

OPUS 2

INTERNATIONAL

Grenfell Tower Inquiry

Day 10

March 9, 2020

Opus 2 International - Official Court Reporters

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1 Monday, 9 March 2020
 2 (10.00 am)
 3 SIR MARTIN MOORE-BICK: Good morning, everyone. Welcome to
 4 today's hearing. We're going to continue hearing
 5 evidence from Mr Crawford in just a moment, I think. So
 6 could we have Mr Crawford in, please.
 7 MR NEIL CRAWFORD (continued)
 8 Questions from COUNSEL TO THE INQUIRY (continued)
 9 SIR MARTIN MOORE-BICK: Good morning, Mr Crawford.
 10 THE WITNESS: Good morning.
 11 SIR MARTIN MOORE-BICK: I hope you're ready to carry on.
 12 THE WITNESS: Yes.
 13 SIR MARTIN MOORE-BICK: Thank you.
 14 Mr Millett.
 15 MR MILLETT: Mr Chairman, thank you.
 16 Mr Crawford, good morning.
 17 A. Good morning.
 18 Q. I want to turn next to Exova and your dealings with
 19 them.
 20 You worked with Exova on the KALC project, didn't
 21 you?
 22 A. That's correct.
 23 Q. Was it you who recommended Exova, that they work on the
 24 Grenfell Tower project?
 25 A. No.

1

1 Q. Do you know who did?
 2 A. No.
 3 Q. Do you know anything about how Exova came to be involved
 4 on the KALC project at all?
 5 A. I believe there was ... I believe there was
 6 an indication early on that there was a certain
 7 convenience in transferring the same consultant team
 8 across. I think we had that from the earlier --
 9 Q. On the KALC project, I meant. Who got Exova involved
 10 originally on the KALC project?
 11 A. Oh, sorry. Gosh. I don't recall.
 12 Q. Okay.
 13 What was your overall impression of the quality of
 14 Exova's work on the KALC project?
 15 A. The project was complicated by the fact that there was
 16 a requirement for -- there is -- well, there's
 17 discussion of various strategies in terms of escape that
 18 involved sprinklers or not using sprinklers, and then
 19 there were complications in relation to the engineering
 20 strategy to accommodate that. So it wasn't
 21 straightforward. There were a number of revisions done
 22 to the strategy to get that resolved.
 23 Q. Can we please go to {SEA00004053}, please.
 24 This is an email dated 24 April 2012, and you are
 25 copied in on it, if you see the list of copy-ees.

2

1 A. Yes.
 2 Q. It's sent to Terry Ashton of Exova. You can see the
 3 attachments and the subject matter, it's "KALC &
 4 Grenfell Tower upgrade", so it's at a time when both are
 5 being considered.
 6 In the second paragraph you see that Bruce Sounes
 7 says to Terry Ashton:
 8 "We have thus far had no commitment in writing from
 9 you to a fire strategy on either the KALC leisure
 10 centre, Academy, Residential development or the Grenfell
 11 Tower upgrade. We have had no concrete input by way of
 12 drawing markups or draft reports to support the
 13 developing designs. This is becoming critical for us
 14 with three weeks to go before we submit the Stage D
 15 Report for KALC, with much of the work undertaken so far
 16 by the whole team relying on the fire safety advice
 17 we've received at meetings. We fear that the designs
 18 have not had adequate scrutiny and that we are at
 19 considerable risk at this late stage of late changes,
 20 abortive work and possible cost implications to the
 21 project."
 22 Then in the third paragraph, Mr Sounes says:
 23 "If you are unable to reassure us that you are
 24 committed to the two projects by the end of this week --
 25 both agreeing contract terms and providing detailed

3

1 advice - we will regard this as a renunciation of the
 2 commission and be forced to look elsewhere for fire
 3 safety ..."
 4 My first question, Mr Crawford, is: when you were
 5 copied in on that email, did you read it?
 6 A. That's eight years ago. I mean, probably.
 7 Q. Do you remember reading it, do you think?
 8 A. I don't. I mean, I have to say, Andrzej and Bruce were
 9 more involved with setting up the projects, in terms of
 10 managing consultants and bringing them in. I would have
 11 been copied in -- I would have -- I probably would have
 12 read it, yes.
 13 Q. Right.
 14 Now, it was Mr Sounes' evidence that he was passing
 15 on a concern to Mr Ashton from the KALC team. Was that
 16 your concern, that Exova had not provided adequate
 17 scrutiny of the drawings for KALC?
 18 A. I can't recall.
 19 Q. Was it your concern that Exova had put in no concrete
 20 input on KALC at that stage?
 21 A. I don't recall.
 22 Q. Did you have any discussions yourself with Mr Ashton or
 23 anyone else at Exova at that time regarding resourcing
 24 issues?
 25 A. Not that I'm aware of.

4

1 Q. Did you discuss the contents of this email with
2 Mr Sounes at all?
3 A. I can't recall.
4 Q. Okay. I mean, against the background of what is said in
5 this email to be Studio E's, at least, dissatisfaction
6 with Exova's work on the project in the way they set out
7 there, do you know why you recommended them for the
8 Grenfell Tower project?
9 A. I didn't personally recommend them.
10 Q. You didn't.
11 Do you know why you were content with them to be the
12 fire engineer on the Grenfell Tower project?
13 A. I would have said the job they did ultimately in KALC
14 was pretty good.
15 Q. Did Exova do anything in response to this email to allay
16 your or Mr Sounes' concerns as expressed there in that
17 email?
18 A. I couldn't recall.
19 Q. Could we please turn to {LBI00000620}, and go to the
20 bottom email in the chain, which is at the bottom of
21 page 2 {LBI00000620/2}.
22 Now, this is an email of 10 October 2012 from
23 Colin Chiles of Leadbitter to Andrzej Kuszell. Now, you
24 weren't copied in on that email; you were copied in on
25 the email above it, but I'll just show you this one to

5

1 start with. This is from Colin Chiles:
2 "Andrzej
3 "I have still to receive a satisfactory response
4 from the design team with reference to the concerns
5 raised by the GAG. Our client requires us to deal with
6 this and I am not willing to commence the works until
7 I receive demonstration that the fire safety of the
8 estate has been considered with on the design. This is
9 a clear requirement of the CDM Regulations. The
10 response received from Exovia[sic] is in my opinion
11 casual, should I issue this to GAG it would further
12 exacerbate an already high project risk.
13 "I must have a proper response regarding
14 consultation with BC and LFB by return.
15 "Regards.
16 "Colin C."
17 Then if you look above it {LBI00000620/1},
18 Mr Kuszell replies, and you were copied in at that
19 point. If you go to the top, you can see, just running
20 right from the very top of the page, Colin Chiles sends
21 the email string below it to you, and then, two below
22 that, you can see that Andrzej Kuszell responds to him,
23 and above that is your response to Andrzej Kuszell and
24 Colin Chiles, just to set the context.
25 What Mr Kuszell says -- if the operator can move

6

1 down to that one, "Colin", that's right -- if we look at
2 that:
3 "The safety of the estate has been considered ..."
4 If you look six lines down you can see that
5 Andrzej Kuszell says:
6 "As you know the separate Grenfell Tower commission
7 is running behind KALC, with designs currently sitting
8 at stage C and BC/LFB consultations still to occur. As
9 far as we are aware, with the proviso on the Grenfell
10 landscape, the proposed Academy and Leisure developments
11 are not impacting on the fire safety of the estate.
12 I have asked Neil to get back to you on the details of
13 the KALC BC/LFB consultations held to date."
14 You then write to Andrzej Kuszell and Colin Chiles
15 on the same day, 10 October, and you say:
16 "Colin
17 "Our contacts at RBKC have been John Allen and Dave
18 Gammon ..."
19 And you explain that. Then you say:
20 "Following an initial meeting with building control
21 on 28th October 2011 I did ask the question in relation
22 to fire access to and around the Tower (see attached)
23 however this was not formally responded to although we
24 were led to believe all access is from Grenfell Road."
25 Then Colin Chiles' response to that, above that on

7

1 the page, as you can see there:
2 "Thanks Neil.
3 "I'm afraid we need a formal response from RBKC
4 please chase this."
5 Now, I've shown you the whole email string. Do you
6 remember reading Mr Chiles' email when you received
7 Mr Kuszell's reply?
8 A. From eight years ago, no.
9 Q. No.
10 Do you accept that Mr Chiles' concerns about Exova's
11 performance, which are set out at the bottom of page 2
12 {LBI00000620/2}, which I read to you, should have put
13 you on notice as to Exova's somewhat less than thorough
14 approach at that stage?
15 A. Well, certainly they might not have been as mobilised to
16 the extent that they might have been at that point.
17 Q. Right.
18 Going forward in time just under two years to the
19 summer of 2014, when you took on the Grenfell Tower
20 project, do you remember whether, during your handover
21 discussion with Mr Sounes, you had a conversation with
22 him about the involvement of Exova in the Grenfell Tower
23 project?
24 A. Possibly. I was aware of the fire report.
25 Q. Was it your understanding at that stage that Exova had

8

1 been instructed to assess fire safety issues as they
 2 pertained specifically to the overcladding of
 3 Grenfell Tower?
 4 A. I understood that they produced a high-level
 5 fire strategy report.
 6 Q. Is that something that Mr Sounes told you?
 7 A. It's pretty much mandatory in any project of that nature
 8 and complexity.
 9 Q. Right.
 10 When you came into the project -- so we're looking
 11 at July/August 2014 -- did you ask Mr Sounes to see the
 12 fire strategy reports that Exova had produced so far on
 13 Grenfell Tower?
 14 A. I'm not sure if I asked him, but I would have read them
 15 at some point.
 16 Q. Do you remember when you read them?
 17 A. Specifically, no.
 18 Q. Was it your understanding that Exova would in future be
 19 producing advice on the application of regulation B4 of
 20 the Building Regulations 2010, "External fire spread"?
 21 Is that your understanding at the time?
 22 A. I'm not sure.
 23 Q. You're not sure as in you can't remember, or you can
 24 remember not being sure?
 25 A. Well, my understanding is they would have had the

9

1 fire strategy report and I would have read that fairly
 2 early on. It's always a priority to understand --
 3 I mean, specifically B1 and B5 issues. I mean, they're
 4 very primary to any scheme, particularly where there is
 5 any complexity, so you would look at those and
 6 understand those and get your head round them as part of
 7 coming into the project, if you like. So you would
 8 understand this.
 9 In terms of specifics to the façade, where it was
 10 relevant, you would also expect commentary on that.
 11 Q. Yes.
 12 Again, I'm just focusing on the moment you came into
 13 the Grenfell Tower project, July/August 2014. Did you
 14 think or expect that Exova's work would cover the
 15 entirety of the Grenfell Tower project or just a part of
 16 it?
 17 A. I would expect it to cover where it was relevant.
 18 Q. Where it was relevant?
 19 A. Yeah.
 20 Q. So all of it, where it was relevant?
 21 A. Yes.
 22 Q. I see, thank you.
 23 Now, when you came into the project, summer of 2014,
 24 did you know that Exova had at that point, so far,
 25 produced five fire safety strategy reports? I'll just

10

1 list them for you: there's a report on the existing
 2 fire strategy for Grenfell Tower of August 2012;
 3 a design note in September 2012; issue 1 of the outline
 4 fire safety strategy for the refurbishment,
 5 31 October 2012; issue 2 of the outline fire safety
 6 strategy for the refurbishment of 24 October 2013; and
 7 then issue 3 of the same strategy dated 7 November 2013.
 8 I should also just be clear, the initial design note was
 9 also for the refurbishment.
 10 Now, there are five of those. Do you remember that
 11 at that stage, when you came in, there were five such
 12 reports which Exova had done?
 13 A. What I would do when I come into any project is look at
 14 the most recent fire report to understand the status of
 15 the project relative to the fire strategy at that time.
 16 Would I have gone back and read the historical ones?
 17 Not necessarily.
 18 Q. I see. We will come back to that in a moment.
 19 If you can go, please, to paragraph 71 of your
 20 witness statement, {SEA00014275/28}, you discuss
 21 an email exchange in September 2014 between Harley,
 22 Rydon and Studio E in relation to a request for
 23 information, an RFI, regarding horizontal firebreaks in
 24 relation to cavity barriers, and we will come back to
 25 that later in your evidence.

11

1 Can I ask for you to be shown page 29
 2 {SEA00014275/29}, within the same paragraph, where you
 3 say, third line down:
 4 "... in short, I contacted Exova, which was the fire
 5 engineer on the Project and produced the fire strategy
 6 reports."
 7 Do you see that?
 8 A. Yes.
 9 Q. "I would have contacted Exova as it is an authority on
 10 all things fire related."
 11 A. Yes.
 12 Q. Now, my question is: was it your understanding at that
 13 time that, prior to Studio E's novation, Exova was the
 14 "authority on all things fire related" -- your words --
 15 in respect of the refurbishment at Grenfell?
 16 A. Yes.
 17 Q. Did you have any reason to believe at that time that
 18 Exova's role had changed post-novation?
 19 A. No.
 20 Q. So when you refer here to the fire strategy reports, can
 21 you just be clear what you're referring to?
 22 (Pause)
 23 A. All the reports that they had created.
 24 Q. All the reports? Thank you. I think you say you had
 25 read those as part of -- is this right? -- your coming

12

1 into the project?

2 A. It's part of coming into any project. Personally,

3 that's what I always do, go straight to the

4 fire strategy to understand the fire strategy of the

5 project at the current time.

6 Q. Right.

7 A. I would have seen -- normally the way we file things, we

8 would have had a consultant folder and it would have

9 been labelled "Harley", "Exova", whoever it was, and you

10 navigate to there and look at the dates and read them.

11 Whether you would go back and read them all from the

12 start, as in revision 1, revision 2, revision 3,

13 possibly not. You would certainly look for the latest.

14 I may also have read it as part of the stage E

15 employer's requirements tender set that Bruce had as

16 a physical set on his desk.

17 Q. Yes, I see.

18 Now, let me take you, then, to the latest that you

19 say you would have read. In fact, I think you said on

20 Thursday afternoon last week that you had in fact read

21 it. That's, just for our own records, {Day9/136:13-20}.

22 If I can ask you to look at it. It's {EXO00001106}.

23 You can see there it's dated 7 November 2013, it's

24 I shall number 03, and it's a report to Studio E. Do

25 you see that?

13

1 A. Yes.

2 Q. When you first read that as part of your handover from

3 Mr Sounes, do you remember discussing its contents with

4 Mr Sounes?

5 A. Remember? No.

6 Q. Do you remember discussing anything with Mr Sounes about

7 Exova's input at that stage?

8 A. I can't recall, but it doesn't mean that I didn't or ...

9 Q. Can I ask you, please, to go to page 4 {EXO00001106/4}

10 under the introduction. It says there, do you see:

11 "The refurbishment comprises ..."

12 Just look with me, if you would, at it. There are

13 five bullet points. Bullet point 1 is "ground storey

14 level"; bullet point 2 is "mezzanine level"; bullet 3,

15 "walkway level"; bullet point 4, "walkway +1 level" and

16 "the creation of four new residential apartments"; and

17 bullet 5, "generally - improvements to the building

18 services".

19 Then it says:

20 "This report details the applicable statutory

21 controls in respect of fire safety and contains

22 an outline fire safety strategy for compliance with

23 these statutory controls.

24 "The report is based on discussions held with the

25 design team, the Royal Borough of Kensington & Chelsea

14

1 and on fire access and fire strategy drawings produced

2 by Studio E LLP."

3 Do you see that?

4 A. Yes.

5 Q. We can see, can't we, that the introduction section

6 doesn't make any reference at all to the overcladding of

7 the exterior of the building, does it?

8 A. No, but the last section does.

9 Q. The last section does?

10 A. As to the whole report.

11 Q. Okay. But when you're looking at the summary of what

12 the refurbishment comprises, and we can read it

13 together, we can see that it doesn't make any reference

14 to the overcladding.

15 My question is: did you note the scope of the

16 summary of Exova's report when you read it?

17 A. I believe it was within their terms of appointment that

18 they were to look at the cladding, or the external

19 façade.

20 Q. Indeed. Did you look at the terms of appointment when

21 you read this report? Did you put the two side by side?

22 A. I don't recall putting the two side by side, but Bruce

23 may have mentioned the terms of appointment.

24 Q. Bruce Sounes mentioned to you --

25 A. No, he may have mentioned.

15

1 Q. Right. Let me just be clear. When you had

2 a conversation with Mr Sounes at the handover, do you

3 remember having a conversation with Mr Sounes about the

4 terms of appointment?

5 A. As I mentioned earlier, I don't specifically remember

6 anything specifically in relation to the Exova report.

7 That's not because it didn't happen, but it's because

8 it's eight years ago and I don't have that level of

9 recollection.

10 Q. Okay, I understand.

11 Let me see if I can get at it this way: when you, as

12 you say you did, read this report and you looked at

13 "Introduction", do you remember what your thoughts were

14 about the scope of the work Exova had been asked to do?

15 A. I don't know. To me, it just reads like a fairly

16 standard sort of generic introduction description of the

17 project.

18 Q. Right.

19 You knew -- and I'm suggesting this because I think

20 it's common ground between us, Mr Crawford -- when you

21 came into the project, one of the significant elements

22 of the project was the overcladding of Grenfell Tower;

23 yes?

24 A. It was one of the elements, yes.

25 Q. Yes. So when you read this report and saw the

16

1 introduction and the description by Exova of what the
 2 refurbishment comprises, did it strike you as complete,
 3 or did it strike you as incomplete?
 4 A. I don't recall. I mean, I just read the report.
 5 I mean, I read the report from start to finish, and
 6 I wouldn't -- I don't think -- I wouldn't analyse it in
 7 that way, I wouldn't be marking it or saying --
 8 you know, I would just be -- because this was the third
 9 revision, this is where it was, I would just read it,
 10 assume it, look at fire strategy drawings, look at the
 11 project. I don't think I would look at in the terms
 12 you're sort of indicating.
 13 Q. So can we take it that you didn't think to yourself when
 14 you read this report, "Oh, they've missed out the
 15 overcladding in their description of the refurbishment"?
 16 A. But they didn't because it was later on.
 17 Q. Well --
 18 A. In the introduction, it's not there, but there are many
 19 things that are potentially not in there.
 20 Q. So is the answer to my question no?
 21 A. What was the question?
 22 Q. Yes, of course. Can we take it that you didn't think to
 23 yourself when you read this report, "They have missed
 24 out the overcladding in their description of the
 25 refurbishment"?

17

1 A. Well, I guess not, because I read it at the end.
 2 Q. Right.
 3 Maybe you don't remember, but did you have
 4 a discussion with Mr Sounes about the precise scope of
 5 what Exova were asked to do?
 6 A. I don't recall.
 7 Q. What about a conversation with Mr Ashton? Did you have
 8 a discussion with him about the precise scope of what
 9 Exova were asked to do?
 10 A. I don't recall.
 11 Q. Do you remember discussing with either of those two
 12 gentlemen where Exova had got to in Exova's assessment
 13 of the issues pertaining to external fire spread at the
 14 time of your handover?
 15 A. I would have understood it as per the line at the end of
 16 the report.
 17 Q. We will come back to the end of the report in a moment,
 18 because I know you keep referring to it and we will look
 19 at it.
 20 A. I suppose what I'm trying to say is at this point, when
 21 I took over the project, I would have had
 22 an introduction, I would have been concerned with
 23 certain things. The things I would have been concerned
 24 with were essentially M1 and M5 issues, because,
 25 for example, I knew some changes were happening at the

18

1 lower levels. The lower levels from a fire strategy
 2 perspective were much more complex, in my view, and
 3 I would have been aware of those and focusing on those.
 4 Then I would have read the whole report. I would have
 5 read the whole report in the context that it was the
 6 third version of the report, and that's where it was at
 7 the point in time. I wouldn't be going back and
 8 analysing it from the perspective of completeness of
 9 brief as you would at the start of a project.
 10 Q. Right. You mentioned M1 and M5. What are they?
 11 A. Sorry, B1 and B5.
 12 Q. I see.
 13 Do you remember ever discussing with Mr Sounes or
 14 indeed Mr Ashton where it had got to in its assessment
 15 of issues pertaining to external fire spread?
 16 A. I'm sorry to say this, but, again, my understanding was
 17 what it said in the document, which was at the end of
 18 the document, the statement at the end of the document.
 19 Q. All right. We will look at that.
 20 If you could turn the page to the next page
 21 {EX000001106/4}, please, at paragraph 2.1(d). It's on
 22 the screen now. Section 2 is headed "Statutory
 23 Considerations", and 2.1, "The Building Regulations
 24 2010", and then you can see that the five requirements
 25 of schedule 1 are set out. There is B1 at the top and

19

1 B5 at the bottom, and between them we have:
 2 "b) 82 (internal fire spread (linings));
 3 "c) B3 (internal fire spread (structure));
 4 "d) B4 (external fire spread) ..."
 5 Was it clear to you from reading that that the
 6 report was going to deal with each of those regulations
 7 or each of those requirements within schedule 1 so far
 8 as the refurbishment of the tower was concerned?
 9 (Pause)
 10 A. Yeah, my understanding would be that the report would
 11 deal with them in the terms in which they were
 12 applicable.
 13 Q. Can we look at page 9 {EX000001106/9}, please, and this
 14 should be paragraph 3.1.4, "Compliance with B4 (external
 15 fire spread)", do you see that?
 16 A. Yes.
 17 Q. It says:
 18 "It is considered that the proposed changes will
 19 have no adverse effect on the building in relation to
 20 external fire spread but this will be confirmed by an
 21 analysis in a future issue of this report."
 22 When you read this report, did you notice that
 23 paragraph?
 24 A. Erm ... I would have noticed it. I mean, if I read the
 25 report, I would have noticed it.

20

1 Q. Yes. Did you consider or do you remember considering
 2 Exova's progress in relation to its advice on compliance
 3 with B4, "External fire spread"? Did you consider how
 4 it would progress, what it says there?
 5 A. I'm not sure. I may have discussed with Bruce in the
 6 handover what his understanding was or where he saw the
 7 level of compliance at that point.
 8 Q. Right.
 9 Do you remember having a discussion with Mr Sounes
 10 on when Studio E expected to receive the future issue of
 11 this report?
 12 A. I don't recall having a specific --
 13 Q. Did Mr Sounes tell you to progress the next issue of
 14 this outline fire safety strategy with Exova once the
 15 cladding subcontractor had been engaged and further
 16 detailed design had commenced?
 17 A. I don't recall.
 18 Q. Did you ask Mr Sounes what documents Exova had in order
 19 that they could complete the analysis they indicated
 20 would be provided?
 21 A. I don't recall.
 22 Q. Did you yourself conduct any checks to see whether Exova
 23 had the documentation it needed to complete the analysis
 24 they said would be provided?
 25 A. I don't recall.

21

1 Q. Did you ask Mr Ashton whether there was anything Exova
 2 needed so that they could complete the analysis that
 3 they had indicated would be provided in a future issue
 4 of that --
 5 A. I don't recall.
 6 Q. Were you not in some way concerned that by August 2014,
 7 which was some ten months or so after issue 3, perhaps
 8 nine months after issue 3 of this report, that
 9 an analysis of the compliance of the overcladding scheme
 10 with regulation B4 of the Building Regulations had not
 11 at that stage been completed?
 12 A. My understanding was that the cladding is detailed in
 13 the employer's requirements and stage E in the tender
 14 set was compliant, and that the options were also
 15 compliant.
 16 Q. Where was that understanding from?
 17 A. I guess that would have been from conversations with
 18 Bruce, and also I would have expected any scheme at
 19 tender stage to be compliant relative to that stage.
 20 Q. So let's just try and be clear here. Are you saying
 21 that Mr Sounes told you that the cladding as detailed in
 22 the employer's requirements and the stage E tender was
 23 compliant with the Building Regulations?
 24 A. My understanding was that his understanding was that it
 25 was compliant.

