decision about what was to be made part of the reviewable design data?

A No, I don't believe so. Our focus was on the matrix.

Q So, did anybody ask you about the idea of having the Environmental Matrix as reviewable design data?

A No, I don't recall that discussion at all, because I did, and do, find it strange.

Q So, presumably, you did become aware at some stage that the matrix had been included in the reviewable design data?

A I did, yes. Yes.

Q You said you were surprised by that. Can you just explain what you made of that decision and why you were surprised about it?

A I was surprised on the basis that, and I'm still surprised that, you could consider a client brief or to go into contract with someone with a document which basically provided a performance standard and have it open-ended that that performance standard was going to be reviewed further down the line. That's contrary to my understanding of any employer's briefing document I'd seen before.

Q On the basis that, until the client's brief is finalised, you do not know what you are contracting to provide?

A Yes. From my own point of view, until that client brief is formalised, I can't really pass go on preparing the detailed designs, which, given the point we were at in the contract, we're obviously at the next stage of my design development.

Q Would it have been your expectation that the reviewable design data would be confined to Project Company's Proposals?

A I was anticipating once they said that the building services were to be classified as reviewable design, that my layout drawings and my detailed design proposals, which consisted, basically, of the drawings for the various departments and how we were going to engineer them-- That is what I was anticipating would come through in RDD, and that was the bulk of RDD.

Q Once you became aware that the Environmental Matrix had been included in the RDD, what did you understand to be the extent of revisals that IHSL were to carry out to it?

A What then transpired was that the Environmental Matrix then took on a life of its own where it was commented upon by the client team on numerous occasions.

Q As you appreciate, and I think the shortness of your answer reveals that you do appreciate, I do not really want to get into what happened after financial close. What I am interested in is what you expected the revisals of the Environmental Matrix to be concerned with.

A At that point in time, I was expecting, potentially, a one-hit to tidy the Environmental Matrix up to the agreement of all the parties, and then we would move forward. That was my expectation at that particular time.

Q If I was to put it to you that IHSL had the responsibility to review all of the ventilation parameters in the matrix and check them for compliance with SHTM 03-01, does that reflect your understanding of the task or not?

A No, what I'm referring to, if I've picked you up correctly, is that-- given the comments that we'd already received, which traced their life back to the matrix, was that there would have been normally another batch of comments which we would have reviewed, taken on board, revised the Environmental Matrix, and then it should have been put in a drawer as the agreed brief to go forward.

THE CHAIR: Sorry, it is my fault. I lost concentration there. Could you just repeat that answer? I think Mr McClelland put to you that IHSL had the responsibility to review all the ventilation requirements. I think you then said, "No." What did you go on to say?

A My interpretation of what was to happen at that point in time would be that there would be another batch of comments on the matrix by the Board which we would then have addressed, and at that point I would expect we should have been able to finalise the matrix and close it down, and we then had a defined client's brief and design brief for my engineers to then take that on board and start to develop the detailed designs.

Q Thank you.

A It's a fundamental step in any project.

MR MCLELLAND: Okay. If we could have, please, bundle 5, page 14. This is the Project Agreement, Mr McKechnie, and do not worry, I am not going to ask you what it means. That is a matter for the lawyers, but if you could just have a look at paragraph 7.3.1, what it says there is that:

> "Project Co [so IHSL] acknowledges and confirms that it has conducted its own analysis

and review of the Disclosed Data and has, before the execution of this Agreement, satisfied itself as to the accuracy, completeness and fitness for purpose of any such Disclosed Data upon which it places reliance."

Now, that clause refers to a category of information called "Disclosed Data." If we just proceed on the basis that that includes the Environmental Matrix, to what extent, as far as you know, did IHSL carry out its own analysis and review of the Environmental Matrix and satisfy itself as to the accuracy, completeness and fitness for purpose of any of the information in it?

A I can't obviously comment on what reviews IHSL had undertaken. I would expect that they had written that in mind with our own comments that we had. We did not have any particular queries on the Environmental Matrix as it stood at that time. That was demonstrated by the fact that it was the Board that continually came back with queries and comments on the matrix, not ourselves.

Q It might be said that that clause means that if IHSL, by that I mean the whole IHSL consortium, elected to use the Environmental Matrix parameters that they received with the tender documents, they did so at their own risk that it was fit for purpose. To what extent did you consider that that was a risk that the contractor team had taken on?

A I didn't see the risk in that. I saw the risk in the client coming back and asking for alternative, as it transpired, solutions to the briefed Environmental Matrix.

Q Okay. The Project Agreement at financial close included room data sheets for generic and key rooms. Were you aware of that?

A I was aware of it towards the end of the process.

Q These included room data sheets for what I am going to refer to loosely as the bedded areas in Critical Care, and consistent with the Environmental Matrix, they show 3 air changes per hour for those rooms. Again, is that something that you were aware of? Had you seen these room data sheets?

A I don't recall seeing the room data sheets, given the fact that we were all pulling separately to get the overall package together, but it doesn't surprise me that it said the 4, because that's what they would have

taken, or the architect who was compiling these would have taken from the matrix.

Q Do you know who it was that put the room data sheets together?

A It was the architect, HLM.

Q And does that include the elements, the environmental parameter pages of the room data sheets?

A Yes, I believe it did, yes.

Q Do you know by what process they put the room data sheets together?

A I don't, sorry.