22

1 Q. If that was so, Mr Crawford, do you know why, or do you
 2 remember asking yourself why it was that, as at
 3 November 2013, Exova were saying that they would confirm
 4 by an analysis in a future issue of this report whether
 5 the proposed changes would have any adverse effect on
 6 the building so far as external fire spread is
 7 concerned?
 8 A. It's possible, because there was a number of options and
 9 final decisions hadn't been made, particularly in
 10 relation to planning, what decisions came out of
 11 planning, that they wouldn't have done that final issue
 12 until, let's say, maybe they had more detail, I don't
 13 know, possibly.
 14 Q. Are you telling us that Mr Sounes had told you that,
 15 even though Exova had said in their 7 November 2013
 16 report that whether the proposed changes would have
 17 an adverse effect on the building in relation to
 18 external fire spread would need to be confirmed by
 19 an analysis in a future issue of the report, nonetheless
 20 there was no reason any longer to pursue such
 21 an analysis with Exova?
 22 A. I don't recall.
 23 Q. If Mr Sounes had told you that you needn't worry any
 24 more about compliance with B4, as indicated in this
 25 report, because he had already had the confirmation

23

1 needed, you would remember that, wouldn't you?
 2 A. Possibly.
 3 Q. But you don't?
 4 A. No.
 5 Q. On the assumption -- and bear with me on this -- that
 6 Exova had not, as at the summer -- July/August -- 2014,
 7 given any confirmation by an analysis, whether in
 8 a report or otherwise, that the proposed changes would
 9 have no adverse effect on the building so far as
 10 external fire spread was concerned -- on that
 11 assumption -- it's right, isn't it, that Exova still had
 12 significant work to do as at that date in respect of
 13 assessing the compliance of the overcladding scheme with
 14 the Building Regulations?
 15 A. Not necessarily. I mean, my understanding was that they
 16 had been kept abreast of the development of the project
 17 and the scheme, and therefore they knew exactly what was
 18 going on with the scheme and what the proposals were.
 19 So the fact that they -- I mean, they might leave that
 20 statement in the report, but it didn't mean -- it
 21 doesn't necessarily mean that what was proposed was in
 22 their view not compliant or compliant.
 23 Q. You say that that was your understanding.
 24 A. Yes.
 25 Q. Was that an understanding which you had from being told

24

1 that by somebody or was it an assumption that you made?
 2 A. I think this understanding I had from Bruce. I mean,
 3 I think Bruce was pretty clear that Exova knew what was
 4 going on and what was being proposed, and that's -- I'm
 5 sure that's the understanding I had.
 6 Q. Did -- I'm so sorry, do you want to finish your answer?
 7 I don't mean to interrupt you.
 8 A. That's it.
 9 Q. Okay.
 10 Let's just be very clear about this, Mr Crawford.
 11 Are you saying that Mr Sounes told you that Exova knew
 12 what was going on and -- let's just be clear about
 13 this -- were satisfied that the proposed changes to
 14 Grenfell Tower were compliant with the Building
 15 Regulations, specifically B4, "External fire spread"?
 16 A. Can you phrase that again, sorry? It was quite long.
 17 Q. Yes, I will.
 18 Are you saying that Mr Sounes told you that Exova
 19 were satisfied that the proposed changes to
 20 Grenfell Tower would have no adverse effect on the
 21 building so far as external fire spread was concerned?
 22 A. I think that was his belief. Whether -- how he
 23 communicated that to me, I can't specifically recall,
 24 but I do believe that was his belief.
 25 Q. Did you ever see a document that confirmed what you

25

1 understood to be his belief?
 2 A. No.
 3 Q. Did you ever ask him to get a document like that from
 4 Exova?
 5 A. I don't recall.
 6 Q. Given its importance, can you explain why you didn't ask
 7 Mr Sounes to get a document like that from Exova, or
 8 indeed seek one yourself?
 9 (Pause)
 10 A. Perhaps it was a feeling that -- well, I'm not entirely
 11 sure, but I think, as I stated earlier, my impression
 12 was that Bruce understood what had been proposed up to
 13 then in his eyes and Exova's eyes was compliant.
 14 Q. Do you agree that Exova's work at the tender stage -- so
 15 late 2013, Mr Crawford -- had not been brought to
 16 a state of completion so as to form a satisfactory basis
 17 on which to proceed with further design and
 18 specification of products?
 19 A. I couldn't comment on that, because I was not involved
 20 in that period of works. I think that's a comment --
 21 a question for Bruce.
 22 Q. A question for Bruce, all right. But would you agree
 23 that unless you knew whether or not for sure the
 24 cladding design was compliant with B4, you couldn't
 25 really make any progress yourself?

26

1 A. Well, as I stated, my understanding was from Bruce that
 2 he believed that it was compliant.
 3 Q. Right. But you never really interrogated Mr Sounes --
 4 perhaps that's a harsh word. You never scrutinised with
 5 Mr Sounes what the basis of his belief was? You just
 6 took it --
 7 A. Well, not in the way you are now, no.
 8 Q. No, but in any other way?
 9 A. I don't recall. I mean, generally when you have these
 10 conversations, they're fairly informal, and you look at
 11 the reports, you look at the drawings and you satisfy
 12 yourself that -- of what the issues are and where the
 13 project is at.
 14 Q. Can I ask you to look at --
 15 SIR MARTIN MOORE-BICK: All right, before we do that, can
 16 I just ask a question on the one that's on the screen at
 17 the moment.
 18 You can see, Mr Crawford, in paragraph 3.1.4 that
 19 Exova write:
 20 "It is considered that the proposed changes will
 21 have no adverse effect ..."
 22 Do you recall what you understood the proposed
 23 changes to refer to?
 24 A. I would understand that is the general proposition to
 25 overclad, and with all the options that we had provided

27

1 to date.
 2 SIR MARTIN MOORE-BICK: Even though, as far as we can see,
 3 there is no reference in this report to overcladding at
 4 all?
 5 (Pause)
 6 A. Yes, because my belief was that Bruce had kept them
 7 abreast of where the project was. I mean, there had
 8 been regular design team meetings.
 9 SIR MARTIN MOORE-BICK: This is a fairly formal document,
 10 isn't it?
 11 A. Yes.
 12 SIR MARTIN MOORE-BICK: If Exova had the overcladding in
 13 mind, would you not have expected them to have made
 14 a reference to it somewhere?
 15 A. Well, it does mention -- well, B4 is external
 16 fire spread, so that is external materials or cladding.
 17 SIR MARTIN MOORE-BICK: All right. Thank you.
 18 MR MILLETT: Can I ask you to go to {SEA00011473}, please,
 19 Mr Crawford.
 20 Correct me if I'm wrong, but I think these are your
 21 handwritten notes of a design team meeting of
 22 13 August 2014 --
 23 A. Yes.
 24 Q. -- at 10.00 am. You can see who was present. "SL",
 25 that's Simon Lawrence, isn't it?

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1 A. Yes.
 2 Q. Of Rydons. And then something else below it, "S", and
 3 it looks like, "PM Rydons, Harleys".
 4 A. That was probably Simon O'Connor.
 5 Q. Okay.
 6 A little bit below that, after "KL" and something
 7 and then "/NC" --
 8 A. That looks like "BS/NC".
 9 Q. Ah, okay. BS would be Bruce Sounes, I imagine?
 10 A. I'm guessing, yeah.
 11 Q. Then you see underneath that a line, and then it says
 12 "Cassette fix", and then underneath that, "Fire strategy
 13 not approved".
 14 Do you remember what that meant, "Fire strategy not
 15 approved"?
 16 A. Possibly with building control.
 17 Q. You say possibly building control; are you --
 18 A. Well, the reason I'm saying that is there were several
 19 iterations of the fire strategy plans that were
 20 commented on by building control and that went backwards
 21 and forwards a few times. In fact, it went backwards
 22 and forwards right until the end of the project, as
 23 I recall.
 24 Q. Right. To be clear, are you saying that the Exova
 25 issue 3, 7 November 2013, of the outline fire safety

29

1 strategy had gone to building control and they had not
 2 approved it?
 3 A. I think in the context of what's written there, I would
 4 have meant the fire strategy drawings. As I mentioned
 5 earlier, there were comments being made on them that
 6 were going backwards and forwards. I mean, the
 7 fire strategy drawings are pretty much inextricably
 8 linked with the document itself.
 9 Q. And we will see, perhaps later, what did go to building
 10 control. But can we be clear that it's not the
 11 fire strategy set out in the Exova report which we have
 12 just looked at from November 2013?
 13 A. Reading that now, I don't think it is.
 14 Q. While we're on it, do you know who had not approved the
 15 fire strategy, which individual?
 16 A. Well, Paul Hanson was looking at means of escape, B1 and
 17 B5 issues, so he was commenting generally on the
 18 fire strategy drawings in that respect.
 19 Q. Okay.
 20 Whose responsibility did you think at the time it
 21 was to get the fire strategy approved?
 22 A. Post-novation, Rydon, although we were doing it on their
 23 behalf.
 24 Q. Right.
 25 A. Or we -- doing part of it on their behalf.

30

1 Q. Right.
 2 Was there any discussion that you had with Rydon
 3 about how the fire strategy, as referred to there, would
 4 be approved?
 5 A. Well, they were fully aware of it because they were
 6 sitting in all the meetings. You notice Simon Lawrence
 7 at the top there. So, for example, Simon's very much
 8 aware of, let's say, the issues in relation to smoke
 9 vents and so on.
 10 Q. Were you told at this design team meeting whether the
 11 work on the fire strategy had been completed by Exova
 12 subject to approval?
 13 A. No.
 14 Q. Were you told whether Exova was expected to produce
 15 an updated or final outline fire safety strategy?
 16 A. Not that I recall.
 17 Q. Can I go back to your witness statement at
 18 {SEA00014275/61}.
 19 This is paragraph 188. You say there, under the
 20 heading "Exova" -- I'll take it from the top:
 21 "As above, Exova, the KCTMO's fire engineer,
 22 continued to provide advice on fire safety and fire
 23 engineering issues throughout the Project. I did know
 24 that Exova was not appointed by Rydon as at 19 September
 25 2014. It was possible that Exova remained appointed by

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1 KCTMO, due to the nature of some of the contemporaneous
 2 correspondence and Exova's lack of objection to
 3 assisting, which I have summarised below."
 4 Do you see that?
 5 A. Yes.
 6 Q. So is it right that you knew that Exova had not been
 7 appointed by Rydon?
 8 A. Yes. That reference to that email, Simon Lawrence
 9 brought it to my attention that they hadn't appointed
 10 them, yes.
 11 Q. Yes. We may come to that if we need to shortly.
 12 Is it right that you didn't know for sure, as of
 13 September 2014, whether Exova had been retained by the
 14 TMO?
 15 A. I knew that we had recommended repeatedly that a fire
 16 consultant was used at the start of the project, and
 17 also believe Bruce recommended they were used in the
 18 post-novation stage. I didn't know categorically
 19 whether they were employed by KCTMO, although the fact
 20 that they responded to all my queries to me suggested
 21 they were being employed by somebody. In some sense, it
 22 was none of my business who was paying them, so long as
 23 they were responding to my questions.
 24 Q. Was it not your job to find out who Exova had been
 25 retained by so that you knew who was responsible for

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1 them?

2 A. I would have only queried that if they had brought it to

3 my attention. For example, if they weren't being paid

4 or they weren't employed, you would normally expect the

5 consultant to say, "Well, I actually haven't been

6 appointed for this phase of works so I will need to get

7 back to you", and that would send an alarm bell,

8 perhaps, that well -- well, actually, in the context of

9 Simon Lawrence's email, you can -- if you pull that up,

10 you can see that he asked me to go back to him if they

11 aren't responding, but they were responding, so I had no

12 reason to believe that they weren't employed by KCTMO or

13 another entity.

14 Q. So does it come to this: you knew they weren't appointed

15 by Rydon so you assumed they had been appointed by --

16 A. Someone else.

17 Q. -- the TMO?

18 A. Yeah.

19 Q. I see.

20 Did you think to explore with the TMO or Exova what

21 the terms of their appointment were?

22 A. Frankly, that wouldn't have dawned on me. I mean,

23 I would expect -- I mean, the report's the report, the

24 continuation of the work is the continuation of the

25 work. If I was to make a query and they were to

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1 suddenly say, "Actually, we're not appointed to comment

2 on this aspect of work", then that would have flagged

3 something up to me.

4 Q. So I think we can agree at least this: you realised that

5 Exova weren't subcontracted to Studio E.

6 A. I knew that, yeah.

7 Q. So although they were, as you put it, the authority on

8 all things fire related in respect of the Grenfell Tower

9 project, that would depend on what they were asked to

10 do, wouldn't it?

11 A. Yes.

12 Q. And you had no control over that, because you, Studio E,

13 hadn't appointed them.

14 A. We hadn't appointed them, but we could ask any question

15 of them that we wanted.

16 Q. Well, you say that. It's right, isn't it, that if

17 in fact you had a query about anything specific, they

18 were only as accessible to you, Studio E, as their

19 relationship with the TMO permitted?

20 A. Correct, except I never remember being told when

21 querying anything that they couldn't respond to it.

22 Q. I see. So Exova essentially remained available to

23 Studio E really regardless of what questions you had for

24 them in relation to the project?

25 A. Yeah, and in the capacity that I would have expected.

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1 Q. And is this right: you understood that they were really

2 available to Studio E as a resource that you could use

3 on an as-and-when basis?

4 A. Yes.

5 Q. I see.

6 Did you ever raise any concerns regarding the nature

7 of Exova's appointment during the construction phase,

8 either with Mr Sounes or with Rydon?

9 A. I didn't see that as something for me to be concerned

10 with, unless I had an indication that something wasn't

11 right, which is what I kind of referred already.

12 Q. Can I ask you to look at your statement at

13 paragraph 197. This is on page 63 [SEA00014275/63].

14 Thank you. You say at the start of that paragraph --

15 and I should just point out, this is under the heading

16 "Revision B drawings":

17 "On 19 September 2014, Simon Lawrence (Rydon)

18 emailed me and said, regarding Exova, 'I know that they

19 provided information in the tender for KCTMO but I don't

20 know if they are still working for them. I know that we

21 haven't employed them. So if you are getting some free

22 advice then great otherwise we will need to look at

23 this .'"

24 Then you say:

25 "I replied on 22 September [saying] 'Thanks for the

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1 heads up' and again flagged the importance of getting

2 Building Control to agree the fire approach, to which

3 Simon Lawrence said we would chat about [sic] after the

4 design team meeting on 23 September 2014."

5 Now, I show you all of that. I have just one or two

6 questions about that there.

7 Do you remember, did you impress upon Mr Lawrence at

8 that time or at the design team meeting you referred to,

9 23 September, that Exova at that stage had not provided

10 any analysis of the compliance of the proposed

11 overcladding scheme with the Building Regulations as

12 they had promised to do or indicated they would do some

13 ten months earlier?

14 A. I don't recall doing that, but the line in the report

15 does state that the current proposal will have no

16 adverse effects.

17 Q. Subject to confirmation by way of an analysis in

18 a future issue of the report, is what it says, doesn't

19 it?

20 A. Yes.

21 Q. So my question again: did you impress upon Mr Lawrence

22 that Exova hadn't provided at that stage the promised

23 analysis?

24 A. I don't recall, no.

25 Q. Did you impress upon him that significant further work

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1 needed to be done in respect of the fire safety issues
 2 as they pertained to the proposed overcladding?
 3 A. I don't recall, no.
 4 Q. You told the Chairman that you understood that, even
 5 though the scope of the work identified by Exova in the
 6 introduction did not include overcladding, your
 7 understanding of their work is that it would do by
 8 reference to the paragraph we looked at and the
 9 reference to B4.
 10 A. Yeah.
 11 Q. So my question is: did you not tell Rydon, "Look, we
 12 need to push Exova to produce the promised analysis on
 13 external fire spread"?
 14 A. No, but I sent them details later.
 15 Q. Did you ever tell anybody or seek to speak to anybody at
 16 the TMO of the heads-up that you had received, as you
 17 put it, from Simon Lawrence?
 18 A. I'm not sure I had any contacts at the TMO -- direct
 19 contacts at the TMO.
 20 Q. No. In general terms, is that true post-novation, that
 21 you had no contact with the TMO?
 22 A. With the exception of Claire, I'm not aware of any.
 23 Q. Can we take it that you didn't take any steps yourself
 24 to tell the TMO that Exova had not provided a detailed
 25 fire strategy in respect of the proposed overcladding?

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1 A. No.
 2 Q. Given your understanding that Exova were, in your words,
 3 the authority on all things fire related, did you not
 4 seek to get to the bottom of what Exova's role actually
 5 was?
 6 A. In respect of?
 7 Q. Well, at least in respect of providing the analysis
 8 which would confirm their view that the proposed changes
 9 would not affect the risk of external fire spread?
 10 A. Sorry, can you ask the question again?
 11 Q. Yes.
 12 Given your understanding that Exova was the
 13 authority in respect of all things fire related, why
 14 didn't you seek to get to the bottom of what their role
 15 actually was, given that they had not produced the
 16 promised analysis that they said they would do?
 17 A. Well, I saw the consultation with Exova as ongoing. So,
 18 for example, as the details of the cladding became more
 19 apparent, I sent them to them.
 20 Q. Did you not at some point at least think it appropriate
 21 to tell Rydon or advise Rydon in pretty strong terms
 22 that a fire consultant, a specialist fire consultant,
 23 should be engaged, if not by Rydon then by Studio E, in
 24 order to get to the bottom of the external fire spread
 25 questions, given that Exova hadn't produced any?

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1 A. But I understood that Exova were engaged by someone
 2 else.
 3 Q. You understood that they were engaged by someone else,
 4 and therefore it was someone else's problem; is that it?
 5 A. No, no, no, no. It's only a problem to me so far -- if
 6 they didn't answer, for example, any queries that we
 7 had. If they were to, for example, turn round and say,
 8 "Oh, we can't respond to your question or your queries
 9 because we're not appointed to do this work", then
 10 I would have said, "Well, okay, there's something
 11 wrong".
 12 Q. I mean, at this point, really, you're getting, as
 13 Simon Lawrence has told you, free advice, weren't you,
 14 from Exova?
 15 A. No, he says, "I know that we haven't employed them",
 16 meaning Rydon.
 17 Q. Yes, "So if you, Studio E, are getting some free advice,
 18 then great, otherwise we will need to look at this".
 19 Let me put a question to you: did you think at that
 20 stage, September 2014, that Studio E, when it asked
 21 Exova for advice on an as-and-when basis, would get it
 22 for free?
 23 A. No. If you look at what he says, he actually says,
 24 "I don't know if they're still working for KCTMO". My
 25 assumption was that they were still working for the

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1 KCTMO. So it's not free advice.
 2 Q. But it's advice that you weren't paying for, wasn't it?
 3 A. But why would we? I mean, if you look at the diagrams
 4 at the start of my witness statement, section 10, there
 5 were a number of specialists and consultants that were
 6 contracted direct to -- or were client-side, and by that
 7 I mean KCTMO-side as opposed to Rydon-side.
 8 Q. You see, the advice that you were getting or could get
 9 from Exova would come to you.
 10 A. Yes.
 11 Q. But if you didn't actually know who they were employed
 12 by, would it follow that you wouldn't know the basis on
 13 which you were entitled to ask for that advice?
 14 A. Well, let me phrase it another way: if I was seeking
 15 advice and it was never -- there was never any, let's
 16 say -- if I asked for advice and it was given, then
 17 I had every reason to believe that I was getting all
 18 advice that I required; therefore, why would I question
 19 the scope of the advice they were being asked to give,
 20 because it was satisfying everything I was asking for.
 21 Q. How would you know whether TMO themselves knew that
 22 a future analysis had been promised by Exova in
 23 November 2013 and not, as at September 2014, yet
 24 delivered?
 25 A. Well, all of that was pre my involvement in the project,

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1 so --
 2 Q. Except that it wasn't, was it, because in September
 3 2014, the advice hadn't been delivered.
 4 My question again: how would you know whether TMO
 5 knew that?
 6 A. Well, I'm not a mind reader; I wouldn't.
 7 Q. Would you not think to check with Rydon that TMO had
 8 known that fact so that TMO could give the right
 9 instructions to Exova?
 10 A. In a certain sense, I didn't consider it any of my
 11 business who was employing who. I came into the
 12 project, I knew I had to get certain advice, I sought
 13 that advice, I got that advice.
 14 Q. Right.
 15 A. I mean, that's my position.
 16 MR MILLETT: Mr Chairman, we are going to move to
 17 a different topic and it's 11 o'clock. I wonder whether
 18 now may be a convenient moment for a break.
 19 SIR MARTIN MOORE-BICK: Yes. Would you like a break now,
 20 Mr Crawford?
 21 THE WITNESS: Yes, please.
 22 SIR MARTIN MOORE-BICK: Yes. We will stop now for
 23 ten minutes or so.
 24 Please don't talk to anyone about your evidence or
 25 anything related to it while you're out of the room. We

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1 will return at 11.10, please.
 2 Thank you very much, if you would like to go with
 3 the usher.
 4 (Pause)
 5 11.10, please.
 6 (11.00 am)
 7 (A short break)
 8 (11.10 am)
 9 SIR MARTIN MOORE-BICK: All right, Mr Crawford?
 10 THE WITNESS: Yes.
 11 SIR MARTIN MOORE-BICK: Good.
 12 Yes, Mr Millett.
 13 MR MILLETT: Mr Crawford, I'm now going to ask you some
 14 questions about the envelope insulation, if I may; that
 15 is the insulation applied within the new cavity which
 16 was formed by the rainscreen cladding system. All
 17 right?
 18 A. Mm-hm.
 19 Q. Now, I think we can agree that there were two insulating
 20 products ultimately used as envelope insulation material
 21 on Grenfell Tower: RS5000, Celotex, and Kingspan
 22 Kooltherm K15. Yes?
 23 A. We weren't aware of the Kingspan product being used
 24 until after --
 25 Q. We will come to that later on, but I think we can agree

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1 that they were used.
 2 A. Ultimately, yes.
 3 Q. As we have already discussed between us, when you came
 4 into the refurbishment project, Celotex FR5000 had been
 5 specified in the NBS spec --
 6 A. Yes.
 7 Q. -- as the thermal insulation to be used in the cladding
 8 system. Yes?
 9 A. (Witness nods).
 10 Q. If you nod, it won't go on the transcript.
 11 A. Oh, sorry, yes.
 12 Q. Can we go now back briefly to Approved Document B, which
 13 is {CLG00000224/96}, please. I just want to remind you
 14 of paragraph 12.7 of Approved Document B. We looked at
 15 it last week. It says, under the heading "Insulation
 16 Materials/Products":
 17 "In a building with a storey 18m or more above
 18 ground level any insulation product, filler material
 19 (not including gaskets, sealants and similar) etc used
 20 in the external wall construction should be of limited
 21 combustibility (see Appendix A). This restriction does
 22 not apply to masonry cavity wall construction which
 23 complies with Diagram 34 in Section 9."
 24 Now, it's right, isn't it, that Celotex FR5000 is
 25 a rigid polyurethane foam board or PIR product?

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1 A. Yes.
 2 Q. And PIR products are not generally regarded as materials
 3 of limited combustibility.
 4 A. They can be.
 5 Q. If you go to the BCA -- you say can be. They can be
 6 regarded as materials of limited combustibility; is that
 7 your experience?
 8 A. I believe they can be, yes.
 9 Q. Let me be clear, because I may have misled you by my
 10 question. I said polyurethane. In fact, PIR is --
 11 A. Polyisocyanurate, yes.
 12 Q. -- polyisocyanurate, isn't it? So your answer is still
 13 the same, isn't it, or is it?
 14 A. It is still the same.
 15 Q. Okay.
 16 You say they can be. What are the circumstances in
 17 your experience as at July/August 2014 in which
 18 a polyisocyanurate product could be a material of
 19 limited combustibility?
 20 A. Well, it's a plastic foam, essentially, and it's
 21 impregnated with a fire retardant to potentially make it
 22 compliant in that manner.
 23 Q. So are you saying that, as at the summer of 2014, you
 24 had come across PIR foam products for use as insulation
 25 that were of limited combustibility? Was that your

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1 experience?
 2 (Pause)
 3 A. I don't recall precisely.
 4 Q. No.
 5 A. I mean, I understand the definitions in table A7,
 6 for example.
 7 Q. Let's just look at those so we're clear, it's page 132
 8 {CLG00000224/132} of the same document on the screen,
 9 please. Here is table A7, "Use and definitions of
 10 materials of limited combustibility".
 11 Take a moment, if you would, please, Mr Crawford,
 12 just to look at that. Just to help you with it, because
 13 it's a document in a number of parts, the left-hand
 14 column is "References in AD B guidance to situations
 15 where such materials should be used", and there are nine
 16 instances of that. Then the definitions on the
 17 right-hand side of the page --
 18 A. So 8, for example, would apply in the definitions on the
 19 left.
 20 Q. Yes, and did you know at the time that in order to be
 21 a definition of -- as a material of limited
 22 combustibility, it either had to be classed in the
 23 European class under a or b --
 24 A. National class, yeah.
 25 Q. -- or any of the national classes set out in a, b or c

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1 or --
 2 A. Or d.
 3 Q. -- d, and d compares with c because it's about density.
 4 A. Yes.
 5 Q. So were you familiar at the time with table A7?
 6 A. I was aware of the table. I'm reluctant to use specific
 7 words like "familiar"; it kind of implies that you know
 8 everything specifically that's in it.
 9 Q. Right.
 10 Do you recall when Celotex RS5000 as opposed to
 11 FR5000 was specified for the Grenfell project in place
 12 of Celotex FR5000?
 13 A. Do I recall the period when it was specified?
 14 Q. Yes.
 15 A. Yes, it was forwarded to me by, I think, Ray, Harley,
 16 17/18 September, thereabouts, I think, 2014.
 17 Q. What makes you recall that so specifically?
 18 A. Because we were having a conversation -- I think they
 19 had raised their RFI in relation to the cavity barrier
 20 strategy.
 21 Q. Yes.
 22 A. And as with much -- many things in architecture, they're
 23 all interlinked. So, for example, how you may go about
 24 cavity barrier strategy, you have to consider the whole
 25 build-up of the wall, let's say, and Ray forwarded that

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1 information, I think in the belief that -- I can't
 2 remember whether I asked for it or not --
 3 Q. Okay. I see. All right. So we will come back to look
 4 at that chain of email correspondence in detail very
 5 soon.
 6 So you say it was Harley who specified RS5000 in
 7 place of FR5000.
 8 Do you know the circumstances in which that
 9 substitution took place?
 10 A. Meaning the reason for it?
 11 Q. Yes. Well, the reasons and the reasons surrounding it.
 12 A. No.
 13 Q. Was it not your business to know that?
 14 A. Well, I suppose, as the specialist subcontractor was
 15 proposing a product that on the face of it looked very
 16 similar to specified product.
 17 Q. On the face of what?
 18 A. Description.
 19 Q. I see. All right.
 20 A. Just to interject, it's worth bearing in mind, products
 21 were changing all the time, they were changing their
 22 names, their brands, their labelling. So, for example,
 23 RS could have been the same as FR, for example.
 24 Q. Did you at that time have a discussion with Ray Bailey
 25 or anybody else at Harley about why FR5000 was being

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1 replaced by RS5000?
 2 A. I don't recall, except that that's what they were
 3 proposing, and the nature of design and build gives them
 4 that entitlement to some extent.
 5 Q. So do we take it from that answer -- and I don't want to
 6 put words in your mouth, correct me if this is wrong --
 7 you simply took on trust from Harley that if they
 8 thought RS5000 was compliant, that was fine by you?
 9 A. I guess, yeah.
 10 Q. Yes? Really? Okay.
 11 Let's go back a question or two then to table A7.
 12 Were you aware or did you have any thoughts at the
 13 time about whether Celotex RS5000 was a material of
 14 limited combustibility, having regard to the matters in
 15 table A7, which you say you were familiar with?
 16 A. Well, the information, for example, on the technical
 17 sheet that Harley forwarded on the RS5000 product makes
 18 reference, for example, to BS 476, which
 19 cross-references with limited combustibility testing.
 20 Q. I note your answer. You say it cross-references with
 21 limited combustibility testing. Where do you see that
 22 on table A7?
 23 A. For example, d.
 24 Q. Yes. And that's, to be clear, 476-11; yes?
 25 A. Yeah, it does state 11.

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1 Q. 11. Do you know what testing to BS 476-11 involved?
 2 A. I understand the basic principles of BS 476 testing, but
 3 I wouldn't presume to assume that I knew anything
 4 specifically technical as that; therefore, I would refer
 5 it to the fire specialist, which I did.
 6 Q. Did you know that there was a difference between testing
 7 to BS 476-11 on the one hand and BS 476-6 and 7 on the
 8 other?
 9 A. I would always refer to fire specialist interpretation,
 10 particularly with this kind of information, because
 11 technically -- the use of the words, "thermocouples", in
 12 my opinion, is in many ways beyond that of an architect.
 13 Additionally, I would state -- I would point out there
 14 are over 100 BS references within part ADB2 alone. The
 15 idea that somehow you would have complete knowledge of
 16 all of them is absurd, in my view.
 17 Q. There is only one BS 476 reference under the national
 18 class for materials of limited combustibility, though,
 19 isn't there?
 20 A. Well, yes -- well, unless you did BS EN 13501 under
 21 European class.
 22 Q. I was talking about national class.
 23 A. In national class, yes.
 24 Q. So one wouldn't have to worry about all the other BSs,
 25 only that one, when one was looking to see whether

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1 a material was or was not a material of limited
 2 combustibility; do you agree with that?
 3 A. I would agree that you needed to have a sufficient
 4 knowledge of technical interpretation to be able to
 5 interpret the complexities that are implied in that.
 6 Q. Did you know or give consideration at the time to
 7 whether RS5000 was the same product or a different
 8 product from FR5000?
 9 A. I don't recall.
 10 Q. It's right, isn't it -- I think we can agree with each
 11 other -- that Celotex RS5000 was also a PIR product?
 12 A. Polyisocyanurate, yes.
 13 Q. Yes?
 14 A. Yes.
 15 Q. Do you happen to know what "FR" in FR5000 stands for?
 16 A. No.
 17 Q. Would it be surprising if I said "flat roof"?
 18 A. It would be, yes.
 19 Q. Right.
 20 Now, did you know that RS5000, like FR5000, did not
 21 meet the requirements for limited combustibility as set
 22 out in Approved Document B, table A7, that we have on
 23 the screen?
 24 A. I didn't know that categorically, no.
 25 Q. You didn't know it categorically; did you know it a bit?

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1 A. No. As I think I've stated, and in my witness
 2 statement, I referred to the fire specialist to check
 3 its compliance.
 4 Q. So just to be clear, would it follow from your answer
 5 that you didn't know that FR5000 should not have been
 6 used as an insulation product on Grenfell Tower unless
 7 either it was tested under a large-scale test under
 8 BS 8414 to the BR 135 criteria, or there was a desktop
 9 report, or a holistic fire engineered approach had been
 10 taken?
 11 A. My understanding of the FR product was that it had been
 12 proposed by Max Fordham originally, and from the
 13 conversations I had with Bruce, his understanding of it
 14 was that it was compliant. And then when I received the
 15 information from Exova, I sought to confirm to myself
 16 that -- from Harley, I sought to confirm to myself that
 17 it was compliant by checking it with the -- what
 18 I considered to be the higher fire authority, which was
 19 Exova.
 20 Q. Right. We will come back to that in due course.
 21 If we could look at your witness statement, please,
 22 at page 62 {SEA00014275/62} and look at paragraph 192,
 23 you refer to an email, and this is in the middle of
 24 an email string, and you say in response to the comment:
 25 "... Daniel Anketell-Jones (Design Manager at

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1 Harley), stated 'The insulation is class O... Therefore
 2 after reading the correspondence below; I believe that
 3 the fire barrier in these locations, will not be
 4 necessary. Can you confirm that this is acceptable?'.
 5 Again, I forwarded the comment to Exova, together with
 6 the datasheet for Celotex RS5000 dated August 2014 that
 7 Daniel had attached to his email."
 8 Now, if we can look at that, it's {SEA00011724}, as
 9 you have referred to it there at paragraph 192. Let's
 10 look at the second email in the chain. This is the
 11 email from Daniel Anketell-Jones to you, Mr Crawford, on
 12 18 September 2014 at 16.03, copied to various people,
 13 including Simon Lawrence at Rydon:
 14 "Neil.
 15 "Thank you for your response.
 16 "The insulation is class O."
 17 Et cetera, as you have quoted in your statement.
 18 Now, there is no reference in that email to the data
 19 sheet, is there?
 20 A. Not that I can see, no.
 21 Q. No. We will come back to that precise issue shortly.
 22 Can we look at the data sheet itself, which you
 23 didn't refer to but which your statement says you
 24 forwarded. It's {CEL00000411}, please.
 25 Is this the document that you were referring to in

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1 your statement?

2 A. Yes.

3 Q. Did you read it at the time --

4 A. Yes.

5 Q. -- of the email correspondence? Did you read it all?

6 A. I read enough to be convinced that I thought it was
7 appropriate to use.

8 Q. Right.

9 Now, if you look at the first page, which is the
10 page in front of us -- and we will come back to the
11 email chain later, let's just look at the documents --
12 it says at the third paragraph down:

13 "With Celotex RS5000 you are specifying
14 an insulation board ..."

15 Then in the second bullet point it says:

16 "Is the first PIR insulation board to successfully
17 test to BS 8414 ... meet the criteria set out in BR 135
18 and therefore is acceptable for use in buildings above
19 18 metres in height."

20 Then it says:

21 "Has Class 0 fire performance throughout the entire
22 product in accordance with BS 476."

23 Now, we know that Mr Anketell-Jones had said in his
24 email that it was class 0. My question is: what did
25 class 0 mean to you at the time?

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1 A. I understood class 0 in relation to diagram 40 and where
2 it should be applied in relation to diagram 40. I think
3 they've linked class 0 to BS 476. You can see that in
4 the third dot down.

5 Obviously, I mean, the way this information is
6 presented, there's repeated use of "applicable for use
7 in buildings over 18 metres". I mean, everything in
8 this document to me suggests that the product is
9 appropriate in rainscreen use -- that's its opening
10 line -- in buildings of more than 18 metres in height.
11 I had no reason to suspect that it wasn't, based on the
12 information that I read, and I forwarded it to Exova for
13 confirmation.

14 Q. So to answer my question, you say that you understood
15 class 0 in relation to diagram 40, and it should be
16 applied in relation to diagram 40?

17 A. But it also cross-references BS 476 there, which is also
18 referenced in limited combustibility testing.

19 Q. I see. It doesn't say which 476, though, does it?

20 A. Well, as I said, I don't consider myself a specialist in
21 that level of testing.

22 Q. Right.

23 A. I mean, if it says BS 476, then that's what I understood
24 by it.

25 Q. You refer to diagram 40. Did this thought go through

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1 your mind at the time: what had diagram 40 got to do
2 with the use of insulation?

3 A. Well, it talks about class 0 surfaces. We mentioned
4 before the internal surfaces.

5 Q. Right. What would class 0 in the context of
6 an insulation product to be used within a rainscreen
7 mean?

8 A. Well, it's a surface flame spread classification.

9 Q. Yes, and how would that be relevant to an insulation
10 product that you knew was being applied within the
11 rainscreen and not as the external surface?

12 A. Well, they use deliberately -- well, in my view, they
13 talk about class 0 through the whole product, which
14 I think is misleading. I can't actually see that here,
15 but it was in the first line.

16 Q. It does say it.

17 A. Where does it say it?

18 Q. Third bullet point down, "Has Class 0 fire performance
19 throughout the entire product" --

20 A. Oh, yes, "throughout the entire product", yes. Sorry,
21 yes.

22 Q. What does that mean to you?

23 A. It suggests to me that ... it's retarded and reduced
24 flame spread throughout the product.

25 Q. Right.

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1 A. I mean, to be blunt about it, we've obviously seen the
2 recent emails in terms of the internal correspondence
3 within Celotex, and clearly they sought to deceive, and
4 they calculatedly sought to deceive, based on the
5 understanding that an average architect would have, with
6 the way they have worded this document.

7 Q. Mr Crawford, I'm going to cut across this answer --

8 A. That's apparent by that reference to BS 476, and the way
9 it cross-references with limited combustibility. It's
10 deliberately misleading. It's masquerading horse meat
11 as a beef lasagne, and people bought it.

12 Q. Mr Crawford, I'm interested in your recollections as
13 they happened at the time and not in what you now say
14 about the behaviour of other people. Okay?

15 So what I want to know is what you thought on
16 reading this document at the time; do you understand?

17 A. Yeah.

18 Q. What I want to know is, when you read, as you say you
19 did, this data sheet, what you took from the third
20 bullet point down:

21 "Has Class 0 fire performance throughout the entire
22 product in accordance with BS 476."

23 Do you understand my question? At the time, what
24 did that mean to you?

25 A. All I can say is the totality of what was written there

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1 made me understand that this product was compliant in
 2 that use, and for me to verify that, knowing the
 3 technicalities that are involved in limited
 4 combustibility testing, was to confirm that with Exova,
 5 which I did.
 6 Q. This data sheet is not, is it, presenting this product
 7 as a product of limited combustibility in accordance
 8 with section --
 9 A. No, it's presenting it as a product suitable for
 10 buildings -- rainscreen in buildings above 18 metres.
 11 Q. Certainly that is what it says at the very top.
 12 A. No, it says it repeatedly through --
 13 Q. All right. Can you identify -- well, take it from me,
 14 because it's not from there, that nowhere in this
 15 document does it say that RS5000 is a product of limited
 16 combustibility.
 17 A. You're telling me that, so I'm taking your word on that.
 18 Q. Nowhere in this document does it say that it is
 19 a product of limited combustibility in accordance with
 20 section 12.7 and table A7 of Approved Document B.
 21 A. If you're telling me that, yes.
 22 Q. Well, do you recall ever reading it in there?
 23 A. Well, I've told you how I read it. I told you how
 24 I understood the document and how I checked the
 25 document.

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1 Q. So just so I've got your evidence clear on this, it's
 2 the class 0 fire performance throughout the entire
 3 product which to you meant that it was safe to use on
 4 buildings above 18 metres as an insulation product?
 5 A. No, no, it's the entire presentation material. I then
 6 sought to check that interpretation with Exova, which
 7 I did, and which I understood from what was fairly
 8 emphatic confirmation from Exova that it was applicable
 9 and that it could be used.
 10 Q. Let's look --
 11 A. Their understanding of how it was and how it could be
 12 used may have been different from mine. They may have
 13 had -- they work on hundreds of buildings. They may
 14 have had knowledge of BR 135 testing, for example, that
 15 led them to believe that it was applicable in this
 16 particular build-up.
 17 Q. But you don't know that, do you?
 18 A. No, but what I know is from the conversations I had with
 19 Exova, they were emphatic -- fairly emphatic about the
 20 fact that it was appropriate to use, and that's what
 21 they suggested to me. I mean, that was my understanding
 22 from the conversations I had with them. I asked them to
 23 put it in writing, they put it in writing, the contacts
 24 with the cavity barriers. On reflection, it is a tacit
 25 approval in writing, but from the conversations I had

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1 with them, I understood that it was appropriate to use.
 2 Q. Right.
 3 Now, looking at the data sheet, page 1, just above
 4 the bullet points, it says:
 5 "With Celotex RS5000 you are specifying
 6 an insulation board that ..."
 7 Then the second bullet point says:
 8 "Is the first PIR insulation board to successfully
 9 test to BS 8414 ... meet the criteria set out in BR 135
 10 and therefore is acceptable for use in buildings above
 11 18 metres in height."
 12 Now, do you remember seeing that?
 13 A. Yes.
 14 Q. Did it not occur to you at the time when you saw that
 15 that the reason why this material was acceptable for use
 16 in buildings above 18 metres in height was because it
 17 had, as it said, passed a BS 8414 test and met the
 18 BR 135 criteria?
 19 A. I think I've explained this several times now, there's
 20 multiple ways in which a product can be compliant,
 21 through various tests: the BS 476, the BS EN 13501, the
 22 BS 8414. I understand there's different routes which
 23 effectively prove that compliance. I don't think
 24 an architect has the technical ability to analyse all
 25 that. It's a highly specialist and technical set of

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1 information. Obviously doesn't help when it's
 2 misrepresented.
 3 So my first port of call was to send it to what
 4 I considered a higher fire authority, ie the fire
 5 specialist, and ask them to evaluate it.
 6 Q. You say it's misrepresented. Can we just be clear, what
 7 do you say was misrepresented?
 8 A. To me, the suggestion is that this product is
 9 appropriate for use in buildings over 18 metres, and
 10 everything about it suggests to me that it's -- that it
 11 can be used potentially under BR 135 or as limited
 12 combustibility.
 13 Q. You say "or as limited combustibility", does that tell
 14 us that you knew there was a difference?
 15 A. I think the "Class 0 performance throughout the entire
 16 product", when it is worded in those terms it's
 17 ambiguous, and when it relates it to BS 476 in those
 18 terms it's ambiguous.
 19 Q. Let's read on, then. If you go to page 2
 20 {CEL00000411/2} of this document, in the middle of the
 21 page it says "Physical Properties", and underneath that
 22 it says:
 23 "Fire propagation. BS 476: Part 6. Pass.
 24 "Surface spread of flame. BS 476: Part 7.
 25 Class 1."

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1 Do you remember looking at that detail when you saw
 2 this data sheet in September 2014?
 3 A. I don't specifically, no.
 4 Q. Had you done, you would have noticed, no doubt, that it
 5 did not say that it had passed a test under BS 476-11,
 6 which you told us earlier was the test for limited
 7 combustibility under table A7.
 8 A. Yeah. I think I would go back to my original point,
 9 which is that I would always forward this to a fire
 10 specialist, a higher authority, to get their
 11 understanding in the context of the whole build-up of
 12 the façade.
 13 Q. Then if we go to page 3 {CEL00000411/3} at the very top,
 14 "Certification":
 15 "Celotex RS5000 is a premium performance solution
 16 and is the first PIR board to successfully meet the
 17 performance criteria set out in BR 135 for rainscreen
 18 cladding systems."
 19 Then it sets out what the test was.
 20 Did you read that at the time, do you think?
 21 A. I don't recall.
 22 Q. Did you notice what the system tested was?
 23 A. I don't recall.
 24 Q. Did you notice the wording at the bottom:
 25 "The fire performance and classification report

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1 issued only relates to the components detailed above.
 2 Any changes to the components listed will need to be
 3 considered by the building designer."
 4 Did you read that at the time?
 5 A. I don't recall reading that.
 6 Q. Did you understand from this document that the only
 7 basis for Celotex's claim that RS5000 was suitable for
 8 use on buildings over 18 metres in height was that it
 9 had, as Celotex said, satisfied the BR 135 criteria by
 10 way of a full-scale BS 8414 test?
 11 A. No, I don't think I understood the product as being --
 12 as compliant only under -- necessarily compliant only
 13 under the BR 135 test. I understood that it could be
 14 compliant, and in order to check that compliance
 15 I forwarded it to the fire consultant.
 16 Q. So do we take it from that that the actual basis of
 17 Celotex RS5000 as suitable for use above 18 metres, as
 18 set out there -- namely, in accordance with the test
 19 identified -- was not something that you thought needed
 20 to be considered by the building designer, because you
 21 didn't check it yourself?
 22 A. Like I said before, I think the interpretation
 23 specifically of parts of Approved Document B are
 24 extremely difficult and I would forward them to a fire
 25 specialist, or at least seek fire specialist advice,

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1 which I did.
 2 Q. Just taking it in stages to see how far we get, do you
 3 accept that the configuration and the materials that
 4 were used in the BS 8414 test as set out in this data
 5 sheet as we can see on page 3 was not the same as that
 6 proposed and in fact used at Grenfell Tower, was it?
 7 A. No. It doesn't necessarily mean they wouldn't behave
 8 the same way, but no, they're not the same.
 9 Q. Therefore, it was a change to the components which would
 10 need to be considered by the building designer. Did
 11 that occur to you at the time, that because the system
 12 was different ...?
 13 A. If you're assuming a BR 135 test in relation to that --
 14 and, again, as I have pointed out, Exova have authority
 15 in fire and have a massive number of desktop studies and
 16 tests which they can call upon, and I suspect that is
 17 what they used to inform the fact that they believed it
 18 was compliant.
 19 Q. When you read this document, did you think to yourself,
 20 "It is compliant and I can use it above 18 metres in
 21 height", or did you think to yourself, "I'm not sure,
 22 I had better ask Exova"?
 23 A. I wouldn't assume anything in part B, in many ways.
 24 I think from what I saw in the literature on the front
 25 of the product, I did pretty much assume that it was

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1 appropriate for use, but I sought to check that with the
 2 fire specialist.
 3 Q. The basis of your what you call pretty much assume, your
 4 assumption, just so that I'm clear, is what, the
 5 reference to class 0? Is that it?
 6 A. It's as set out in my witness statement. It's all those
 7 statements combined.
 8 Q. I see.
 9 Can I ask you to be shown a document which you may
 10 not have seen, and if you haven't we'll think again.
 11 Look at {CEL00000012}, please.
 12 Now, this is something called a "Rainscreen cladding
 13 compliance guide when specifying Celotex RS5000 in
 14 buildings above 18 metres", and it's dated, although
 15 I don't think you can see it on the screen, August 2014.
 16 At the time of your coming into the project, or
 17 indeed at any time, did you see this document?
 18 A. No.
 19 Q. Right.
 20 Now, in September 2014, on 2 September, you I think
 21 attended a design team meeting, design team meeting
 22 number 2; do you remember that?
 23 A. Yes.
 24 Q. Okay, I'll show you a document. If you can go, please,
 25 to {SEA00011581}, these are the minutes of the meeting.

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1 You can see that it was held on site at 10.00 am on that
2 day, 2 September 2014. Mr Lawrence was there,
3 Mr O'Connor was there from Rydon, and you were there as
4 the project architect, Studio E; do you see that?

5 A. Yes.

6 Q. Mr Anketell-Jones and Kevin Lamb were there from Harley
7 as well.

8 Now, can I ask you, please, to go to item 3.62 on
9 page 4 {SEA00011581/4}. It's under the heading against
10 3.60 "Cladding (insulation, fixings, panels, etc)", and
11 3.62 discusses U-values. Do you see that?

12 A. Yes.

13 Q. It says:

14 "U-values were discussed with SL asking how the
15 figures in the spec, were arrived at and whether they
16 need to be rechecked from an M&E and insulation point of
17 view. Is the insulation thickness shown on Architect
18 drawings, correct. DAJ confirmed that he had checked
19 them but with the assumption that RML were fitting
20 further insulation internally. SL didn't believe this
21 was part of the spec. All parties agreed to check their
22 documents."

23 Do you see that?

24 A. Yes.

25 Q. Then there is a PMN, which I think is a post-meeting

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1 note, which says:

2 "... Max Fordham tender U-Value document was shared
3 to team via email. External wall construction was
4 checked against all tender information and all
5 information shared."

6 Do you know or do you remember what figures in the
7 spec exactly were checked?

8 A. No.

9 Q. Do you know why Mr Lawrence wanted to recheck the
10 U-values?

11 A. I don't recall.

12 Q. Do you know what had changed, perhaps, that made him do
13 that?

14 A. I don't recall.

15 Q. Did you review the Studio E tender information in
16 respect of the insulation at the time?

17 A. I can't recall. I can't recall whether this went back
18 to Max Fordham as a discussion or not, I just -- without
19 seeing the associated correspondence.

20 Q. Do you remember, did you have any discussion with
21 Mr Sounes about how the U-value was decided upon?

22 A. I knew it had been derived from the original in the
23 original Max Fordham report.

24 Q. It had been derived from that? Did you have
25 a discussion about it?

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1 A. I knew there was a U-value target and there had been
2 a proposal to achieve that U-value target. I don't
3 recall any specific detail, if that's what you're
4 asking.

5 Q. Do you remember whether you checked the U-values with
6 Mr McQuatt or anybody else at Max Fordham?

7 A. I can't recall at this particular instant, to be honest.

8 Q. Did you look back through the records you had, like
9 emails, to understand how the target U-value had been
10 decided?

11 A. I may have done, I just ...

12 Q. Do you remember any discussion historically in the
13 project, before you came on the scene, of the use of
14 mineral wool as an insulation product?

15 A. No.

16 Q. So you can't help us as to why it was that mineral wool
17 had been discounted for use as insulation?

18 A. I understood that the thicknesses were impractical to
19 achieve that U-value, the bracketry ...

20 Q. Who did you understand that from?

21 A. I think Bruce.

22 Q. I see.

23 Now, can I take you on a little to {SEA00009561}.
24 This is an email of 1 November 2013, and it's an email
25 from Tom Ashton at Curtins to Artelia and Bruce Sounes,

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1 and I don't think it came to you, but it says:

2 "Dear All,

3 "Please find our structural specifications
4 attached."

5 I suspect one of the reasons it didn't come to you
6 is you weren't involved in the Grenfell project at that
7 time.

8 Now, I'm assuming, Mr Crawford, unless you tell me
9 otherwise, that you didn't see this email at the time.

10 A. No, this is a year and a half before --

11 Q. Exactly, but let's look and see what the structural
12 specifications were. It's one of the attachments to the
13 email, and it's at TMO10002249. In the email, it's the
14 one that's entitled LO1212-SPEC-001, it's the last
15 attachment referred to.

16 There it is. It's Curtins' spec of 1 March 2013 for
17 the design, supply and application of overcladding
18 systems to Grenfell Tower.