Q Do you know if they started with an output from the Activity Database? **A** I'm sorry, I really don't know how they pulled them together, whether they took the ADB sheets and revised them. I suspect that's the case, but I really don't know.

Q Do you happen to know that if they had taken sheets from the Activity Database, if they would have been pre-populated with an air change figure?

A Again, I really couldn't comment, because the-- downloading the ADB sheets is not something that, as a practice, we would normally do.

Q Now, the Board's position, as I understand it, is that

there was an error in the Environmental Matrix which made it non-compliant with the guidance. I appreciate you disagree with that view.

A I don't disagree with the statement that there was an error. I don't necessarily understand what that error was. So, when they say there was an error, was it an error that they had briefed Hulley & Kirkwood to go for a particular figure which didn't transpire and then continue its life onto the reference design Environmental Matrix? So, I'm not trying to evade the question there, but the terminology used is a bit too vague for me to tie that down. I don't see the error as such against the SHTMs or the guidance.

Q I probably put the questions very badly. I think you would accept that the Environmental Matrix was at the root of difficulties on this project, if I could put it that way. Do you agree with that?

A Yeah, I would agree that it was one of a number of things which seemed to take a lifetime to resolve, yes.

Q Maybe this question is difficult to answer if we do not have a precise agreement about what the issue with it was, but I was just going to put to you, in relation to the use of

Environmental Matrices, is there anything that you could say in hindsight might have helped those problems be avoided?

A In this particular instance-- in fact, in any instance, I think that it would have been useful if there had been a design strategy statement prepared which helped define the parameters which had been part and parcel of discussions between the original reference designer and whomsoever it was that helped them compile the Environmental Matrix. I'm speaking from experience, in my opinion, it would be normal as a designer to play back to a client what I felt they had agreed to in order that I could then move forward. I didn't see any of that. It may exist. I'm absolutely not saying it doesn't exist, but I don't recall that we were ever privy to seeing that, and that would have assisted.

Q Are you really saying there it would be helpful to know what was in the mind of the person who created the Environmental Matrix?

A Well, that would-- well, I see that as a stage before you prepare an Environmental Matrix that you would've-- again, from experience, you would tend to have general conversations with the clinicians, if

appropriate, and the engineering staff when you were developing the strategy. At that point in time you would normally – I would normally – play back that strategy to the other side of the room and say, "Look, have I interpreted what you're speaking about correctly? Let's just, you know, get that bottomed out," in case you'd misheard or they had a change of opinion, and that, I think, would have been very useful.

Q Mm-hmm. Again, I am not trying to put words in your mouth, just trying to make sure I have understood it. Is that another way of saying that it would have been helpful for you performing your role to have had access to the end user of the ventilation system? Or to have had some document recording----

A At the point in time, under the circumstances of trying to assist somebody essentially pull a tender together, it's not really that practical to have that degree of involvement, bearing in mind that you're in a competitive situation, so it's not just your own group that would have to have that. The other tenderers, or whatever, would also need that same access, which is pretty impossible to achieve.

Q Okay, Mr McKechnie,

thank you very much. I do not have any more questions for you at this stage, but there is usually an opportunity for others to indicate if they may have questions, so just stay there for the moment.

A Okay.

THE CHAIR: Mr McClelland, what we have done earlier in the week, as you are aware, is break for about 10 minutes, just to check that nothing has arisen, and allow the witness to be in the witness room for that period. I take it the same considerations apply.

MR MCCLELLAND: Yes, I am content to proceed in that way.

THE CHAIR: Mr McKechnie, you may have no more questions to answer, but if you would allow us another 10 minutes, then you will be taken to the witness room.

(Short break)

THE CHAIR: Mr McClelland?

MR MCCLELLAND: Thank you, my Lord. I am grateful to Mr McKenzie on behalf of Multiplex for suggesting essentially a short clarification which I am content to put to the witness.

THE CHAIR: Right. (After a pause) Mr McKechnie, I think just one further question will be asked by Mr McClelland. Mr McClelland?

Q Thank you for coming back Mr McKechnie. This will be brief, I hope. Could I ask you just to clarify your understanding of the extent to which at financial close the Environmental Matrix was reviewable design data? In particular, did you understand it to be reviewable design data in its entirety or only to the limited extent of comments that the Board had made?

A My understanding-- I need clarification, are we speaking about the point where the Environmental Matrix moved into RDD territory, or are we speaking about the point earlier on in that process?

Q Specifically at financial close when the Project Agreement is concluded, at that point in time?

A At that point in time, I did not personally understand that the Environmental Matrix was to be classified as reviewable design data at all.

THE CHAIR: At all?

MR MCCLELLAND: You were not aware of that at financial close?

A No.

Q At the risk of breaching my own stricture of not asking about the period after financial close, do you recall when you did become aware that the Environmental Matrix had

become reviewable design data?

A This is part and parcel of the discussions that we then started in the reviewable design data with the client's technical advisors.

Q Okay. Well, in that case, I have no further questions for you, Mr McKechnie.

A You sure?

Q I think I am sure.

THE CHAIR: I think you are entitled to hold him to that, Mr McKechnie. Before allowing you to leave, can I say thank you? Thank you for attending today and giving evidence over quite a long time, which is an arduous thing to do, but more arduous is the preparation that you will have done in order to put yourself in a position to give evidence. I am particularly grateful for that. So, with my thanks, I will invite you to leave us.

A Thank you. I hope I helped. Bye.

(Session ends)

15.40