19 If you look at this, do you remember ever reading
20 this document once you had taken over from Bruce Sounes?

21 A. I don't recall seeing this document.

22 Q. You don't recall ever seeing it; is that right?

23 A. I don't recall seeing it, no.

24 Q. Okay.

25 Did you know -- and I'll ask the question in

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1 a general way -- that this specification had at least
 2 recommended that the cladding system should comply fully
 3 with the recommendations of the BRE document, "Fire
 4 performance of external thermal insulation for walls of
 5 multistorey buildings" dated 2003?
 6 A. I don't recall seeing the document, so I wouldn't --
 7 Q. You wouldn't know.
 8 Did you ever have a discussion with Mr Sounes about
 9 whether the system as specified in the NBS specification
 10 was compliant with BR 135?
 11 A. Specifically with 135, no.
 12 Q. Yes.
 13 A. No.
 14 Q. Would you agree with me -- and this may be a hypothesis
 15 because you didn't read the document, so putting it in
 16 that context, Mr Crawford -- that if, under this
 17 structural specification that Harley were working to, if
 18 they were required to work to it, that's the case and
 19 the cladding system was to comply fully with the
 20 recommendations of BR 135 of 2003, then the
 21 recommendations were part of the performance criteria
 22 for the system?
 23 A. This I can't answer. It's a hypothetical question.
 24 Q. Okay, you won't answer. All right. Or can't answer.
 25 Just generally, then, before I leave that, did you

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1 take any steps yourself to ensure at any time that
 2 Harley's drawings were compliant with the
 3 recommendations under BR 135, 2003 or indeed 2013, which
 4 was the third edition?
 5 A. Not that I recall, no.
 6 MR MILLETT: Okay.
 7 I'm now going to turn to a different topic.
 8 Mr Chairman, we're a bit early for the next break,
 9 but the next topic is quite long, so I'm entirely in
 10 your hands. I'm very happy to start it.
 11 SIR MARTIN MOORE-BICK: When you say quite long, what are
 12 you talking?
 13 MR MILLETT: It's likely to take us up until the lunch break
 14 and possibly beyond.
 15 SIR MARTIN MOORE-BICK: Perhaps you would rather have
 16 a break while you have the chance, Mr Crawford.
 17 THE WITNESS: Yes.
 18 SIR MARTIN MOORE-BICK: I think that would be sensible.
 19 All right, we will rise for ten minutes. If you go
 20 with the usher, please, we will come back at 12.05,
 21 thank you.
 22 (Pause)
 23 12.05, please.
 24 (11.55 am)
 25 (A short break)

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1 (12.05 pm)
 2 SIR MARTIN MOORE-BICK: All right, Mr Crawford?
 3 THE WITNESS: Yes.
 4 SIR MARTIN MOORE-BICK: Good.
 5 Thank you, Mr Millett.
 6 MR MILLETT: Mr Chairman.
 7 Mr Crawford, I'm going to ask you some questions now
 8 about the exchange of emails on 17 and 18 September 2014
 9 following the request for information from Harley to
 10 Rydon.
 11 If we can start, please, with {SEA00011730/4}.
 12 There you have an email from Daniel Anketell-Jones to
 13 Simon Lawrence and Simon O'Connor of Rydon, copied to
 14 you and Mr Sounes -- well, actually to both of you, and
 15 copied to Kevin Lamb. The subject is "Grenfell Tower
 16 Cavity Fire barriers":
 17 "Simon,
 18 "Please find attached RFI001 which relates to the
 19 requirement of firebreaks. This may be something that
 20 has already been decided, or may need confirmation from
 21 the local fire officer, as the opinion tends to vary."
 22 Do you see that?
 23 A. Yes.
 24 Q. Then the request itself, which is attached, is at
 25 {HAR00003616}, please.

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1 You can see it there, request for information form.
 2 The date on the right-hand side, 17 September 2014.
 3 It's from Daniel Anketell-Jones at Harley to
 4 Simon Lawrence at Rydon. Date answer required:
 5 26 September 2014. Query:
 6 "Please may you confirm the required extent of the
 7 horizontal firebreaks within the cladding areas?"
 8 Then the suggested solution:
 9 "We believe that they will be required at every
 10 floor level on the vertical columns, but not in the area
 11 of cladding between windows. This is because there is
 12 no 'chimney' effect here, and therefore the cladding
 13 will not add to the spread of fire."
 14 First, because we have seen that you received this
 15 document, my question is: why did you think at the time
 16 that Harley was sending you this request as well as
 17 Rydon, given your post-novation role as you saw it?
 18 A. Well, if you look at the original email -- if you bring
 19 that back up on the screen.
 20 Q. Yes, it's {SEA00011730/4}.
 21 A. Where they mention "may need confirmation from the local
 22 fire officer, as the opinion tends to vary", meaning
 23 building control. So I saw this as assisting in
 24 co-ordinating building control.
 25 Q. Why did that occur to you as something for Studio E as

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1 opposed to Rydon alone?
 2 A. Well, we obviously had a cavity barrier strategy at
 3 stage E within the employer's requirements, and what he
 4 is suggesting is contradictory to that.
 5 Q. So the question then is -- and I want your recollection
 6 of how you saw this at the time, Mr Crawford -- was the
 7 RFI, that was the question, a question which fell within
 8 the scope of what you saw as commenting on design
 9 intent?
 10 (Pause)
 11 A. Or rather manifests issues, yes.
 12 Q. "Or rather manifests issues", I'm not sure I'm
 13 understanding that qualification.
 14 A. Okay, the way I saw this is we had a fire strategy --
 15 a cavity barrier strategy at stage E in employer's
 16 requirements. They were proposing a different strategy,
 17 so it was perfectly logical for them to quantify that
 18 against our strategy, particularly when it related to
 19 co-ordination of building control submission, for which
 20 it's part of our responsibility, which is what's
 21 inferred by confirmation from a local fire officer.
 22 Q. So just to be clear about this, this question, am
 23 I right in saying, fell outside the scope of what you
 24 saw as commentary on design intent?
 25 A. I know where you're coming from and --

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1 Q. Never mind about where I'm coming from. Did you or did
 2 you not see it as falling within the scope --
 3 A. It's not architectural intent. Is it architectural
 4 intent? Borderline.
 5 Q. Borderline?
 6 A. Yeah.
 7 Q. And given --
 8 A. The fact they've -- well, look, I think I've said it
 9 already, they came to us for specific information in
 10 an RFI in relation to the clarification against our
 11 original scheme. It would be unreasonable not to answer
 12 it -- at least attempt to answer it.
 13 Q. Well, Harley were already on board at this point,
 14 weren't they --
 15 A. Yes.
 16 Q. -- as the specialist subcontracting designer for the
 17 cladding?
 18 A. Yes.
 19 Q. So why didn't you go back, as a recipient of this email,
 20 to Daniel Anketell-Jones and say, "This is a matter for
 21 you to work out with Rydon and not a matter for us
 22 because it does not fall within the scope of
 23 architectural intent or design intent"?
 24 A. Yeah, but there's an issue of co-ordinating building
 25 control and ultimately seeking to get building control

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1 sign-off, so -- and -- well, yeah, that's what I would
 2 say, I guess.
 3 Q. Okay. Well, we see your response, or rather your next
 4 move. If you go up the page, page 4, we can see that
 5 under cover of an email on 18 September at 11.08, you
 6 send the email that you have received on to Terry Ashton
 7 at Exova with the RFI; yes?
 8 A. Yes.
 9 Q. And you copy in Simon Lawrence and Simon O'Connor, and
 10 you say:
 11 "I am working on the Grenfell Tower regeneration
 12 project from the Studio E end. The following RFI has
 13 come in relating to horizontal fire breaks within the
 14 cladding areas.
 15 "Can you comment on the RFI attached and whether you
 16 believe this interpretation in relation to stack effect
 17 is correct?"
 18 Now, the first point is that's not, is it, the
 19 co-ordination of answers with building control; you're
 20 essentially passing him on the question you have been
 21 asked by Daniel Anketell-Jones.
 22 A. Yes, but ultimately his original question related to --
 23 I mean, he raised the point that different building
 24 controls have different -- or he didn't use the word
 25 "building control", I can't remember what he used, but

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1 that's what he's referring to. Building control fire
 2 officers have different interpretations of the
 3 requirements of cavity barriers. Therefore, it was
 4 related to building control ultimately.
 5 Q. You then move up the page, if we can, please, to page 3
 6 {SEA00011730/3} of that email chain -- I'm sorry to do
 7 this in reverse order, but that's how these things
 8 are -- and Mr Ashton replies at 11.30 that morning,
 9 18 September 2013, and he says:
 10 "Neil
 11 "I've never seen details of what you're doing to the
 12 external walls. Do you have any
 13 cross-sections/elevations?"
 14 Now, let's just take this slowly.
 15 At this stage, Mr Crawford, you had read issue 3 of
 16 Exova's outline fire safety strategy, as you have told
 17 us before.
 18 A. Yes.
 19 Q. And you had read in that document in relation to B4 that
 20 there were no adverse effects but that would be
 21 confirmed in a future analysis.
 22 A. Yes.
 23 Q. Mr Ashton's response that he had never seen details of
 24 what Studio E had designed --
 25 A. No, no, that's not what he said. He says, "I have not

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1 seen details ". It doesn't mean that he didn't know what
2 was happening in the external walls.

3 Q. You cut across my question.

4 A. Sorry.

5 Q. Let me try it again.

6 Mr Ashton responds and he says:

7 "I've never seen details of what you're doing to the
8 external walls."

9 Did that come as something of a surprise to you at
10 the time?

11 A. Well, my understanding from discussions with Bruce is
12 that Exova were fully aware of how the scheme had
13 developed, including the external wall build-ups.

14 Q. Well, let's just go back a little bit to the evidence
15 that you gave us this morning, Mr Crawford, about that
16 paragraph which deals with requirement B4 in the
17 Building Regulations within the Exova fire safety
18 strategy.

19 You told us that you thought that Mr Sounes had
20 believed that he had been told by Exova that the
21 strategy was compliant, that the design was compliant.

22 Now, when Mr Ashton tells you in September 2014 that
23 he has never seen details of what you're doing to the
24 external walls, did you not stop and think and ask
25 yourself how it could be that Mr Sounes had previously

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1 thought -- if that is correct -- that he had been told
2 by Exova that the external wall construction was
3 compliant?

4 A. No, because he says, "I've never seen details ". Harley
5 were doing the details, they were doing the 1:5 details.
6 We hadn't done 1:5 details in, for example, the
7 employer's requirements set. So they understood the
8 concept, they understood it in a broad-brush stroke,
9 let's say, sense of what was being installed. But what
10 he is saying is, "I've never seen details".
11 I understand "details" means specific details, as in the
12 specialist subcontractor's details.

13 Q. Yes, so did Mr Ashton's response not undermine entirely
14 what you had read in the outline fire safety strategy
15 from 2013?

16 A. No, because that's an outline fire strategy; it's not
17 a detailed fire strategy.

18 Q. Did it not undermine the belief that you had that
19 Mr Sounes had been told by Exova that the designs at
20 that stage were compliant?

21 A. No.

22 Q. Did it give you cause to consider that Exova had not
23 in fact at that stage considered at all the impact of
24 the overcladding scheme and its compliance with
25 requirement B4?

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1 A. Sorry, can you rephrase that or repeat it, sorry?

2 Q. Yes.

3 Did Mr Ashton's response to your question not give
4 you cause to consider that Exova had not in fact
5 considered at all the impact of the overcladding scheme
6 and its compliance with requirement B4 of the Building
7 Regulations?

8 A. I don't think it necessarily did, no.

9 Q. If Mr Ashton had not seen the details of what you were
10 doing to the external walls, how could he possibly give
11 any reliable advice about whether the overcladding
12 scheme did or didn't comply with requirement B4 of the
13 Building Regulations?

14 A. But I've just explained that. He was taken through the
15 scheme. As the scheme developed, my understanding was
16 the scheme was developed up to tender stage, he did
17 understand the concept of what was going to the wall.
18 What he is saying here is, "I've never seen details".
19 The key word is "details".

20 Q. Did you take up Mr Ashton's response with Mr Sounes?

21 A. I don't recall. Possibly.

22 Q. Would you not have expected Studio E and yourself, as
23 project architect -- and I know you don't like the
24 term -- but as lead consultant and lead designer, to
25 have sent the details that we see there referred to by

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1 Mr Ashton to Exova at an earlier stage so that they
2 could advise on whether the various elements of the
3 cladding design and the system did comply with Approved
4 Document B?

5 A. Well, I think I've already explained to you what my
6 understanding was, and the information that was,
7 for example, worked up to and in the stage E report
8 wouldn't have included and didn't include that level of
9 detail. It didn't include 1:5 details, for example.

10 Q. Did it not occur to you at the time to go back to
11 Mr Ashton and ask him a question such as, "Well, hold on
12 a moment, I need to understand what details you have
13 seen and what details you haven't seen in relation to
14 the external walls"? Did that occur to you?

15 A. Well, with all due respect, I don't know exactly what he
16 had or hadn't seen or had or hadn't discussed with
17 Bruce, but my understanding was that Exova, whether
18 Terry individually or as a totality, had
19 an understanding of where the project was at that point
20 in time. Now, when he made this comment, I then send
21 him the details, which had quite recently just become
22 available from Harley.

23 Q. Well, all right, let's look at that. If you go on to
24 page 3 {SEA00011730/3}, up the page, you can see your
25 answer, Neil Crawford to Terry Ashton, 18 September at

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1 12.18:
 2 "Hi Terry
 3 "Please see attached our sections and the initial
 4 drawings set we have had from Harleys. The initial
 5 drawings from Harleys are fairly limited but they
 6 attempt to establish the basic approach.
 7 "Regards
 8 "Neil."
 9 Now, let's just look at the drawings that you sent
 10 to Mr Ashton. I think you attach the Harley initial
 11 drawing set, don't you?
 12 A. Yes.
 13 Q. You refer to it in your statement, but let's look at it.
 14 It's {SEA00011714}, please.
 15 Now, we can scroll through these quickly, just to --
 16 or not quickly, but gradually perhaps, just to identify
 17 what it is you sent. I'll just let you do that.
 18 If, Mr Operator, you could please scroll down
 19 through the drawings so that the witness can see what it
 20 is he sent.
 21 (Pause)
 22 So that's page 3 {SEA00011714/3}, window head, upper
 23 levels.
 24 On page 4 {SEA00011714/4} we've got window jamb.
 25 That's upside-down, but it probably doesn't matter.

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1 Then page 5 {SEA00011714/5}, the vents.
 2 Page 6 {SEA00011714/6} we have got column front.
 3 Page 7 {SEA00011714/7} is jamb joint, upper levels.
 4 Page 8 {SEA00011714/8} is column joint.
 5 Page 9 {SEA00011714/9} is window cill, lower levels.
 6 Page 10 {SEA00011714/10} is window head, lower
 7 levels.
 8 Page 11 {SEA00011714/11} is jamb joint, lower
 9 levels.
 10 Just to remind you of what it is you sent.
 11 Those were -- I'm summarising them -- window head,
 12 cill and jam sections, plus typical bay, west elevation.
 13 Now, we can look at any one of these if you would
 14 like to, but am I right in thinking that no materials
 15 are identified, either in terms of panel or insulation
 16 type?
 17 A. Not within this set, no.
 18 Q. And there are no details of the proposed cavity barrier
 19 locations either, are there?
 20 A. No.
 21 Q. And, indeed, parts of the window assembly are
 22 unlabelled, aren't they?
 23 A. That's correct.
 24 Q. So if you go back to your email to Mr Ashton, just have
 25 a look at it, {SEA00011730/3}, yours at 12.18, you the

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1 second line, you describe these as:
 2 "... fairly limited but they attempt to establish
 3 the basic approach."
 4 And that's right, isn't it? That's all they were.
 5 A. Yes.
 6 Q. You then sent, just following the facts through, some
 7 Studio E section drawings, and the first one I want to
 8 show you is {SEA00011711}, for the offline version,
 9 please. We want that for the offline version. We may
 10 just have to blow it up a little bit.
 11 This is entitled "Detail section sheet 1". I can't
 12 see it on the screen. If you go to the bottom. You
 13 will have to read it, I am afraid, in portrait, although
 14 it's a landscape document. You can see at the bottom
 15 left-hand corner -- if you turn your head, you can see
 16 it says in the third box from the left, "Detail section
 17 sheet 1". Do you see that?
 18 A. Mm-hm.
 19 Q. It's dated 26 September 2013; yes?
 20 A. Yes.
 21 Q. On the left-hand side of the drawing, the first and the
 22 third labels down from the top under the big "01", next
 23 to the "H92 123", you can see that it says:
 24 "Zinc composite rainscreen panel and framing system
 25 to cills."

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1 Do you see that?
 2 A. Yes.
 3 Q. In fact, it's right that by this time -- this is
 4 mid-September 2014 -- aluminium composite panels had
 5 been selected, hadn't they?
 6 A. I believe that had been proposed, yes.
 7 Q. Can you explain why you are sending Mr Ashton drawings
 8 which show zinc composite cladding when in fact
 9 aluminium composite panels had by now been selected?
 10 A. Well, that's not actually quite true. If you look down
 11 at the bottom of that, you can see it says "Aluminium
 12 composite TBC". So it's true the drawing shows both
 13 zinc and aluminium composite, although they're both
 14 national class 0.
 15 Q. I wasn't asking you about national class 0, Mr Crawford,
 16 I just want to understand why it is that at H92, where
 17 I have identified, it says zinc composite rainscreen
 18 panel. Can you explain why it still said that, given
 19 that ACM had been selected?
 20 A. I think there was a -- Bruce was hoping that the zinc
 21 would perhaps stay and certainly there were issues
 22 relating to discharge of the final planning, or final
 23 planning decisions were still being made in the
 24 background.
 25 Q. Right. Okay. Well, let's --

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1 A. So, in essence, what I'm saying is that drawing does
2 show two different types of cladding. What I'm saying
3 to you is materially my understanding is there is
4 effectively no difference in terms of performance.
5 Q. Right.
6 We know that there was some element of aluminium on
7 the first four floors, Mr Crawford, just to be clear
8 about that.
9 A. Yeah.
10 Q. But at H92, at 123, which is that part of the NBS spec
11 which refers to the rainscreen higher up the building,
12 it still says zinc, and I would just like to try and
13 understand why you were sending Mr Ashton at this stage
14 drawings which said zinc when it was ACM.
15 A. Yes, but it also says "H92 125", halfway up, "PPC
16 aluminium (composite ...)".
17 Q. Yes, Mr Crawford, we have been round this before, and
18 that may be the lower levels, but higher up it wasn't
19 going to be --
20 A. No, no, it's not the lower levels, it's still within the
21 main body of the upper -- when you say lower levels, do
22 you mean the top 20 levels or do you mean a level within
23 that level?
24 Q. H92 125, which is what you're focussing on where it
25 says aluminium, do you remember that the NBS spec refers

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1 to "rainscreen cladding first four floors elevation and
2 internal envelope of main entrance canopy and canopies
3 in general"? That's 125. 123 is not.
4 A. Can you scroll this section up?
5 Q. Certainly.
6 (Pause)
7 A. Okay, so, yeah, if you scroll back up to the top again.
8 (Pause)
9 Yes, so this is with -- yeah, it's walkway +1.
10 Sorry, I see what you're saying, yes.
11 Q. So can you explain, just to ask the question one more
12 time, why it was that under H92, which referred to
13 part 123 or paragraph 123 of the NBS spec, which is the
14 rainscreen cladding higher up in the tower to the
15 spandrel panels, it still referred to zinc composite
16 when ACM had by now been selected?
17 A. Well, for the reasons I think I mentioned slightly
18 earlier, but I know Bruce was keen to try and keep the
19 zinc, and obviously there were ongoing planning issues.
20 Zinc CM, ACM, interchangeable in terms of performance.
21 But, yes, it --
22 Q. It was out of date, wasn't it?
23 A. Well, not if you consider it is part -- say, taken from
24 the employer's requirements set of drawings, which would
25 have been done.

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1 Q. By the time you sent this document to Mr Ashton,
2 Mr Crawford, this drawing, in that respect, was out of
3 date.
4 A. But there was no onus to update that because, from that
5 point on, Harley were doing the detailed drawings.
6 Q. Harley, right.
7 Let's look at something else.
8 If you could please be shown the far left-hand side
9 of the drawing, just above the title "Mezzanine Level
10 +9.000". Do you see that?
11 A. Yes.
12 Q. Then three arrows or circles above that, you can see H92
13 776, "Thermal insulation"; do you see that?
14 A. Yes.
15 Q. We can see that this drawing does not record the fact
16 that Celotex FR5000, let alone RS5000, had been
17 specified. Why was that?
18 A. With all due respect, this drawing was from the
19 employer's requirements. Sorry, you're saying --
20 I didn't quite catch that -- the H92 776 reference?
21 Q. Yes, thermal insulation?
22 A. But does that not reference back to the FR5000?
23 Q. Well, it does. If you go back, of course, to the NBS
24 spec, it would say FR5000. My question is: why doesn't
25 thermal insulation either refer to FR5000 or RS5000,

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1 which by this time had now been specified?
2 A. But we didn't -- we didn't know that RS5000 had been
3 specified at that point.
4 Q. I thought that at this point you had the data sheet --
5 A. No, the data sheet --
6 Q. -- for RS5000 --
7 A. Sorry.
8 Q. -- and you told us this morning that you had had
9 a conversation with Mr Bailey, Ray Bailey of Harley, who
10 told you that RS5000 had now been specified?
11 A. Yes, but you're talking about the emails from
12 17/18 September.
13 Q. 18th, yes.
14 A. Yes, but that's when we received the data sheet.
15 Q. Do you know why it was that no product had been
16 specified at all in relation to that arrow with thermal
17 insulation?
18 A. But it has been, because it's referenced back to 776,
19 H92.
20 Q. Okay.
21 A. I'm sorry, I don't really get your point, because --
22 Q. Never mind, I'm just seeking to understand -- really
23 what I'm seeking to get from you, Mr Crawford, is how
24 complete these documents were when you sent them to
25 Mr Ashton so that he could understand the detail -- do

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1 you see? -- that he was after --
 2 A. Yes.
 3 Q. -- in the external wall construction.
 4 A. Can I just clarify, though?
 5 These drawings -- we worked the drawings up to
 6 employer's requirements, the stage E, to the tender set.
 7 After that point, Harley take over, so Harley do the
 8 drawings after that. So what I've sent him is where
 9 the -- we had taken the drawings up to, plus Harley's
 10 drawings. That's the state of the design, that's where
 11 the design is at. And that includes their proposition
 12 for the insulation, which is the same day.
 13 I mean, even if you had gone back and
 14 retrospectively updated it, you wouldn't have been able
 15 to do it the same day. But we weren't under any
 16 obligation to update it, because at this point, this was
 17 Harley's proposals moving forward. Do you see where I'm
 18 coming from?
 19 Q. Let's have a look at another part of this. If you go to
 20 the right-hand side of the drawing, you can see that
 21 there is a label under P10 235. Do you see it says,
 22 "Thermal insulation to prevent cold bridging"?
 23 A. Yes.
 24 Q. And then there's an arrow to a piece of insulation
 25 there.

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1 In fact -- did you know this? -- that thermal
 2 insulation was Rockwool, but the drawing doesn't specify
 3 that Rockwool had been chosen, does it?
 4 A. P10 is in sundry items, and --
 5 Q. Indeed.
 6 A. -- sundry items covers precisely that: sundry items.
 7 Q. Indeed.
 8 A. This detail is of a roller shutter along the ground
 9 floor, so it's specific -- very specific, limited bit of
 10 detail. It's not the overall insulation; it's
 11 a specific bit of insulation behind a very specific
 12 detail.
 13 Q. Let's see if we can get this this way: anybody looking
 14 at these drawings, Mr Ashton receiving them from you,
 15 would not know when he looked at them what the
 16 rainscreen was comprised of or what the insulation
 17 behind the rainscreen was, or indeed what the insulation
 18 to prevent thermal bridging or cold bridging was?
 19 A. No, I disagree.
 20 Q. Why do you disagree?
 21 A. Well, first of all, we sent him the data sheet with the
 22 insulation on it, so that was Harley's proposal, had
 23 their insulation on it, and then clarified the ACM.
 24 Q. Did you send Mr Ashton the NBS spec?
 25 A. I don't recall.

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1 Q. Why not? Sorry, not why don't you recall. Would it not
 2 have been sensible to send him not only the drawings but
 3 the NBS spec so he could see exactly what the details he
 4 was after were?
 5 A. Well, to be clear, my understanding was he did
 6 understand what was being built. So what I sent him was
 7 the Harley details, then Harley's proposal in relation
 8 to the insulation, and then clarified the cladding type.
 9 Q. Why didn't you say to Mr Ashton, "Here are the drawings
 10 and here is the NBS spec so you can make sense of the
 11 materials in the external wall construction"? You
 12 didn't do that, and my question is: why not?
 13 A. Well, NBS spec contains a number of alternatives. What
 14 I was trying to do is communicate what I believed we
 15 were building.
 16 Q. Why didn't you say to Mr Ashton, "I should just tell you
 17 that the bits where it says zinc aren't right anymore,
 18 it's aluminium composite"?
 19 A. But I think I did. There was a follow-up -- I ... zinc
 20 CM and ACM in performance terms, as I understood it,
 21 were the same, and then -- so he worked on the
 22 assumption, I think, of the zinc CM, performance of
 23 which I think had been the same as the ACM. Then at the
 24 end of the conversation I think I did confirm with him
 25 that it was -- my understanding was that we were running

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1 with ACM.
 2 Q. When was that conversation, please?
 3 A. At the same time.
 4 Q. At the same time as?
 5 A. 17th/18th conversation.
 6 Q. That you referred to on Thursday where you told us that
 7 he had said that the Celotex was compliant, the same
 8 conversation as that; is that what you are saying?
 9 A. I think it was, yes, I think it was.
 10 Q. Really?
 11 A. I mean, maybe I've got conversations mixed up.
 12 Q. Do you agree with this proposition: Exova could not have
 13 produced any reliable analysis of the compliance of the
 14 proposed overcladding scheme with requirement B4 of the
 15 Building Regulations without knowing what cladding or
 16 rainscreen and insulation materials were going to be
 17 used in the structure?
 18 A. But they did know.
 19 Q. No, sorry, can I have the answer to my question?
 20 A. Sorry.
 21 Q. Do you agree that Exova couldn't have produced any
 22 reliable analysis of the compliance of the proposed
 23 overcladding scheme with B4 unless they did know what
 24 was being used as the --
 25 A. Yes, if they didn't know, they wouldn't ...

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1 Q. You do, thank you.
 2 You say they did know because you told Mr Ashton --
 3 is this right? -- on the telephone? Is that right?
 4 A. Yeah, I'm pretty sure it was within the conversation,
 5 yes.
 6 Q. Right. On 17 or 18 September; yes? Is that what you're
 7 saying?
 8 A. Yeah, I think -- without going back and checking all
 9 the -- there's so many emails and there's so much data,
 10 I can't recall precisely what was explained when, but my
 11 understanding is that I clarified it with the
 12 insulation.
 13 Q. Now, it's right, isn't it, that Exova never did produce
 14 a further issue of its outline fire safety strategy, did
 15 it?
 16 A. Not that I'm aware of. I remember having the
 17 conversation with Terry about the suitability of the
 18 insulation and the suitability of the cavity barrier
 19 strategy. I remember having these distinct telephone
 20 conversations. And then I remember asking him to put
 21 into an email confirmation that he believed that they
 22 were appropriate.
 23 He did send a response, which I think on reflection
 24 was more of a tacit approval. But my understanding is
 25 that his belief was that it was compliant.

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1 Q. Well, we're going to look at the rest of the email chain
 2 shortly, but just so I understand your answer, you're
 3 saying, are you, that you had a telephone conversation
 4 with Mr Ashton on 17 or 18 September in which he told
 5 you that Celotex RS5000 and Reynobond PE 55 aluminium
 6 composite material rainscreen --
 7 A. ACM.
 8 Q. -- ACM --
 9 A. Yeah.
 10 Q. -- were compliant; is that your evidence? I don't want
 11 to put words in your mouth, I'm trying to summarise what
 12 I think you've been telling me, and if I'm wrong, please
 13 say.
 14 (Pause)
 15 A. My understanding is that in discussing the
 16 fire strategy -- the cavity barrier strategy in relation
 17 to the wall build-up, he understood what the build-up
 18 was, we had sent him the insulation detail -- the
 19 insulation data sheet, and he understood what the cavity
 20 barrier strategy was and he understood what the cladding
 21 panel build-up was, and I asked him to confirm that in
 22 writing.
 23 Q. And you say that he did confirm it in writing, but only
 24 tacitly?
 25 A. He confirmed in writing that he thought that it was

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1 appropriate, but on reflection it's more of a tacit
 2 approval than an explicit one.
 3 Q. Right.
 4 A. When I re-read it.
 5 Q. We will come to see what we do see in writing shortly.
 6 Just to be clear, it's right, certainly from the
 7 documents that the Inquiry has seen, that Exova's
 8 proposition in its issue 3 of its outline fire safety
 9 strategy of 7 November 2013 that the proposed changes
 10 would have no adverse effect on the building in relation
 11 to external fire spread was never confirmed by any
 12 analysis by Exova?
 13 A. That's correct.
 14 Q. And it was never confirmed by any other specialist fire
 15 consultant in any report during the period you were
 16 project architect on Grenfell?
 17 A. Not that I'm aware of.
 18 Q. You never sought to chase one up, and is that because --
 19 and, again, I don't want to put words in your mouth --
 20 of what you say are the assurances that Mr Ashton gave
 21 you over the telephone on 17 or 18 September?
 22 A. Yeah. Well, I remember having conversations with
 23 Mr Ashton on a number of occasions across the project,
 24 on a number of issues, separate issues. But I remember
 25 on the -- on this particular issue in relation to the

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1 cavity barriers and when the data sheet for the
 2 insulation was sent, I remember him alluding to the fact
 3 that he would have to complete the report or something
 4 of that nature, and I never thought any more of it,
 5 firstly because I basically had the conversation with
 6 Bruce about what I understood we had and whether it was
 7 compliant, and then had the conversation with Exova, and
 8 to me, Exova just confirmed that, yes, what we
 9 understood was compliant was compliant, and that was it,
 10 and ...
 11 Q. Right.
 12 Let's go back to the email chain. Going back to it
 13 at {SEA00011719}, you can see at the second email down
 14 on the first page -- this is in response to you, where
 15 you sent him the fairly limited drawings -- he,
 16 Terry Ashton, comes back to you, and we're now at
 17 18 September at 15.32; do you see that?
 18 A. Yes.
 19 Q. "Neil
 20 "If the insulation in the cavities behind the
 21 rainscreen cladding is combustible [note the 'if'] you
 22 will need to provide cavity barrier as shown on your
 23 drawing (number 1279 (06) 120) in order to prevent fire
 24 from spreading from one flat to the one above even if
 25 there isn't a continuous cavity from the top to the

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1 bottom of the building.
 2 "Kind regards
 3 "Terry."
 4 Do you see that?
 5 A. Yes.
 6 Q. Now, clearly by this point in the day, 18 September,
 7 3.30, you hadn't yet had this telephone conversation
 8 with Mr Ashton where he confirmed that Celotex was
 9 compliant and that ACM was compliant, as you now say,
 10 had you?
 11 (Pause)
 12 The reason I say that, to be clear, is he is saying
 13 "If the insulation in the cavities behind the rainscreen
 14 is combustible". If you had the discussion with him
 15 about Celotex being non-combustible, as you tell us,
 16 then that conversation must have happened after 15.32 on
 17 18 September, mustn't it?
 18 A. Not necessarily. I mean, he's saying "If the insulation
 19 in the cavities behind the rainscreen is combustible" --
 20 he may have understood the information I had given that
 21 that was the case.
 22 Q. Well, if he had understood that the information you had
 23 given him showed that the rainscreen was combustible,
 24 and the insulation in the cavities was combustible -- we
 25 can ask him -- then that would not reflect the

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1 conversation that you're telling us you had with him.
 2 A. Can you just pull up the email when the data sheet was
 3 forwarded? Because I'm losing track -- there's so many
 4 emails, I'm losing track of what was sent when.
 5 Q. Indeed. Yes, we can do that.
 6 A. It's eight years, six years ago.
 7 Q. Yes, we can do that. If you go to the email at
 8 {SEA00011730/2}. I think the one you're after is at
 9 16.03, which is where Daniel Anketell-Jones says to you,
 10 "The insulation is class 0."
 11 A. Yes, but --
 12 Q. That's after -- to be fair to you -- the conversation,
 13 or rather after the email I've just shown you at just
 14 before 3.30 on the same day.
 15 A. What I'm trying to establish is: do you have the email
 16 with the attachment on it that was sent?
 17 Q. Yes, and we looked at that earlier. If you stay on this
 18 page -- it's {SEA00011730/2} -- we can see, and we will
 19 go back to this again, go back to this at page 2, second
 20 email down, that's where Daniel Anketell-Jones tells you
 21 the insulation is class 0 and then you email
 22 Terry Ashton saying, "Is this interpretation
 23 correct ...?"
 24 A. What I'm trying to establish is the email that had the
 25 data sheet on it, because that's -- the data sheet was

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1 forwarded to Terry, so that would give you the time.
 2 Q. Yes, and according to your statement at 192, you say you
 3 sent that comment to Exova together with the data sheet.
 4 A. Okay, so which --
 5 Q. That's what you said in your statement.
 6 A. I'm really confused.
 7 Q. I agree with you, you can't see it from the email,
 8 because the email doesn't refer to an attachment, but
 9 you say in your statement that it does.
 10 A. Yeah. The problem with the way these emails are
 11 presented, when you see the actual email in Outlook, you
 12 can see the attachment. With this, I can't, and that's
 13 why I can't determine which one the attachment was on.
 14 Q. Yes. I'm just trying to establish the time on the day
 15 at which you had the conversation you're referring to.
 16 I think we have established that it wasn't before the
 17 email when you go back to him sending him the detailed
 18 drawings, so it must have been after that.
 19 Do you think it was after the exchange of emails
 20 where you say you get the data sheet from
 21 Daniel Anketell-Jones and then send it on to
 22 Terry Ashton?
 23 A. I think it would have been after, yes, that's logical.
 24 Q. Right.
 25 So going to the email chain, then, and still on this

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1 page, it's not inconvenient to stick with this
 2 reference, if we can scroll down a little bit, please,
 3 this email chain at page 2, just to see the top of it.
 4 I am afraid it goes over two screens. If you could
 5 scroll up to the top of page 2, I think that's the email
 6 we want.
 7 Daniel Anketell-Jones says to you the insulation is
 8 class 0, and that's at 16.03. You say to
 9 Terry Ashton -- if we could scroll down, please, because
 10 we have only got half the email -- this is at 15.32, and
 11 then you go back to him -- this isn't right -- at 15.50.
 12 Okay, what's gone wrong here, I am afraid, is
 13 I don't think my instructions to the operator are
 14 getting through.
 15 Could I please be shown the top half of page 2 of
 16 this document and the bottom of page 1. So we can see
 17 the email to you from Daniel Anketell-Jones at 16.03,
 18 and then you're sending that to Terry Ashton at --
 19 bottom of page 1, please -- 16.07, if you look at
 20 page 1. We have managed to get both parts of the email
 21 string up on the screen.
 22 So you send this on to Terry Ashton at 16.07; yes?
 23 Then he responds to you at 16.21.
 24 A. 16.03 and 16.21 are the times I'm seeing.
 25 Q. Right. So let's take it even more slowly.

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1 On the right-hand side you have
 2 Daniel Anketell-Jones telling you insulation is class 0,
 3 16.03.
 4 A. Yeah.
 5 Q. The email, which is I am afraid split over two pages
 6 which you send to Terry Ashton is at 16.07, if you look
 7 on the screen in the bottom left-hand --
 8 A. Sorry, I see what you're saying.
 9 Q. Above that, Terry Ashton comes back to you at 16.21.
 10 A. Okay.
 11 Q. Where he says, "A material which has a Class 0 ..." Do
 12 you see that?
 13 A. Yes.
 14 Q. So just to be clear about timing, which is what I'm
 15 trying to look at with you, you say, I think, that
 16 Daniel Anketell-Jones sends you the data sheet at 16.03,
 17 you send that on to Terry Ashton at 16.07, four minutes
 18 later -- yes?
 19 A. Yeah.
 20 Q. And then Terry Ashton responds to you, 13 minutes after
 21 that or so, when he says:
 22 "Neil
 23 "A material which has a class 0 rating is not
 24 necessarily non-combustible ..."
 25 Do you see that?

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1 A. Yes.
 2 Q. Right.
 3 Now, just to finish off the answer, perhaps we can
 4 look at the very top of page 1 {SEA00011730/1}, just for
 5 the timing.
 6 You then go back to Terry at 17.12 and say:
 7 "Hi Terry
 8 "Thank you.
 9 "Daniel,
 10 "Can you confirm your position in relation to
 11 Terry's comment below regarding combustibility and
 12 continuous cavity paths."
 13 I don't need the rest, unless -- well, you can
 14 certainly look at the rest, but I don't want to ask you
 15 about the rest.
 16 So that's the email chain on that day. Do you see
 17 that?
 18 A. Yes.
 19 Q. Now, when do you think, looking at that email chain, you
 20 had your conversation with Mr Ashton about Celotex
 21 RS5000 being a material of limited combustibility or not
 22 combustible?
 23 A. Well, it would have been after I sent him the data
 24 sheet.
 25 Q. After you sent him the data sheet but before he

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1 responds?
 2 A. I couldn't tell you precisely, but it would have been
 3 after I sent the data sheet because the data sheet would
 4 have been to inform him.
 5 Q. Right.
 6 Now, let's just look even more closely at your
 7 statement.
 8 At paragraph 192, if you go back to it, it's page 62
 9 {SEA00014275/62}, you say:
 10 "In response to the comment
 11 Daniel Anketell-Jones ... stated 'The insulation is
 12 class 0.'
 13 You set out the rest of the quotation and then you
 14 say:
 15 "Again, I forwarded the comment to Exova, together
 16 with the datasheet for Celotex RS5000 dated August 2014
 17 that Daniel had attached to his email."
 18 You see that?
 19 A. Yes.
 20 Q. That's what you say. But do you accept that, looking at
 21 the emails -- if we can just go back to them, please --
 22 that we had a minute ago on the screen, {SEA00011730/2},
 23 which is what you're referring to, which is the one from
 24 Anketell-Jones to you at 16.03, do you accept that
 25 looking at that, neither Mr Anketell-Jones' email to

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1 you, nor yours to Mr Ashton, referred to an attachment?
 2 A. This comes back to what I said earlier. I was trying to
 3 establish which email had the attachment on it, and
 4 I can't see it from the way these are presented here.
 5 If you -- you know, when you're in Outlook, you see your
 6 email and it's got an attachment, so you know. Because
 7 of the way this is presented, I can't tell.
 8 Q. Perhaps, to be fair to you, we could show you
 9 a different email, or rather the same email in
 10 a different guise. If you look at {SEA00011724}, which
 11 is the one you refer to in your statement, that's what
 12 you refer to in your statement and it's on the screen
 13 there. But, again, we don't, I think, see
 14 Mr Anketell-Jones sending you the data sheet, do we?
 15 I don't think Mr Anketell-Jones sends you the data
 16 sheet, because his email doesn't have an attachment to
 17 it and he doesn't refer to an attachment, does he?
 18 A. Well, that's how it would appear there.
 19 Q. Right.
 20 SIR MARTIN MOORE-BICK: Just a minute, Mr Millett. The top
 21 half of this page does seem to refer to an attachment,
 22 doesn't it?
 23 MR MILLETT: It does. I was just going to come to that,
 24 Mr Chairman.
 25 SIR MARTIN MOORE-BICK: Right.

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1 MR MILLETT: I just want to work out where the attachment
 2 originates.
 3 A. Sorry, can I just interject? The data sheet was sent
 4 from Harley to me; correct?
 5 Q. Well, you tell me.
 6 A. Well ... it says here, "Attachments: rainscreen cladding
 7 product datasheet".
 8 Q. Yes. Well, let's try a different way of going about it.
 9 SIR MARTIN MOORE-BICK: I think the point Mr Millett is
 10 putting to you is you can see from the top half of this
 11 page that where there is an attachment, it's referred
 12 to.
 13 A. Yes.
 14 SIR MARTIN MOORE-BICK: And this is you sending that data
 15 sheet to Mr Ashton.
 16 A. Yes.
 17 SIR MARTIN MOORE-BICK: What we don't see, either in the
 18 bottom half of the page or, I think, in any other email
 19 we have looked at so far, is an attachment to an email
 20 from Mr Anketell-Jones to you.
 21 Is that your point, Mr Millett?
 22 MR MILLETT: Yes. That's right.
 23 So just looking at these two emails, Anketell-Jones
 24 to you and you to Mr Ashton, Anketell-Jones doesn't
 25 attach the data sheet or refer to it; correct?

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1 A. It would seem that way.
 2 Q. Yes. So we move to the next question.
 3 You then go to Mr Ashton and clearly you do attach
 4 the data sheet.
 5 A. Yes.
 6 Q. My question is: was it you who decided to attach the
 7 data sheet to the email you were sending Mr Ashton, or
 8 were you, as is possible, just forwarding it on?
 9 (Pause)
 10 A. I can't recall without seeing all the emails. This is
 11 the problem. I'm used to looking at the historic emails
 12 and then you can see and you can piece the things
 13 together. I'm getting excerpts here.
 14 What I think happened is I was forwarding -- what
 15 I understood was, from my recollection, that it was
 16 forwarded to me from Harley and then I forwarded it to
 17 Exova. That's what I recollect. But because I don't
 18 have that --
 19 Q. Over the lunch break we will see if we can find that,
 20 because that may well be true. What happens sometimes
 21 is you don't always see the attachments on the versions
 22 of the emails that come up.
 23 But let's just focus on the message in the email.
 24 It's certainly right, looking at these emails, that
 25 Mr Anketell-Jones doesn't tell you to look at the

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1 attachment, look at the data sheet, and you don't
 2 mention the data sheet to Mr Ashton, do you, when you
 3 send it on?
 4 A. Within the email you're showing me here, no, but --
 5 Q. No. And your witness statement doesn't refer to any
 6 discussion with Mr Ashton in which you say that he told
 7 you that Celotex FR5000 was compliant with Approved
 8 Document B as a material of limited combustibility.
 9 A. You are talking about RS5000 at this point.
 10 Q. All right.
 11 A. The data sheet was from RS5000.
 12 Q. You are quite right.
 13 A. That's the whole point. The RS5000 was sent to me. It
 14 was sent to me from Harley and then I forwarded it from
 15 Harley to Exova. That's the whole point. I wouldn't
 16 have forwarded it otherwise.
 17 Q. You are absolutely right, Mr Crawford. I mis-asked the
 18 question. Let me ask it again.
 19 Your witness statement doesn't refer to any
 20 discussion with Mr Ashton in which he told you that
 21 Celotex RS5000 was compliant with Approved Document B?
 22 A. Correct, it may not refer to any discussion, but there
 23 were discussions going on.
 24 Q. Nor does it refer to any discussion in which he told you
 25 that RS5000 was a material of limited combustibility,

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1 does it?
 2 A. But I never said that he did.
 3 Q. And there is no email record where you actually asked
 4 him the question: "Terry, is RS5000 compliant with the
 5 Building Regulations?"
 6 A. Categorically, no, but I sent -- I had sent him that as
 7 a package of details of the build-up.
 8 Q. And all you asked him when you sent him the data sheet
 9 is, "Is this interpretation correct?" You don't ask
 10 him, "Is RS5000 compliant with the Building
 11 Regulations?", do you?
 12 A. No, but he's asked for details of the build-up. I've
 13 sent him details of the build-up and have clarified what
 14 the proposed insulation type is. There's a series of
 15 conversations that took place around that. For sure
 16 there was more than one telephone conversation. What
 17 I do not have is a record of all those conversations,
 18 I just have a sense of what was sent and what I agreed.
 19 Q. Given the absence of any reference in your witness
 20 statement to a telephone conversation with Mr Ashton on
 21 the subject of whether Celotex RS5000 complied, are you
 22 quite sure in your recollection, as you told us on
 23 Thursday and again this morning, that you actually did
 24 have a conversation over the telephone with him?
 25 A. There were definitely conversations going on in parallel

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1 with the emails, for sure.
 2 Q. Can you explain why it is that your witness statement,
 3 which is lengthy and detailed, made absolutely no
 4 reference to such a telephone conversation?
 5 A. Well, there was a lot of telephone conversations that
 6 took place, so I wouldn't have recorded them all, and
 7 also you can't say precisely what you said in telephone
 8 conversations, you only know what you discussed in
 9 general terms, let's say.
 10 Q. Given that you knew by this stage that Exova had
 11 promised a further analysis as to whether the proposed
 12 cladding would comply with Approved Document B so far as
 13 external fire spread was concerned, and given what you
 14 now tell us, namely that you had a conversation over the
 15 telephone that Celotex RS5000 complied, was that not
 16 something that you would have put in your witness
 17 statement --
 18 A. No, you --
 19 Q. Mr Crawford, I'm going to ask the question and you can
 20 answer it.
 21 Is that not something that you would have put in
 22 your witness statement, had it actually happened?
 23 A. To be clear, the conversation that I had was in relation
 24 to the cavity barrier proposal in relation to the
 25 build-up. That was the conversation I was having.

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1 Q. Indeed. But given -- it is a "but" -- the importance
 2 of, as Exova had said, getting a future analysis of
 3 whether or not the proposed overcladding complied with
 4 ADB, and given what Mr Ashton, you say, was telling you
 5 over the telephone in the middle of this email string on
 6 the afternoon of 17 September, I'm suggesting to you,
 7 I'm putting it to you, that you would have recorded that
 8 in writing at the time and you would have put it in your
 9 witness statement.
 10 A. No.
 11 Q. My question to you is: you didn't; why not?
 12 A. I'm trying to explain to you how -- what I understood
 13 happened, first of all, that's what I'm trying to say,
 14 is that the conversation was in relation to the cavity
 15 barrier strategy. Harley sent me additional information
 16 in relation to the RS5000, and Exova were looking for
 17 clarification of what the details and the build-up was,
 18 and that was what -- that's what was going on in those
 19 conversations, and that email conversation backwards and
 20 forwards. That was what was being tried to -- that was
 21 what was being established.
 22 I mean, it was primarily around the cavity barrier
 23 strategy, but it sucked in other stuff. It wasn't --
 24 the conversation wasn't about them doing this follow-up
 25 report. That wasn't what the conversation was about.

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1 The conversation was about the cavity barrier strategy,
 2 but it inevitably brought the other elements into the
 3 conversation.
 4 MR MILLETT: Right.
 5 Mr Chairman, is that a convenient moment?
 6 I'm afraid I'm mid-stream, but ...
 7 SIR MARTIN MOORE-BICK: Well, I don't think we can do much
 8 about that.
 9 MR MILLETT: No.
 10 SIR MARTIN MOORE-BICK: We are going to have a break now,
 11 Mr Crawford. Again, please don't talk to anyone about
 12 your evidence or things related to it --
 13 A. Can I just say, I don't want you to feel I'm being
 14 obstructive, I'm just trying to recollect relative to
 15 what I know I had in emails and in notional
 16 conversations that I know I had round about the same
 17 time. It's very difficult because there are definitive
 18 email trails, but there are a lot of telephone
 19 conversations and I'm trying to link them in logically
 20 to what I was talking about at the time. That's why I'm
 21 emphasising, this was a conversation about cavity
 22 barriers but it expanded from that, and you could see
 23 that because it brought the insulation into that
 24 conversation. But it wasn't a categoric conversation
 25 about dealing with the follow-up report.

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1 MR MILLETT: I understand.
 2 A. Do you see what I'm saying?
 3 MR MILLETT: I do.
 4 A. I don't want you to feel that I'm somehow dodging or
 5 not ... you know, I'm trying my best to relay what
 6 I understood happened.
 7 SIR MARTIN MOORE-BICK: We understand that.
 8 A. Yes.
 9 SIR MARTIN MOORE-BICK: Thank you for clarifying.
 10 All right, would you like to go with the usher,
 11 then, please.
 12 THE WITNESS: Yes.
 13 SIR MARTIN MOORE-BICK: We will resume at 2.05, please.
 14 (Pause)
 15 2.05, please. Thank you.
 16 (1.05 pm)
 17 (The short adjournment)
 18 (2.05 pm)
 19 SIR MARTIN MOORE-BICK: Right, Mr Crawford, happy to carry
 20 on?
 21 THE WITNESS: Yes.
 22 SIR MARTIN MOORE-BICK: Yes, Mr Millett.
 23 MR MILLETT: Mr Crawford, before lunch we were looking at
 24 some emails between Harley and you and you and Mr Ashton
 25 at Exova, and one of the questions that arose was

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1 whether or not you had got the data sheet for RS5000
 2 from Harley. Let me just be clear about that, to be
 3 fair to you.
 4 Can I show you, please, a document {BSD00001420}.
 5 This actually has come from Kevin Lamb's disclosure.
 6 What it shows is that on 18 September, looking at the
 7 top email on page 1, Daniel Anketell-Jones sends you the
 8 data sheet at 16.03, and then in the email says, "The
 9 insulation is class 0". Then you send that on, although
 10 we can't see it on this version of the email string, to
 11 Terry Ashton a few minutes later saying, "Terry, is this
 12 interpretation correct?"
 13 So does that help you orientate yourself in where
 14 you got the data sheet from? It's clear from this that
 15 you did get it from Mr Anketell-Jones of Harley.
 16 A. Well, I knew. With all due respect, that's what
 17 I understood.
 18 Q. No, exactly.
 19 A. Yeah.
 20 Q. One of the problems that we have, so you know, is some
 21 of the email strings don't always show the attachments
 22 because of the way they've been archived. So that was
 23 the position.
 24 Now, can we go back to the email where you do
 25 forward the message to Mr Ashton, "Is this

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1 interpretation correct?" That's {SEA00011730/2}.
 2 Again, I'm afraid we have the slight difficulty
 3 about the time, but it doesn't perhaps matter. You say:
 4 "Is this interpretation correct (see below)?"
 5 Is it the case that you yourself were not
 6 sufficiently familiar with the regulations and Approved
 7 Document B in particular to know if Mr Anketell-Jones'
 8 interpretation was correct?
 9 A. I think in relation to something like -- part B is
 10 a very technical document, and some aspects of it are
 11 quite apparent and some aren't, and particularly where
 12 I would consider this to some extent specialist, then
 13 I think it's right to verify it with a specialist, and
 14 that's what I was looking to do, to check that the
 15 interpretation was the same as Daniel's.
 16 Q. So you didn't go back to Approved Document B yourself
 17 and check the requirements for limited combustibility?
 18 A. Not that I recall.
 19 Q. Okay. Is there a reason why, as we can see, you didn't
 20 volunteer any commentary in your message to Mr Ashton?
 21 A. Not that I recall. I mean, I know I've mentioned before
 22 the break there were telephone conversations as well,
 23 but I don't ... I don't recall anything specific in
 24 relation to this particular question.
 25 Q. We can see from this email that you didn't ask Mr Ashton

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1 any particular queries regarding the technical detail.
 2 Is there a reason why you didn't?
 3 (Pause)
 4 A. No, I mean, as I said, there were telephone
 5 conversations going on as well, and I just can't recall
 6 precisely -- because I know that's what you're looking
 7 for: precise -- precisely what those were and precisely
 8 what was discussed.
 9 Q. Yes, I mean, I don't think you're saying there was
 10 a telephone conversation between 16.03 and 16.07.
 11 A. No, but you're asking about what's being said in terms
 12 of technically.
 13 Q. Yes. So my question again: why didn't you ask Mr Ashton
 14 any specific questions regarding the technical detail
 15 that you were being given by Mr Anketell-Jones?
 16 A. Well, I've asked him if the interpretation is correct.
 17 Q. If we go up to the first page of that email chain
 18 {SEA00011730/1}, we can see Mr Ashton's response on
 19 18 September 2014 at 16.21. We looked at this a little
 20 bit before, but he says:
 21 "Neil
 22 "A material which has a Class 0 rating is not
 23 necessarily non-combustible although the reverse is
 24 invariably true. Some Class 0 products will burn when
 25 exposed to a fully developed fire."

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1 Just looking at the first sentence I've shown you,
 2 did you understand what Mr Ashton meant when he said
 3 that a class 0 rating is not necessarily
 4 non-combustible, although the reverse is invariably
 5 true?
 6 A. I think so, yes.
 7 Q. What? What did you understand by that?
 8 A. That ...
 9 (Pause)
 10 A non-combustible material will be, by default,
 11 class 0.
 12 Q. Right. What about the other way round?
 13 A. What do you mean the other way round?
 14 Q. Well, the obverse, the reverse. What did you understand
 15 him to mean by that? He says "The reverse is invariably
 16 true". What did you understand by that?
 17 A. Just what I said, which is a non-combustible will be by
 18 default class 0.
 19 Q. And that class 0 by contrast, what? You say
 20 "Non-combustible will always be class 0 by default"?
 21 A. Well, class 0, as he stated, the rating is not
 22 necessarily non-combustible.
 23 Q. Exactly.
 24 A. Yes.
 25 Q. That leads to the next question: in what circumstances

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1 would a class 0 rating not be non-combustible, did you
 2 think?
 3 (Pause)
 4 A. Well, the test method for class 0, the 476 test, the
 5 BS 476 test, is effectively a surface test. You --
 6 well, it's a small square and you hold a flame under it.
 7 Whereas the BS EN 13501 test is a through material test.
 8 Q. What you have just given to me by way of an explanation,
 9 was that something you knew at the time? Was that
 10 something you were alive to?
 11 A. No, no.
 12 Q. I see, okay.
 13 Let me ask a question in a slightly different way.
 14 What was your takeaway, your basic understanding, from
 15 Mr Ashton's message that class 0 rated material was not
 16 necessarily non-combustible?
 17 A. Well, it could be class 0 and be of limited
 18 combustibility, for example.
 19 Q. In what circumstances would something which was class 0
 20 be of limited combustibility, did you think at the time?
 21 A. I don't know if I did think at the time.
 22 Q. Right.
 23 I mean, did you ask yourself the question: well,
 24 what does it depend on? When would it be necessarily
 25 non-combustible and when wouldn't it be?

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1 A. I don't think I thought that far.
 2 Q. Right.
 3 So did you ever learn in the end whether RS5000 was
 4 in fact combustible, non-combustible or of limited
 5 combustibility?
 6 A. I think I suspected it was limited combustibility, but
 7 my method of verification was -- for its suitability in
 8 the proposed build-up was with Exova.
 9 Q. Just following that up, you say "I think I suspected it
 10 was limited combustibility"; did you ever actually learn
 11 whether it was?
 12 A. Categorically, no.
 13 Q. Does that mean that from September 2014, Mr Crawford,
 14 you were at least alive to the fact that you couldn't
 15 rely on a class 0 fire rated classification for
 16 insulation as demonstrating, without any further
 17 questions being asked, that the insulation was of
 18 limited combustibility?
 19 A. I don't think I thought that far. I mean, I think
 20 I just ... I took the product and I read the -- my
 21 interpretation was as per my witness statement in terms
 22 of how I read the statements that were made in the front
 23 of the product, and then I sent it to -- had the
 24 conversation, sent it to Exova to verify that my
 25 understanding was that it was effectively compliant

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1 within the build-up.
 2 Q. Now, you then go to the top of the email chain, please,
 3 which is {SEA00011730/1}, at the very top. This is your
 4 response back to Terry Ashton, same day,
 5 18 September 2014, at 17.12, so just about 55 minutes
 6 after you received his email at 16.21. You say:
 7 "Hi Terry
 8 "Thank you."
 9 You cc this to Daniel Anketell-Jones at Harley and
 10 Simon Lawrence at Rydon and Simon O'Connor as well, and
 11 Kevin Lamb indeed. You say:
 12 "Daniel,
 13 "Can you confirm your position in relation to
 14 Terry's comment below regarding combustibility and
 15 continuous cavity paths."
 16 Then you talk about the Kensington Aldridge Academy.
 17 What did you mean, do you remember, by confirm his
 18 position, "Can you confirm your position", when you
 19 asked Daniel Anketell-Jones that question?
 20 (Pause)
 21 A. I suppose that he agreed with Terry's interpretation.
 22 Q. Right.
 23 It's fair to say, because we can see it here, that
 24 you didn't offer any commentary on Mr Ashton's email or
 25 ask any questions back to Mr Anketell-Jones, did you?

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1 A. Well, I can only go by what's in the emails.
 2 Q. Looking at it in the round -- and tell me if this is
 3 unfair, Mr Crawford -- isn't it fair to say that in
 4 respect of this design issue, cavity barriers interlaced
 5 with combustibility of the insulation, you were
 6 attempting really to act as a go-between as between
 7 Harley on the one hand and Exova on the other, without
 8 really engaging with the substance of the problem?
 9 A. No, I think that's a little unfair. I mean, I think ...
 10 I think on one hand you had Harley, who were proposing
 11 something that was albeit a slight deviation from what
 12 was in the employer's requirements, and you have the
 13 specialist fire consultant on the other, and I was
 14 trying to, if you like, arbitrate between the
 15 interpretations, and make sure that what was being
 16 proposed would ultimately be compliant.
 17 Q. You say you were "if you like, arbitrating between the
 18 interpretations" --
 19 A. That's probably not the best use of --
 20 Q. No, I'm not going to pick you up on the word
 21 "arbitrate", I understand that might be a lawyer's
 22 phrase misused, but is it right to say that you were
 23 essentially acting as a middleman, receiving the
 24 question from Harley, punting it off to Exova to answer,
 25 getting the answer back from Exova, and then punting it

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1 back to Harley?

2 A. Well, what I would say is the proposal by Harley was not

3 mine, and so it wouldn't necessarily be one I would

4 make, and then I wouldn't attempt to interpret something

5 as specialist as that without going to the specialist .

6 So I was co-ordinating between the two.

7 Q. That was how you saw your role, was it?

8 A. Yeah.

9 Q. One of co-ordination, rather than inputting any

10 professional advice yourself?

11 A. Yeah. Well, I wouldn't see it as checking for

12 compliance.

13 Q. You wouldn't see it as checking for compliance?

14 A. No.

15 Q. One way or the other?

16 A. No, I was seeking to ensure that it was compliant, but

17 not specifically checking myself that it was compliant.

18 Q. Okay.

19 Can I ask you to stay on this page and look back at

20 the second email from Mr Ashton. This is the one at

21 16.21 to you. We have looked at the first two

22 sentences. He then goes on to say:

23 "In any case, you need to prevent fire spread from

24 on flat to the flat above as I stated in my earlier

25 email. What isn't clear from the information to hand is

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1 whether or not there is a continuous cavity from top to

2 bottom in any part of the cladding (apart from around

3 the column casings) irrespective of the type of

4 insulation?"

5 Just a few questions about what he says there,

6 because I want your understanding. Obviously Mr Ashton

7 will come and explain what he meant.

8 Did you understand that there were actually two

9 separate issues here: there was the type and the fire

10 performance of the insulation on the one hand, and also,

11 on the other, the design scheme for cavity barriers?

12 Did you see that as two separate issues?

13 A. He's highlighted that as two separate issues, yes.

14 Q. Yes. Did you appreciate that the question of whether

15 there should be cavity barriers along compartment floor

16 lines was not determined by the combustibility rating of

17 the insulation used?

18 A. Sorry, I'm just going to re-read it .

19 Q. Yes, of course.

20 (Pause)

21 A. Yes, I think that's what he's saying.

22 Q. Did you appreciate that the question of whether there

23 should be -- this is my question to you --

24 A. I had always assumed there should be cavity barriers

25 around the compartments. I've never thought anything

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1 other than that. I mean, it's interesting, I think on

2 the original RFI, the proposal that I see Harley

3 suggesting is to address with -- is mainly to address

4 the chimney effect, and this is something that Terry's

5 picked up in this where he talks about the continuous

6 cavities from top to bottom. You can see that's his

7 primary concern. And I think that concern probably is

8 illustrative of how people in the industry, with that

9 type of cladding, would think.

10 But I don't think it -- I think, being prudent, you

11 would always be looking to maintain the compartment and

12 protect the compartment.

13 Q. Right.

14 Just to come back to my question about the

15 distinction again. Let me ask it slightly differently .

16 Did you think, or did it occur to you, that Harley

17 had misunderstood the distinction here between, on the

18 one hand, the question of the type and fire performance

19 of the insulation, and, on the other hand, the design

20 scheme for cavity barriers?

21 (Pause)

22 A. Can you ask that again, sorry?

23 Q. Yes.

24 You and I have agreed that there are two separate

25 issues here: there is the type and fire performance of

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1 the insulation and there is the design scheme for cavity

2 barriers. My question is whether you thought at the

3 time that Harley had lacked an understanding of that

4 distinction .

5 A. I think that's a question for Harley.

6 Q. I'm asking you whether you thought they might have done.

7 (Pause)

8 A. I don't know.

9 Q. Okay. All right .

10 A. It's possible .

11 Q. Do you accept that the specification of insulation that

12 doesn't comply with the Building Regulations and the

13 guidance in Approved Document B is something that should

14 have been, in your words, manifest to the reasonable

15 architect or any architect or any person performing the

16 role of an architect on a project to overclad a building

17 in excess of 18 metres in height?

18 A. I think it's your duty to seek to check that it

19 complies -- seek to ... to make sure that it -- seek to

20 ensure that it does comply, yes.

21 Q. Would you accept, as a general proposition, Mr Crawford,

22 that a subcontractor omitting cavity barriers from

23 locations where they are required by Approved Document B

24 to the Building Regulations and the guidance in it

25 should have been manifest to any architect engaged on

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1 a project to overclad a building in excess of 18 metres
 2 in height?
 3 A. Not necessarily. They may have -- I mean, they may have
 4 their reasons. You say omit in relation to ADB2, but
 5 ADB2 is only guidance on where to place cavity barriers.
 6 It's not -- it doesn't guarantee that you are -- that
 7 you would be compliant, even if you did place them
 8 there, nor is it the only means by which you could
 9 determine to place them there, nor is it, in my opinion,
 10 specifically diagram 33 in section 9, fit for purpose as
 11 a method for determining where to place cavity barriers.
 12 I would always seek -- again, I would always seek
 13 specialist input in order to determine that,
 14 particularly where this narrow[sic] fell outside that
 15 described in section 9, diagram 33, which in this case
 16 it did, in my view.
 17 Q. Do you accept or, perhaps better put, is it your
 18 experience that an architect on a project such as this,
 19 prior to novation, should have taken the lead in sorting
 20 out compliance issues before the full plans application
 21 was submitted to RBKC building control?
 22 A. I believe that the team, the people involved in that,
 23 did believe that what they had proposed was compliant.
 24 Q. You believe that now or you believed that at the time?
 25 A. I believed that at the time and I believe that they

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1 believed that at the time now.
 2 Q. Did it surprise you when the question of whether RS5000
 3 was a material of limited combustibility arose, as we've
 4 seen in this email chain, in the March of 2015, that
 5 that hadn't been sorted out and that question answered
 6 prior to the full plans application being submitted to
 7 RBKC building control in the distant past?
 8 A. But I think that the issue of using RS5000 or the --
 9 then the equivalent of FR5000, I believe that they did
 10 believe that was compliant.
 11 Q. And the basis of your belief is what?
 12 A. The conversations that I had at handover, and the
 13 conversations I had when I checked the RS5000 with
 14 Bruce. I mean, he, to my mind, was of the opinion that
 15 the scheme and what had been proposed was compliant.
 16 I don't think NS(?) had any view to doubt that. But
 17 then I checked with Exova, with the new product or
 18 variant of the same product, whatever you want to call
 19 it, that it was compliant, and now it's my understanding
 20 that it was.
 21 Q. You see, given that you say you had had these
 22 conversations with Bruce Sounes at handover about the
 23 compliance of the insulation at that stage, my question
 24 is really whether it came as a surprise to you to
 25 discover in March 2015, some nine or eight months later,

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1 that the question of whether or not the Celotex RS5000
 2 was of limited combustibility had arisen. Did that not
 3 come as a surprise to you, given you thought it was
 4 something that had been resolved already?
 5 A. Sorry, I'm not sure I really understand the question.
 6 Q. You told us, I think -- and correct me if this is
 7 wrong -- that during your handover discussions with
 8 Bruce, he had led you to believe that the specification
 9 of what was then FR5000 Celotex as the insulation
 10 product for the use on Grenfell Tower had been
 11 compliant.
 12 A. Yes.
 13 Q. That's what you told us. My question then is: did it
 14 not come as a surprise to you to learn in March 2015,
 15 some eight or so months after the handover from
 16 Bruce Sounes, that there were questions around whether
 17 the Celotex material was compliant or not?
 18 A. By -- I never saw them -- that there were questions;
 19 I was simply seeking to verify that what Harley were
 20 proposing was compliant.
 21 Q. Why?
 22 A. Because it was a different title product.
 23 Q. You say you had discovered that it was a different kind
 24 of product --
 25 A. No, different title to the product. It was RS5000.

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1 Q. And you discovered that it was RS5000 I thought you had
 2 said in September, which is now.
 3 A. Yes.
 4 Q. 2014.
 5 A. When it was forwarded to me by Daniel is when
 6 I forwarded it to Exova.
 7 Q. Yes.
 8 A. Yes.
 9 Q. So did it not come as a surprise to you to discover that
 10 when Bruce Sounes had told you that it was a compliant
 11 material, that matter had not been actually got to the
 12 bottom of?
 13 A. But I don't think that's what happened or what I'm
 14 saying.
 15 Q. Right.
 16 A. I mean, at the tender stage, at the stage E of the
 17 employer's requirements, there was a product in there,
 18 the FR5000. I understood Bruce understood that that
 19 product was compliant. When the specialist
 20 subcontractor is putting together his package of
 21 information, he brought forward the data sheet for this
 22 product, RS5000, which for all intents and purposes
 23 seemed to be reasonably similar, but then this was
 24 forwarded to Exova to check for compliance.
 25 Q. Right.

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1 A. This is what happened. This is how I see it.
 2 Q. I see. So as far as you were concerned, this was quite
 3 a new issue and had to be resolved?
 4 A. It was only a new issue inasmuch as the product name was
 5 different.
 6 Q. Right.
 7 Now, can I ask you to go to your witness statement
 8 and look at paragraph 102, please, at page 38
 9 {SEA00014275/38}. You say there that:
 10 "100. On 23 January 2015 at 15:36, Kevin Lamb
 11 (Harley) copied me into an email to Simon Lawrence
 12 (Rydon) and said 'Please find attached revised typical
 13 windows showing reduced qty of trickle vents ...'"
 14 Do you see that?
 15 A. Yeah.
 16 Q. Then at 102 -- I'm so sorry, I actually read the wrong
 17 paragraph, it's a different email -- he says:
 18 "Please find attached specification on the upper 20
 19 floors for clarity/approval. We shall add to this as we
 20 reissue the lower elements."
 21 You see that?
 22 A. Yes.
 23 Q. You say there:
 24 "He attached the first version of a Harley Drawing
 25 C1059-100, titled 'Specifications' (the Harley

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1 Specification)."
 2 Okay?
 3 A. Yeah.
 4 Q. Then in paragraph 103 you say:
 5 "Harley prepared the Harley Specification to
 6 identify the materials it specified for the detailed
 7 design of the cladding system."
 8 Now, let's just have a look at the specification, if
 9 we can, please. This is {SEA00003059}, just to look at
 10 the version that was sent to you on 23 January 2015. If
 11 you can see the date at the bottom, it's dated
 12 15 January 2015, "Issued for approval", and if you look
 13 to the left, there is a box or set of boxes with
 14 revisions in it. There is no revision number in there,
 15 if you just move across to that. Then if you look at
 16 the top of the page, it says "Specification notes".
 17 Is that the document that he attached to the email
 18 of 23 January I referred to in your statement?
 19 A. It looks to be, yes.
 20 Q. Right.
 21 Now, if you go to paragraph 106 of your statement,
 22 which is on page 39 {SEA00014275/39}, you say:
 23 "On 26 January ... I emailed Harley regarding the
 24 three drawings they sent on 23 January, stating 'Please
 25 see attached comments'. I attached marked up drawings."

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1 Do you see that?
 2 A. Yes.
 3 Q. Can we take it from what you say there that you had read
 4 the specification that Mr Lamb had sent you on
 5 23 January and had commented on it? Do you remember
 6 that? We can look at a document in a moment but I just
 7 want to get your recollection first.
 8 A. I commented on it from the purposes of -- for the
 9 purposes of architectural intent, yes.
 10 Q. Okay, let's look at that. It is {SEA00003060}. On the
 11 first page of that, we can see the specification notes,
 12 very similar to what I've just shown you, but this time
 13 it's got a Studio E Architects red stamp on it and some
 14 red handwriting. I'm assuming that red handwriting is
 15 yours.
 16 A. Yes.
 17 Q. You can see that you have marked it B, so it conforms to
 18 design intent subject to comments. Do you see that?
 19 A. Mm-hm.
 20 Q. Now, have a look at it, up the page, please. Have
 21 a quick look at that -- or a slow look at it, doesn't
 22 matter. You can't see anywhere in there where the
 23 insulation for use within the overcladding system is
 24 specified, can we? We can't see that?
 25 A. No.

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1 Q. Did you notice that at the time?
 2 A. But the insulation had already been specified back in
 3 the 17th/18th correspondence.
 4 Q. Indeed, and that was my next question. Having spent
 5 two days engaged in discussions, 17 and
 6 18 September 2014, that we spent quite a lot of time on
 7 this morning and this afternoon, Mr Crawford, did it not
 8 surprise you to see that Harley's specification, when it
 9 came in January 2015, did not refer to the insulation
 10 for use within the overcladding system?
 11 A. Well, not necessarily, because it had been covered out
 12 in that previous correspondence. I mean, they might
 13 have added it into this sheet.
 14 Q. Yes, and they didn't, as we can see. My question is:
 15 did you notice that they hadn't?
 16 A. Well, I know I keep saying this, but I was commenting on
 17 this for the purposes of architectural intent.
 18 Q. I'll ask you one more time: when you received this
 19 document and you commented on it, did you notice the
 20 fact that the insulation type was not specified?
 21 A. I don't recall.
 22 Q. Right.
 23 Now, you made a comment in respect of the possible
 24 need for window restrictors. You can see that, "TBC by
 25 client"?

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1 A. Yeah.
 2 Q. You stamped the specification status B, "Conforms to
 3 design intent subject to incorporation of comments".
 4 On what basis were you satisfied that the
 5 specification conformed with design intent when there
 6 was no reference at all to the insulation for use in the
 7 cladding envelope?
 8 (Pause)
 9 A. Well, I suppose, as I said before, they had been covered
 10 separately, but I don't know if I did necessarily think
 11 about it in those terms on this sheet.
 12 Q. Was the omission of any material for insulation not
 13 a manifest error which any architect in your position
 14 should have picked up?
 15 A. Not necessarily, I mean, this specification sheet is not
 16 complete in any sense, it's not complete for the whole
 17 building. I mean, this was revised several times and
 18 it's extended to cover all the cladding across the
 19 building.
 20 Q. It was, and we'll look at some later editions of it.
 21 But at this point, having had two days of discussions on
 22 the insulation material, was it not manifest, and
 23 manifest to you and manifest to any architect on this
 24 type of project, that the insulation was missing?
 25 A. But it wasn't missing; it had been covered separately.

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1 Q. In an email, but not in a formal specification document
 2 such as this, which you had stamped.
 3 A. Yes, but is this a formal specification? It's not
 4 really; it's a sheet that relates to drawings.
 5 Q. Well, let's move on in time.
 6 If you go to the next edition of this, this is the
 7 one of 25 March 2015, it's {SEA00003180/1}.
 8 A. I mean, just to mention that even the title itself says
 9 "Specification notes".
 10 Q. What did you take from that at the time?
 11 A. Well, it's not the full specification, is it?
 12 Q. Did you think that at the time?
 13 A. Probably. I don't know. Possibly.
 14 Q. I'm wondering why you make the point, then. You say
 15 it's just notes.
 16 A. I'm making --
 17 Q. At the time -- let me just ask you. At the time,
 18 Mr Crawford, you saw the word "notes", did you think
 19 that there would be something else which would come from
 20 Harley which would more formally and completely set out
 21 what it was they had to do?
 22 A. I would read this, because of the title, saying
 23 "Specification notes", that it was specifically that:
 24 notes referring -- notes that were used against the
 25 drawing. So, for example, "Cladding - R2", so you take

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1 R2 and you relate it to what's in the drawing.
 2 Q. I see.
 3 A. So I suppose what I'm saying is it's not a complete
 4 specification in the sense that I think you're referring
 5 to.
 6 Q. Right. You say it's not complete. Again, we see there
 7 is no reference to the insulation for use within the
 8 overcladding system. But this time you have marked it
 9 with an A, "Conforms to design intent", and that's on
 10 27 March 2015, as we can see in the stamp.
 11 So question again: did you notice at the time that
 12 the specification for the insulation was missing from
 13 this document?
 14 A. I can't comment on that, but I would stand by my other
 15 comments, which is this sheet -- I wouldn't consider
 16 this sheet as a specification or a complete
 17 specification. I would consider this sheet as precisely
 18 what it says: specification notes, notes on
 19 specification to be read in conjunction with the
 20 drawings, as it was issued with and in conjunction with
 21 the drawings.
 22 Q. We will come to one or two drawings in a moment. Let's
 23 just complete the run.
 24 If you go to the final specification we have -- and
 25 there are one or two others in the intervening period,

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1 Mr Crawford, so forgive me if you want to go back to any
 2 of those, but this is {SEA00003387}, dated
 3 28 January 2016. We can see the date on that by looking
 4 at the box at the bottom. You can see the box at the
 5 bottom with the revisions going from A at the bottom to
 6 I at the top. You can see this is revision I,
 7 28 January 2016. Do you see that?
 8 A. Yes.
 9 Q. Then if we can just pan out a bit, we don't see a stamp
 10 from you on that, but I think you say in your statement
 11 that it was provided to you; can you confirm that?
 12 A. If that's what I said, then yeah, that would be the
 13 case.
 14 Q. Yes. Just for your note, you do, it's paragraph 136
 15 {SEA00014275/46}. We don't need to turn up it. Just to
 16 be clear, for your recollection, you say you didn't mark
 17 the status. You say you stamped it but didn't mark the
 18 status, but you intended to mark it status A "because
 19 I had no further comments to make".
 20 Now, can I just show you some drawings. In fact,
 21 actually it's easier to do this from your witness
 22 statement. If you go to paragraph 136, this is probably
 23 a quicker way of doing this. On page 46 of your
 24 statement, you can see there you refer to the Harley
 25 spec updated 28 January 2016, which is what we were just

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1 looking at, Mr Crawford, and you say:
 2 "On 28 January 2016, Kevin Lamb (Harley) copied me
 3 into an email to Stephen Blake (Rydon) and attached
 4 drawings for the internal atrium screen 'for final
 5 approvals '"
 6 Et cetera, et cetera.
 7 Then four lines up from the bottom of that paragraph
 8 you say:
 9 "I replied later that day, attaching marked up
 10 drawings, including revision I of the Harley
 11 Specification [which we have just seen], which I had
 12 stamped but did not mark Status, although believe I had
 13 intended to mark it Status A because I had no further
 14 comments to make."
 15 Now, if we look at {SEA00003387}, which is the
 16 document revision I to which you refer in paragraph 136,
 17 there is no stamp on that.
 18 Again, it's the same question. There is no
 19 reference in that document to the insulation for use in
 20 the building envelope. Take it from me that there
 21 isn't, even though the document has come on a long way
 22 since its version originally in January 2015.
 23 My question is: did you notice in January 2016 that
 24 the insulation for use in the building envelope was not
 25 specified?

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1 A. Comment is just the same as before.
 2 Q. Right. So is the answer: no, you didn't?
 3 A. As I said before, the insulation had been established
 4 within our spec and then the proposal for, if you like,
 5 the equivalent had been raised, which was the RS5000
 6 product.
 7 Q. Yes.
 8 A. Which they may or may not have believed to be
 9 essentially the same as the FR5000 product. And this
 10 sheet is not full specification, it's specification
 11 notes, nor is it clear to me whether Harley were ever
 12 required to produce a full specification or what the
 13 terms of that full specification were, for example, was
 14 it outline spec, spec notes.
 15 Q. Is there a reason why you never went back to Rydon or to
 16 Harley and said to them, "Look, I have had a whole load
 17 of these specification notes from you for about a year
 18 now, none of them refers to RS5000, can you please put
 19 that in?"
 20 A. No, it didn't occur to me to go back and ask them.
 21 Q. Given the importance of the insulation product and the
 22 questions that had arisen about it in the September of
 23 2014, my question is: why didn't it occur to you?
 24 A. Because it had already been established at 2014 what it
 25 was.

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1 Q. I see. So you were content at the time, were you, to
 2 leave this question of the identity of the insulation
 3 product as something contained in email traffic as
 4 opposed to going into a document which had been built up
 5 by a series of revisions, such as we see here?
 6 A. You say email traffic, but I think it was pretty
 7 explicit what it was, and also the checking was pretty
 8 explicit, so to me ...
 9 Q. If someone was coming into this project at this point
 10 from the outside, and had no idea about discussions or
 11 anything that had occurred, where would that person look
 12 to find out what specification or what product was to be
 13 used for the insulation at Grenfell Tower? What would
 14 they look at?
 15 A. Well, the data sheet that was provided by the specialist
 16 contractor.
 17 Q. What would tell them to look for that?
 18 A. All that information would be held together by Rydon.
 19 Q. I see.
 20 A. And ourselves for that matter.
 21 Q. Let me change tack slightly, a different product. I'm
 22 going to ask you one or two questions about Kingspan
 23 Kooltherm K15 because we mentioned it before.
 24 Were you familiar with that product, Kingspan
 25 Kooltherm K15, in July/August 2014?

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1 A. I knew of the product.
 2 Q. Did you know that it was a phenolic product?
 3 A. I possibly might have. I mean, I couldn't say
 4 definitively at this point.
 5 Q. Were you aware that Kingspan Kooltherm K15 had been used
 6 as an insulation product on Grenfell Tower?
 7 A. No.
 8 Q. Okay. Can you remember when you first became aware of
 9 that?
 10 A. After the fire.
 11 Q. After the fire.
 12 I'm going to turn to ACM in a moment. Before I do,
 13 I have just one or two questions left on insulation on
 14 the KALC project.
 15 Now, Studio E, as you have told us, were the
 16 architect on the KALC project, and specifically the
 17 Kensington Aldridge Academy; yes?
 18 A. Yes.
 19 Q. Were you involved in the design of the façade for the
 20 Kensington Aldridge Academy?
 21 A. At a -- there was a senior architect working on that who
 22 did the bulk of the work on that.
 23 Q. Senior architect at Studio E?
 24 A. Yes.
 25 Q. Who was that?

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1 A. Markus Kiefer.
 2 Q. Markus Kiefer, I see.
 3 A. And also ... I forget the name of the individual who did
 4 the GA drawings for the façades.
 5 Lucas, Lucas Brandes.
 6 Q. Were you involved in the selection of the materials that
 7 formed the cladding system on the building?
 8 A. Was I aware of ... I didn't do the specification, no.
 9 Q. You didn't do the specification?
 10 A. No.
 11 Q. Can you assist us -- and maybe you can't -- with what
 12 the façade on the Kensington Aldridge Academy is
 13 comprised of?
 14 A. A large chunk of it is a stick system, curtain walling
 15 system, Schüco-type curtain walling system that was --
 16 the main contractor was MTW for that. There were
 17 portions of brickwork at the lower levels, and with
 18 windows inset into those, and a small amount of curtain
 19 walling around the sports hall -- small amount of
 20 rainscreen walling around the sports hall.
 21 Q. I see, okay. Was there any insulation used in the
 22 cladding system?
 23 A. In the main cladding system, in the curtain walling, was
 24 Rockwool.
 25 Q. Okay, and Rockwool is, for those who perhaps don't know,

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1 non-combustible, isn't it? It's a mineral.
 2 A. Yes.
 3 Q. To all intents and purposes, non-combustible.
 4 A. Yes, all intents and purposes --
 5 Q. Do you know why a non-combustible mineral insulation
 6 came to be used on the Kensington Aldridge Academy, not
 7 least given that it was not a building in excess of
 8 18 metres in height?
 9 A. Well, there wasn't just Rockwool used in the Kensington
 10 Academy.
 11 Q. What else was there?
 12 A. I believe there is phenolic and PIR within the brick
 13 construction.
 14 Q. Right.
 15 One of the questions is whether the choice of the
 16 use of non-combustible mineral insulation was related to
 17 the choice to use ACM panels on that building.
 18 A. Sorry, what? Say that again?
 19 Q. Yes. Was the choice of mineral wool as the insulation
 20 material related in any way to the choice to use ACM
 21 panels on that building?
 22 A. ACM panels weren't used on that building.
 23 Q. Well, they had a combustible styrofoam insulation. Does
 24 that not ring a bell with you?
 25 A. Which building are you talking about here, KALC?

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1 Q. Yes. KAA.
 2 A. I wasn't aware of that.
 3 Q. Okay. Well, I could take this shortly: were you aware
 4 of what the composite elements of the cladding system
 5 were at KAA?
 6 A. I wouldn't be without checking, no.
 7 Q. Perhaps I can show you a document. I didn't mean to
 8 take time up on this. {RBK00029935/4}.
 9 This is the executive summary, and I'll just tell
 10 you what this document is. This is a fire safety review
 11 done by FDS Consult in June 2018 for the Kensington
 12 Aldridge Academy.
 13 If you go to page 4 under the executive summary, you
 14 can see that under the first bullet point it says:
 15 "The external walls of the KAA building are covered
 16 with aluminium composite material (ACM) panels which
 17 have a core of combustible Styrofoam insulation. The
 18 type of ACM panel used on KAA is different to that used
 19 on Grenfell Tower and, except for a few small isolated
 20 areas, is backed up with non-combustible mineral
 21 insulation."
 22 Now, that's what it says there.
 23 First of all, did you know that? Is that something
 24 you're familiar with?
 25 A. I wouldn't have been without checking, no.

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1 Q. Without checking, what, some underlying --
 2 A. Spec.
 3 Q. I see, okay.
 4 Can you help me, then, just with one question: was
 5 the choice to use a non-combustible mineral insulation
 6 related to the choice to use ACM panels with
 7 a combustible core?
 8 A. I couldn't say.
 9 MR MILLETT: All right.
 10 Mr Chairman, we're going to come next to a different
 11 topic. We have been going 55 minutes. It may be
 12 appropriate now to take a break.
 13 SIR MARTIN MOORE-BICK: Yes. How long is the next topic
 14 likely to take?
 15 MR MILLETT: The next topic is likely to take about
 16 three-quarters of an hour.
 17 SIR MARTIN MOORE-BICK: In that case, perhaps we should take
 18 a break.
 19 MR MILLETT: Maybe half an hour.
 20 SIR MARTIN MOORE-BICK: We will stop now for ten minutes and
 21 come back at 3.05, please. Would you like to go with
 22 the usher.
 23 (Pause)
 24 Right, 3.05, please.
 25 MR MILLETT: Thank you.

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1 (2.55 pm)
2 (A short break)
3 (3.05 pm)
4 SIR MARTIN MOORE-BICK: All right?
5 THE WITNESS: Yeah.
6 SIR MARTIN MOORE-BICK: Good, thank you.
7 Yes, Mr Millett.
8 MR MILLETT: Mr Crawford, we are now going to turn to
9 a different topic, namely ACM. All right? So we have
10 put insulation aside now.
11 At the time of working on the Grenfell project,
12 indeed at any time you were involved in it, were you
13 aware of previous fires involving external cladding
14 façades on high-rise residential buildings?
15 A. No.
16 Q. So you weren't aware of a fire in 1991 at
17 Knowsley Heights, or 1999, Garnock Court in Scotland?
18 A. No.
19 Q. Were you aware of the Lakanal House fire in Southwark in
20 2009?
21 A. Lakanal House fire?
22 Q. Yes.
23 A. I had heard the name but I wasn't aware that it was
24 connected to a fire -- specific fire.
25 Q. Right. So what about fires in the UAE or Dubai in 2012

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1 to 2013 and 2015?
2 A. No.
3 Q. No? Right.
4 Can I ask you to go to your witness statement,
5 please, paragraph 53, which is at page 23
6 {SEA00014275/23}. You say there:
7 "I was not involved in the development of the
8 cladding design prior to Rydon's appointment, however,
9 I understand that Bruce Sounes (Studio E) addresses this
10 aspect of the design in detail in his witness
11 statement."
12 Now, that's what you say there.
13 By July 2014, so when you started to work on the
14 Grenfell Tower project, or perhaps August, do you
15 remember that Bruce Sounes had just submitted
16 an application to the RBKC planning department for their
17 approval of face-fixed ACM panels?
18 Just to be clear, when I say Bruce Sounes,
19 I actually mean through IBI Taylor Young, the planning
20 consultants. Did you know that at the time?
21 A. I was aware that a mock-up had been done as part of
22 discharging that issue, I think.
23 Q. Right, okay. Let's look at a document. If you can go
24 to {RYD00010789}, please.
25 This is a document from IBI Taylor Young to

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1 Sarah Scanell at planning at RBKC, dated 29 June 2014.
2 It's entitled, "Grenfell Tower, planning application
3 reference ... discharge of conditions 3 and 4", and
4 there are some details there. This is just the first
5 page of it.
6 Do you remember looking at this document or seeing
7 it as part of your handover or preparation for coming
8 into the project?
9 A. I don't specifically recall, but it doesn't mean that
10 I didn't.
11 Q. All right.
12 Can you turn, please, to page 2 {RYD00010789/2} of
13 this document. You can see under paragraph 3:
14 "Rainscreen: Aluminium Composite Material (ACM).
15 "Brushed Aluminium ..."
16 Then there is an email address Alcoa, otherwise
17 known as Arconic, and then, "Stainless Steel Rivets".
18 Under 5, "Aluminium rainscreen cassette". That's
19 a different part of the building.
20 Do you remember seeing a document like this which
21 contained that specification in it?
22 A. No.
23 Q. Did you have any discussion with Bruce Sounes -- leave
24 aside this document -- when you came into the project
25 about what the rainscreen should consist of?

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1 A. I think it's inevitable that there would have been some
2 sort of discussion, but I can't remember specifics.
3 Q. Do we take it from that that therefore you did not have
4 any involvement in the decision to change from a zinc
5 rainscreen to an aluminium composite?
6 A. I didn't have any involvement, no.
7 Q. Right.
8 Did you yourself ever take any steps to consider for
9 yourself whether ACM was a suitable material for the
10 purposes of compliance with part B4 of the Building
11 Regulations?
12 A. My knowledge of ACM is that, I suppose, it had been
13 around for a while, widely used. I didn't view it as
14 any different from a standard aluminium panel.
15 Q. So is the answer to my question no, but that's because
16 it was widely used and no different from a standard
17 aluminium panel? Well, we will come to that.
18 A. I had no concept that it was any different from
19 a standard aluminium panel.
20 Q. What do you mean by a standard aluminium panel?
21 A. Normally rainscreen -- let's say, for example, the
22 rainscreen put up on KAA, round the sports hall -- is
23 usually a sort of 1.2/2-mil thick aluminium pressed
24 panel.
25 Q. With or without a core?

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1 A. Without a core.
 2 Q. Without a core?
 3 A. Yes.
 4 Q. I see. Just so I understand your evidence, you didn't
 5 think that an ACM, an aluminium composite material, was
 6 different from an aluminium panel without a core?
 7 A. Correct. I just thought it was a thin laminated panel,
 8 basically.
 9 Q. I see. So do we take it from that that you never took
 10 any steps to investigate whether ACM -- which of course,
 11 by definition, has a composite core or is a composite
 12 material with a core -- was different from what you call
 13 a standard panel?
 14 A. Not that I recall.
 15 Q. Right.
 16 Did you investigate what fire classification the ACM
 17 proposed for Grenfell had?
 18 A. I don't specifically remember doing so, but I know we
 19 had the BBA certificate on file, and if I had done and
 20 looked at it, I would have understood it as compliant on
 21 the basis of being national class 0.
 22 Q. Right, that takes me to the next question.
 23 You say you had the BBA certificate on file. Do you
 24 remember when you first saw the BBA certificate?
 25 A. Well, it was obviously pulled out after the event, but

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1 whether I looked at it before then, I couldn't
 2 definitively say.
 3 Q. Did you look at the BBA certificate when you came into
 4 the project or at any time thereafter? Just to be
 5 clear, this is the BBA certificate for the Reynobond
 6 PE 55.
 7 A. Yeah, I couldn't recall definitively.
 8 Q. You couldn't recall definitively. Let's --
 9 A. Or I can't -- I just say I can't recall. The reason
 10 I say that is obviously Bruce introduced the project and
 11 showed me things. He may or may not have shown me that
 12 as part of showing the information, but I just don't
 13 recall.
 14 Q. Okay.
 15 At the point of coming into the project, am I right
 16 in thinking that you had never yourself used ACM on any
 17 of your projects?
 18 A. As far as I'm aware, I have never personally specified
 19 or used them.
 20 Q. So doing the best you can with your recollection, would
 21 you have, do you think, been interested to look at the
 22 BBA certificate, given that this was a product which was
 23 new to you?
 24 A. Possibly, except my understanding -- possibly if my
 25 understanding was that it was something different than

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1 just a normal aluminium panel.
 2 Q. Let's look at the certificate itself. This is at
 3 {SEA00000516}. We will see if it jogs a recollection.
 4 I should just say, Mr Crawford, what I don't want to
 5 do is to show you this document and ask you questions
 6 about it if you don't have any recollection of seeing it
 7 at the time. So I'm not using this exercise as
 8 an opportunity for you to make points about the
 9 document, I just want to get your recollection of your
 10 thoughts at the time. If you didn't read it or didn't
 11 think about it then we will move on.
 12 If you go, please, to the first page of this, you
 13 can see this is the BBA certificate, and it has a sort
 14 of red, white and blue triangle at the top and a picture
 15 of a building.
 16 Does that look familiar to you?
 17 A. It's familiar to me, but only because of -- it's been
 18 looked at post-event.
 19 Q. I see. So you don't recall seeing something like that
 20 at the time --
 21 A. I don't, no.
 22 Q. -- when you had a handover with Bruce Sounes? Right,
 23 okay. In which case, if that doesn't jog your
 24 recollection of seeing it at the time, I won't ask you
 25 about it.

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1 Let's go to {SEA00013049}. This is an email
 2 exchange between you and Mr Ashton of Exova in
 3 March 2015, and this is on 31 March, and it's part of
 4 a longer chain of emails that we're going to come back
 5 to later in your evidence, but I just want to ask you to
 6 look at page 1 and the second email down on that page.
 7 Do you see that? It's an email where Mr Ashton writes
 8 to you at 13.32 on that day, and the context of this, so
 9 that I can just explain it to you, is the fire
 10 resistance of the cavity barriers and/or firestops, and
 11 the title to the email, as you can see, is
 12 "Grenfell Tower Fire Stopping".
 13 I don't want to ask you about that precise topic at
 14 the moment, because we will come back to it, but if you
 15 look at Mr Ashton's email to you at 13.32, he says:
 16 "Neil
 17 "This isn't something that would necessarily form
 18 part of a fire safety strategy for a building.
 19 Therefore, it would not have been dealt with in the fire
 20 safety strategy for this buildings. I agree with Ben
 21 Kay."
 22 That's a reference to someone called Ricky Kay at
 23 Siderise, we will come back to him later:
 24 "I believe that a cavity barrier is all that is
 25 required in this application. Even if we were to agree

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1 with RBKC, it is difficult to see how a fire-stop would
2 stay in place in the event of a fire where external
3 flaming occurred as this would cause the zinc cladding
4 to fail.

5 "Kind regards

6 "Terry."

7 I have read that to you because I want to show you
8 your response, and that's what I want to ask you about.

9 At the top of this chain you reply to Mr Ashton at
10 14.12 on that day and you say in the first line:

11 "... metal cladding always burns and falls off,
12 hence fire stopping is usually just to the back of the
13 cladding line. Thanks for this confirmation anyway."

14 Now, I just want to focus on the words "metal
15 cladding always burns and falls off".

16 Were you saying there that there was no point in
17 installing cavity barriers behind the ACM rainscreen
18 because in the event of an external fire, there would be
19 nothing to hold them in place to seal the cavity?

20 A. Firestopping, you mean?

21 Q. Well --

22 A. That's specifically what that's referring to, holding
23 firestopping in place if it fell off. A cavity barrier
24 would be kept in place.

25 Q. Right. Then your words, "metal cladding always burns

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1 and falls off", looking at that, was that your
2 experience?

3 A. I think I've detailed that within my witness statement.

4 Q. You have, and I will come to that. Just before we get
5 to that --

6 A. It's a poor choice of words, it should have been "melts
7 and fails and falls off", but that was my experience,
8 and the reference specifically was to previous projects
9 where I had been working within -- the best way to
10 explain it is within a building you have compartments
11 and you have the façade, which can be anything from
12 curtain walling or brick, whatever it is, but the
13 compartment which, you know, in this case would be
14 an apartment, you have compartment walls that are lines
15 of fire resistance, and the external wall, it generally
16 isn't a line of fire resistance unless you have
17 a boundary issue.

18 So what happens in -- if you have a developed fire
19 scenario, then the compartment itself is protected but
20 the façade will fail or buckle, melt, fall off, and the
21 specific reference I made in my witness statement was
22 where I had been working on a project and it was made
23 clear to me that that's what happens.

24 I think sometimes it's misconstrued. People think
25 there is a requirement for some level of fire resistance

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1 on the external wall, and there isn't. Basically, in
2 a fire scenario, they fail, except where you have the
3 relative boundary issue.

4 So, yeah, that's --

5 Q. That's your understanding.

6 You have said in your statement that your comment
7 here was based on advice that was given to you by a fire
8 engineer on a project in Manchester in 2004.

9 A. Yeah.

10 Q. That's right, is it?

11 A. Yes. I mean, I remembered that specifically because
12 I remember sitting in the upstairs in the pavilion and
13 he had got a bit exasperated with me because it was
14 an office building and he was trying to -- we had
15 a boundary issue, a very close boundary issue. It just
16 failed. And if you think of a typical office block
17 where you have aluminium curtain walling and glass, the
18 glass will pop, the aluminium will melt, the brackets
19 holding it will melt, they'll fail, and so it basically
20 just collapses in a fire scenario.

21 Q. Right.

22 A. I mean, there's ways to deal with that. You see in some
23 of the office buildings around the city, if you do have
24 a proximity issue, you can use local dousing systems and
25 so on. But basically it's this notion that there is no

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1 fire resistance within the external wall generally.

2 Q. I see. Does it follow from that that, although you made
3 this remark in March 2015, the fact that metal cladding
4 burns or, as you would say, perhaps melts and falls off
5 was something that you had known since the start of your
6 involvement on the Grenfell project?

7 A. Metal cladding melts and fails in a developed fire
8 scenario, yes.

9 Q. So you had always known that, is my question?

10 A. Yes.

11 Q. Yes, I see.

12 Was it ever drawn to your attention by anybody that
13 composite rainscreen material like ACM, which has
14 a polyethylene core, can contribute to external
15 flame spread?

16 A. No.

17 Q. Do you agree that if rainscreen products burn or melt,
18 then they don't adequately resist spread of fire over
19 the external walls?

20 A. I can see what you're referencing, but I don't think you
21 can say that, because then you would have to say
22 effectively every glass and aluminium tower in the city
23 was non-compliant.

24 Q. Well, you might or might not say that, that is as it may
25 be, but do you agree that if a rainscreen product burns

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1 or melts in the way that you are referring to here in
 2 this email, then it does not adequately resist the
 3 spread of fire over the external wall?
 4 A. No, it does adequately resist the spread of fire across
 5 the external wall as defined in B4.
 6 Q. Now, you say that now; is that something that you
 7 actually turned your mind to at the time? When I say at
 8 the time, to be specific --
 9 A. Yes.
 10 Q. -- in and from July/August 2014.
 11 A. Well, yes. Let's say the product is -- to be compliant
 12 would have to have national class 0. If it had
 13 national class 0 then it was meeting that requirement.
 14 Q. Even though it always burns and falls off?
 15 A. In a developed fire ...
 16 Q. Well, you --
 17 A. It will eventually melt and fail. It will fail and
 18 melt.
 19 Q. I'm just struggling to see, if it will eventually fail
 20 and melt, then how could it adequately resist the spread
 21 of fire over the external wall?
 22 A. Because it meets the requirement within -- I mean, the
 23 kind of question you're asking is a bit like saying, to
 24 meet that requirement, every external wall would have to
 25 have a fire resistance, and they don't. They're only

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1 required to meet the standard set out in B4, which it
 2 does.
 3 Q. Did you ever raise with anybody, whether Harley or Rydon
 4 or within Studio E, your experience, as identified in
 5 this email, that metal cladding always burns and falls
 6 off, or as you would say melts and falls off?
 7 A. Yes.
 8 Q. Who and when?
 9 A. Fails and melts, yes.
 10 Q. Who did you raise that with?
 11 A. Sorry, did I raise it --
 12 Q. Yes, my question was: did you ever raise with anybody,
 13 whether Harley or Rydon or within Studio E, your
 14 experience, as identified in this email, that metal
 15 cladding always burns or melts and falls off?
 16 A. I think it's self-evident. I think most people in the
 17 industry would realise that an aluminium panel at some
 18 point would fail. Aluminium I think melts at about
 19 650 degrees. It isn't instantaneous, but it will fail,
 20 the same way glass will fail. Well, glass will fail
 21 long before the aluminium, but ultimately it fails and
 22 ultimately it melts.
 23 SIR MARTIN MOORE-BICK: I am a little concerned that we may
 24 be slightly at cross-purposes here.
 25 If you envisage a fire in a compartment in any

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1 building, let's say a tall building, your understanding
 2 is that a metal cladding will fail in way of the fire;
 3 is that what you are saying? Or that the fire will
 4 propagate across the cladding to other storeys and other
 5 parts of the building? Because it seems to me there is
 6 a distinction there which we need to understand.
 7 A. I see what you're saying. No, it will fail where -- it
 8 will ultimately melt and fail where it's exposed. It
 9 wouldn't actively propagate it, no. I mean, that
 10 propagation would be tested by the -- being compliant to
 11 the national class, for example, being --
 12 SIR MARTIN MOORE-BICK: So the failure of the cladding, as
 13 you understood it, will depend on the temperature
 14 reached by the fire behind it?
 15 A. Yes.
 16 SIR MARTIN MOORE-BICK: But the sort of cladding you have in
 17 mind, I think, you would not expect to support
 18 combustion itself?
 19 A. Correct.
 20 SIR MARTIN MOORE-BICK: Right.
 21 Thank you.
 22 MR MILLETT: Now, looking back at this email, as we can see
 23 from the second email down from the top of this page,
 24 which is from Terry Ashton to you, Mr Crawford,
 25 31 March, you can see in the last sentence that

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1 Mr Ashton refers to zinc cladding; do you see?
 2 A. Yes.
 3 Q. Did you spot, when you received this email from
 4 Mr Ashton, that he was referring to zinc cladding?
 5 A. I think I actually sent him an email afterwards and
 6 corrected him and said it was ACM.
 7 Q. We may need to look at that, but were you surprised that
 8 Mr Ashton still thought that the cladding was zinc at
 9 this stage?
 10 A. I don't know. I mean, the VMZinc that was shown in the
 11 drawings that I sent to him was effectively the same as
 12 ACM.
 13 Q. We had seen some of the drawings earlier on. Did it
 14 occur to you that Mr Ashton had got the notion that the
 15 cladding was zinc from the section drawings that Harley
 16 had sent you and you had sent to Mr Ashton in
 17 September 2014 that we looked at earlier today?
 18 A. It's possible he was referencing something historic,
 19 yes.
 20 Q. Now, we are at the end of March 2015 here. Did you
 21 realise that construction had started at this point and
 22 in fact was reasonably well advanced?
 23 A. Construction generally or in the cladding?
 24 Q. Construction -- well, on the cladding system, in fact,
 25 yes.

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1 A. I think the mast climbers were up.
 2 Q. Yes.
 3 A. I couldn't say definitively --
 4 Q. At this stage, did you think to yourself that you should
 5 check where Exova had got to with the promised analysis
 6 of external fire spread as a result of the proposed
 7 overcladding?
 8 A. No. I think as I stated earlier, my understanding was
 9 that they understood what was proposed and they formed
 10 the opinion that it was compliant, and I saw no reason
 11 to go beyond that.
 12 Q. You now at this point had, on any view, clarity about
 13 what precise product was being used in the rainscreen,
 14 namely Reynobond PE 55 ACM.
 15 A. Yeah.
 16 Q. Did it occur to you at this stage at the latest to go
 17 back to Exova and say, "Now you know what the insulation
 18 is, now you know what the rainscreen material is going
 19 to be, can we please have your analysis of the effect of
 20 these materials on external fire spread?"
 21 A. I don't recall. I don't recall.
 22 Q. You don't recall? We know that you didn't, and
 23 I suppose my question is: why didn't you?
 24 A. Well, I think I corrected him on the zinc and said that
 25 it was ACM, and my understanding was that he was happy

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1 that what we had proposed was compliant, from before.
 2 Q. We don't --
 3 A. With regard to the specifics of the question and the
 4 report, no, I didn't think about the report.
 5 Q. We know from the previous report that Exova had said in
 6 issue 3 of the OFSS, the outline fire safety strategy,
 7 that there would be no adverse effect on external fire
 8 spread but that would be subject to a confirmation by
 9 an analysis in a future report.
 10 Was this not the moment to ask Mr Ashton to update
 11 Exova's analysis based on the use of ACM, given at least
 12 the change in the material to ACM and the fact that you
 13 knew that it would burn in a fire, or melt?
 14 A. I thought he knew about the ACM from before.
 15 (Pause)
 16 Q. Yes, but you had not had the promised report from him,
 17 so I'll just ask my question perhaps one more time and
 18 in a slightly different way.
 19 Was now not the time at last to go back to Exova and
 20 say, "Look, you promised a confirmation in a future
 21 report, now you know what materials we're using, can we
 22 please have it?"
 23 A. It could have been, yes.
 24 Q. So why didn't you?
 25 A. Because I understood that he understood that what we

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1 were doing was compliant.
 2 Q. But you hadn't had that in a formal written report
 3 signed by Exova, had you?
 4 A. No.
 5 Q. So was that not something that you, as a conscientious
 6 architect, would have wanted to have had from them with
 7 a signature for the file, not least because they had
 8 promised it?
 9 A. Well, I suppose I may have still been expecting it.
 10 Q. Well, if you were expecting it, why didn't you pursue
 11 it?
 12 A. Well, I can't recall whether I did or not.
 13 Q. Well, we can't see any documents which show that you
 14 did.
 15 A. No, what you're saying is you can't see the final
 16 report. That doesn't mean that I didn't ask for it or
 17 ask for it repeatedly, or they didn't intend to produce
 18 it and not produce it. All that means is they didn't
 19 ultimately produce it.
 20 Q. Yes, and my question is --
 21 A. I understand your question. Your question is: did I ask
 22 them categorically at that time? And I've told you
 23 I don't recall.
 24 MR MILLETT: Right.
 25 Cavity barriers. I'm going to ask you some

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1 questions about the design of cavity barriers in the
 2 façade. We have looked at this a little bit before in
 3 some of the questions on the email strings that we've
 4 seen.
 5 Mr Chairman, this is a short topic, but if we're
 6 going to get a second break this afternoon, perhaps now
 7 is the time to have it, or I can cover it off and then
 8 we can move on to the next topic.
 9 SIR MARTIN MOORE-BICK: You have quite a few more questions?
 10 MR MILLETT: Oh, yes, many more, but not on this specific
 11 topic. It's probably more sensible if we break now.
 12 SIR MARTIN MOORE-BICK: Do you feel you need another break
 13 now, Mr Crawford?
 14 A. It's probably a logical point, isn't it?
 15 SIR MARTIN MOORE-BICK: It's a matter for you whether you
 16 feel you need a break or not.
 17 A. Yeah, I will take a break.
 18 SIR MARTIN MOORE-BICK: Yes.
 19 Before you do, can I just ask you a question arising
 20 out of Mr Millett's questions on ACM panels.
 21 You have described to us what you knew about
 22 aluminium panels and their behaviour in fire. Did you
 23 have the same or a different view about ACM, which had
 24 a polyethylene core?
 25 A. No, I mean, I just viewed it as a laminated aluminium

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1 panel. I didn't --
 2 SIR MARTIN MOORE-BICK: So the fact that the core was
 3 polyethylene didn't cause you to consider how it might
 4 behave?
 5 (Pause)
 6 A. I mean, as I understand it, Reynobond only had -- they
 7 only marketed the one product. I mean, my knowledge of
 8 polyethylene ... did I even know it was polyethylene, or
 9 is it ... I didn't -- I didn't -- I just viewed it as
 10 a laminated aluminium panel. I didn't have any
 11 perception that it was ... well, the sort of monster
 12 that it's become, I mean ...
 13 SIR MARTIN MOORE-BICK: That's all right.
 14 A. Yeah.
 15 SIR MARTIN MOORE-BICK: Good, thank you very much. We will
 16 have ten minutes now. Back at 3.45, then, please.
 17 THE WITNESS: Yes.
 18 SIR MARTIN MOORE-BICK: Thank you very much.
 19 (Pause)
 20 3.45, please. Thank you.
 21 (3.35 pm)
 22 (A short break)
 23 (3.45 pm)
 24 SIR MARTIN MOORE-BICK: All right, Mr Crawford?
 25 THE WITNESS: Yes.

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1 SIR MARTIN MOORE-BICK: Good, thank you.
 2 MR MILLETT: Mr Crawford, I'm going to ask you some
 3 questions about the design of the cavity barriers in the
 4 façade.
 5 Can I ask you to go back to the Building
 6 Regulations, please, {CLG00000224/69}.
 7 This is schedule 1, part B3, "Internal fire spread
 8 (structure)".
 9 If you look at subsection (4), please, at the
 10 bottom, it says:
 11 "The building shall be designed and constructed so
 12 that the unseen spread of fire and smoke within
 13 concealed spaces in its structure and fabric is
 14 inhibited."
 15 Do you see that?
 16 A. Yes.
 17 Q. Were you aware of that requirement when you were working
 18 on the Grenfell Tower project?
 19 A. I was aware of B3, yes.
 20 Q. Yes, including subsection (4)?
 21 A. Categorically, verbatim --
 22 Q. Not necessarily verbatim, but --
 23 A. The concept generally, yes.
 24 Q. Yes. If we look at the guidance for that in ADB,
 25 {CLG00000224/82}. This is paragraph 9.1,

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1 "Introduction", and it says:
 2 "Concealed spaces or cavities in the construction of
 3 a building provide a ready route for smoke and flame
 4 spread. This is particularly so in the case of voids
 5 in, above and below the construction of a building, eg
 6 walls, floors, ceilings and roofs. As any spread is
 7 concealed, it presents a greater danger than would a
 8 more obvious weakness in the fabric of the building."
 9 Were you aware of the guidance in ADB, Mr Crawford,
 10 on cavities at the time when you became involved in the
 11 Grenfell Tower project?
 12 A. Yes, I was aware of diagram 33 in section 9, yes.
 13 Q. Did you appreciate that the construction of the new
 14 façade on Grenfell Tower would create cavities?
 15 A. Yes.
 16 Q. Did you appreciate that there was a risk of fire spread
 17 within those cavities?
 18 A. Yes.
 19 Q. Looking at paragraph 9.2, "Provision of cavity
 20 barriers", it says there that cavity barriers should be
 21 provided, and there is quite a lot of text below that,
 22 but can I summarise it: to subdivide the cavity where
 23 there would otherwise be a pathway around a fire
 24 separating element, ie compartment walls and floors;
 25 yes?

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1 A. Yes.
 2 Q. Closing the edges of cavities; yes?
 3 A. Yes.
 4 Q. Subdividing extensive cavities.
 5 A. Yes.
 6 Q. And protecting openings within extensive cavities,
 7 for example around window.
 8 A. Yes.
 9 Q. You can see diagram 33 where that's illustrated. Can
 10 you please be shown diagram 33 at the bottom. This is
 11 called "Provisions for cavity barriers". It's still
 12 page 82. You can see, just working from the top of the
 13 building in the diagram downwards, one can see that one
 14 is supposed to put cavity barriers at the top of the
 15 cavity; do you see that?
 16 A. Yes.
 17 Q. And within the cavity at the compartment floor line; do
 18 you see that?
 19 A. Yes.
 20 Q. Second one down. Then third one down, around openings.
 21 You can see the two little arrows. Do you see that?
 22 A. Yes.
 23 Q. That's a window, isn't it?
 24 A. Yes.
 25 Q. So the little green box also shows you where you have to

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1 put a firestop .
 2 A. Yes.
 3 Q. And that's got to be the same fire resistance as the
 4 compartment.
 5 A. Yes.
 6 Q. We will come back to that later when we look at the
 7 design of the cavity barriers , but before we do, can we
 8 go to 9.3, which is on page 83 {CLG00000224/83}, the
 9 next page in the guidance. That says that -- and it's
 10 again quite a long bit of text:
 11 "Cavity barriers should be provided to close the
 12 edges of cavities , including around openings."
 13 A. Yes.
 14 Q. You see that in the first part of 9.3.
 15 Do you agree that the guidance is clear that you
 16 need cavity barriers around openings?
 17 A. I would make several observations -- you have to bear
 18 with me a bit while I do this -- on section 9 and
 19 diagram 33.
 20 The basis of the Building Regulations, as
 21 I understand it, the original conception with the DCLG
 22 is they were based largely or created largely for
 23 designing sort of generic, if you like, Wimpey type
 24 houses in housing estates, and section 33, in my
 25 experience over time -- sorry, diagram 33 in section 9,

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1 in my experience over time, is that it's not fit for
 2 purpose. There's reasons I have to believe that, and
 3 they've informed how I apply cavity barriers over time.
 4 There are a number of observations I would make.
 5 First of all, architects are visual. 90% of our time is
 6 spent drawing and working 3D sketching and so on.
 7 Diagram 33 itself looks like a two-up, two-down house.
 8 If you look at the silhouette of it, it looks like two
 9 brick skin walls together. Actually, the revised
 10 version, the 2019 version, is even worse, because they
 11 slap a basement on it, so it doesn't give any sense
 12 because it's for any building of any height. And my
 13 experience when you actually read through section 9 is
 14 that it's very limited. It doesn't make any reference,
 15 for example, to double-skinned façades, to overcladding
 16 or to rainscreen façades, and I have had the personal
 17 experience before in other projects, specifically
 18 double-skinned façades, where they typically don't use
 19 cavity barriers at all or very limited.
 20 So you have to assess based on the specifics of your
 21 building type, which in my view are not covered by the
 22 guidance -- and bearing in mind that it is just
 23 guidance -- and no amount of -- well, you could spend
 24 dozens of hours reading the text and trying to interpret
 25 the language in that section, but it doesn't make up for

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1 lack of experience in terms of practical application,
 2 and I'm mentioning that specifically to experience
 3 I have had doing double-skinned façades, which don't
 4 allow you to put in cavity barriers in the way that is
 5 shown, for example, in diagram 33.
 6 Q. Well, go, please, to this same document, actually,
 7 page 96 {CLG00000224/96}, which is the guidance under
 8 B4, external wall construction, Mr Crawford, and I would
 9 like you, please, to look at paragraph 12.8.
 10 A. Yeah.
 11 Q. Now, we have seen 12.7. We spent a lot of time on that.
 12 I'm now looking at 12.8 under "Cavity barriers", which
 13 we looked at briefly on Thursday --
 14 A. Which references 9, yeah.
 15 Q. Correct, it does.
 16 So had you looked at that at the time, you would
 17 have understood, surely, that cavity barriers should be
 18 provided in accordance with section 9 in respect of
 19 Grenfell Tower; no?
 20 A. No. I mean, if you read the actual text, you can't
 21 even -- you can't satisfy section 9. I mean, you can't,
 22 for example, close around all openings in a rainscreen
 23 façade. The way a rainscreen façade works is it's
 24 effectively open, so it's ventilated, so you have --
 25 it's pressure equalised. The theory behind that is that

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1 the pressure behind the rainscreen is the same on the
 2 front or it equalises. In order to do that, every panel
 3 is open round the edge. If you were to take verbatim
 4 section 9, you would have to seal round every edge. So
 5 you can't satisfy ADB2 by following section 9.
 6 Q. I'm just trying to understand your recollection at the
 7 time. Was it your recollection at the time --
 8 A. That's my recollection at the time.
 9 Q. Wait a minute. Was it your recollection at the time
 10 that Approved Document B, even though it refers to
 11 cavity barriers at 12.8, in accordance with section 9,
 12 didn't require cavity barriers round the windows at
 13 Grenfell Tower?
 14 A. Sorry, can you say that again?
 15 Q. Yes. Was it your understanding of Approved Document B
 16 at the time that, notwithstanding the language of 12.8
 17 of Approved Document B, which refers in terms to
 18 section 9, cavity barriers were not required around the
 19 windows in the external wall construction at
 20 Grenfell Tower?
 21 A. If you were to follow section 9 in part you might assume
 22 that they were required.
 23 Q. Did anything about the project lead you to think that
 24 cavity barriers were not required around the windows?
 25 A. I think there's practical issues with rainscreen façades

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1 where you can't satisfy section 9 by placing cavity
2 barriers to close the edges around windows. Most
3 proprietary rainscreen systems, all the bracketry is
4 right up at the edge, so you can't -- if you look at
5 product literature on most rainscreen systems, you can't
6 get a cavity barrier closing the edge.

7 Q. It --

8 A. So my understanding in terms of the strategy, cavity
9 barrier strategy on Grenfell, was that there was
10 a scheme that had been agreed and agreed, like I say,
11 compliant for the employer's requirements. I then took
12 that and tried to verify it with Exova, with my
13 understanding of what would be a compliant scheme, and,
14 well, they agreed.

15 Q. We will come to the email correspondence in due course.
16 I'm just trying to understand at the moment your
17 evidence about your thinking at the time of how the
18 rainscreen system proposed for Grenfell would comply
19 with the requirements of Approved Document B,
20 paragraph 12.8 and section 9.

21 Again, I'm just trying to summarise your evidence:
22 are you telling us that in fact it wasn't possible, in
23 your opinion at the time, to construct the rainscreen
24 cladding in such a way that it did comply?

25 A. Not to ADB2, but that's only a guidance.

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1 Q. Did you raise that concern or question with anybody at
2 the time?

3 A. Yes, with the conversation with Exova.

4 Q. Just to be clear, is this the one in March 2015?

5 A. March, end of March, start of April.

6 Q. Right, we will look at those emails.

7 I don't think you have put in your statement
8 anywhere your opinion at the time that it was not
9 possible to comply with paragraph 12.8 and section 9 of
10 Approved Document B?

11 A. Why would I? That's only one route to compliance.

12 Q. All right.

13 Now, let's look at paragraph 9.13 at page 86
14 {CLG00000224/86}, please. This says:

15 "Every cavity barrier should be constructed to
16 provide at least 30 minutes fire resistance. It may be
17 formed by any construction provided for another purpose
18 if it meets the provisions for cavity barriers (see
19 Appendix A, Table A 1, item 15)."

20 Were you familiar with that provision as at
21 July 2015?

22 A. I was familiar with that provision and what we had in
23 the spec, although in the spec I think we actually had
24 30/30.

25 Q. Right. Looking down the page at 9.14,;

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1 "A cavity barrier should, wherever possible, be
2 tightly fitted to a rigid construction and mechanically
3 fixed in position."

4 Do you see that?

5 A. Yes.

6 Q. Were you familiar with that as at July/August 2014?

7 A. It's self-evident to me.

8 Q. Then if you go to appendix A, table A1, which is
9 referred to at the beginning of 9.13, Mr Crawford,
10 that's at page 124 {CLG00000224/124} of this document,
11 this says that cavity barriers should have a minimum of
12 30 minutes' integrity and 15 minutes' insulation,
13 doesn't it?

14 A. Yes.

15 Q. Were you familiar with that --

16 A. Yes.

17 Q. -- at the time?

18 Just to go back to an answer to some of my questions
19 earlier on, if you were of the view at the time that it
20 was not possible to comply with all of the guidance in
21 Approved Document B in relation to cavity barriers for
22 the proposed rainscreen cladding at Grenfell Tower, how
23 were you expecting to comply with functional requirement
24 B3 of the Building Regulations?

25 A. To install as far as practical a cavity barrier

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1 strategy.

2 Q. Around the windows?

3 A. Not round the windows for the reasons I've given.

4 Q. If you didn't provide cavity barriers around the
5 windows, which are openings in accordance with
6 diagram 33, then, Mr Crawford, how were you going to
7 comply with functional requirement B3?

8 A. The cavity barriers were around the compartments, and
9 you would probably have seen from the correspondence and
10 the fact that rainscreen cladding wouldn't stay in place
11 in a developed fire, therefore the cavity barriers
12 wouldn't perform a meaningful function in those
13 locations anyway, not that you could get them into those
14 locations precisely in the terms set out in B3.
15 Additionally, we had cavity barriers in close proximity
16 anyway at the head and sides.

17 Q. The head and the sides -- we will come to precisely
18 where the cavity barriers were in due course.

19 Can I just ask you this, given your answers just
20 now: did you ever raise with Harley or Rydon or Exova
21 your view that it was not going to be possible to put
22 cavity barriers around the window openings, given the
23 design of the rainscreen cladding?

24 A. I had a conversation with Exova in relation to practical
25 application of cavity barriers in the rainscreen façade.

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1 Q. Is that the discussion we see in the emails at the end
2 of March?
3 A. That's correct.
4 Q. Anything else?
5 A. Harley had their own ideas about a cavity barrier
6 strategy that was quite different, again, as you will
7 see.
8 Q. Okay. Perhaps we will come back and revisit this
9 question again when we have looked at the emails.
10 I want to turn, in the context of cavity barriers,
11 to look at the NBS specification. Now, I know this was
12 prepared before your involvement, Mr Crawford, but let's
13 look at it. It's {SEA00000169/246}.
14 If you look there, under paragraph 435, "Ventilated
15 cavity barriers" -- do you see that?
16 A. Yes.
17 Q. "Manufacturer: Downer Cladding Systems ..."
18 Then:
19 "Product reference: Lamatherm, CW-RSH60
20 (horizontal), Lamatherm CW-RSV60 (vertical)."
21 Do you see that?
22 A. Yes.
23 Q. Then we can see underneath that, fifth bullet down:
24 "Fire resistance rating: 30/30 to BS 476, Part 20:
25 1987 and BS EN 1366-4:2006."

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1 Do you see that?
2 A. Yes.
3 Q. Does that fifth bullet point down mean 30 minutes'
4 insulation and 30 minutes' integrity?
5 A. Yes.
6 Q. I see.
7 Now, the minimum performance stated in ADB, as we've
8 seen, is 30 minutes' insulation and 15 minutes'
9 integrity, isn't it?
10 A. Yes.
11 Q. Is it right, then, that the fire resistance required by
12 the NBS spec here would meet and in fact exceed the
13 minimum performance standard required by ADB?
14 A. Yes.
15 Q. If we then go up to the last sentence of the first
16 dashed bullet point, we looked at that, the product
17 reference, "Lamatherm CW-RSH60 (horizontal) ... CW-RSV60
18 (vertical)", did that suggest that the fire resistance
19 for the cavity barriers actually specified was
20 60 minutes?
21 A. I'm not sure. I don't think Lamatherm were even the
22 manufacturer.
23 Q. Lamatherm is a product. The manufacturer is people
24 called Downer.
25 I should just be clear, Lamatherm became Siderise.

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1 A. Siderise, yes, that's right.
2 So, sorry, your question was ...?
3 Q. My question is whether the reference to 60 in the
4 product reference of RSH60, RSV60, was actually a fire
5 resistance period of 60 minutes?
6 A. It may well have been.
7 Q. Right. Can you explain the difference?
8 A. No, except the requirement was only for 30/15.
9 Q. I understand that, and you have said that, but did you
10 notice the difference when you did read this spec?
11 A. No, I think I would have just read the fire resistance
12 rating.
13 Q. Okay.
14 When you started working on the project, did you
15 independently check the cavity barrier products that had
16 been specified?
17 A. I remember having conversations about the cavity barrier
18 strategy with Bruce. I don't recall whether
19 I individually checked the products specified.
20 Q. Okay. You remember a conversation about the strategy
21 with Bruce; was that on the handover?
22 A. It may have been later, I'm not sure.
23 Q. Okay.
24 Do you remember ever looking for any test
25 certification that supported the use of these products

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1 in a rainscreen system?
2 A. Erm ... I don't recall.
3 Q. Can we look at the Harley design, then.
4 In August 2014, I think it's right that Harley began
5 sending you drawings of their detailed design of the
6 cladding; do you remember that?
7 A. Mm.
8 Q. If we turn to {SEA00011490}, we can see that this is
9 an email from Kevin Lamb to Simon Lawrence on
10 22 August 2014, which is copied to Daniel Anketell-Jones
11 and to you at Studio E as well as to Bruce Sounes. Do
12 you see that?
13 A. Yes.
14 Q. The attachments -- there are two of them -- are GA
15 models for the tower. He says:
16 "Simon,
17 "Please find attached some preliminary drawings to
18 prove the basics of design & set out, prior to us
19 producing a full design package.
20 "It would be useful for us to discuss these
21 principles at our meeting on Tuesday morning."
22 You see that?
23 A. Yes.
24 Q. The attachments there are {SEA00002851}. Just have
25 those up, thank you. As you can see from the date at

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1 the bottom -- don't need to blow it up -- it's
 2 20 August 2014. Do you see that?
 3 A. Mm-hm.
 4 Q. And "Drawn by", in the box to the left, "bd", and there
 5 is a little quadruped.
 6 A. Lamb.
 7 Q. Lamb, and KVL, which is Mr Lamb, and that's how we know
 8 it's his, and then you can see the drawings there; do
 9 you see that?
 10 A. Yes.
 11 Q. Now, correct me if I'm wrong, but there are no cavity
 12 barriers indicated on that drawing, are there?
 13 A. That's correct.
 14 Q. No. If we look through each of the next few drawings,
 15 scrolling down slowly, I think it's right, isn't it,
 16 that there are no cavity barriers on each of those
 17 either, or any of those?
 18 A. That's correct.
 19 Q. Right.
 20 Did you think it was strange, given that the
 21 employer's requirement drawings had included some cavity
 22 barriers?
 23 A. No, because they issued the RFI at virtually the same
 24 time.
 25 Q. You say at virtually the same time; the RFI we saw

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1 before was September, wasn't it?
 2 A. Yes.
 3 Q. So when you say same time, perhaps it's my fault, same
 4 time as what?
 5 A. These drawings.
 6 Q. I see. So these drawings pre-date the RFI?
 7 A. They do. I mean, these drawings were preliminary, and
 8 I think I commented at the time were very basic. They
 9 were intended to show the basic layout, let's say, of
 10 panels, and then the RFI followed shortly afterwards.
 11 Q. When you received these drawings, you didn't know that
 12 the RFI was coming a few days later, did you?
 13 A. That's correct.
 14 Q. So when you received these, why didn't you go to
 15 Kevin Lamb or anyone else at Harley and say, "Wait
 16 a minute, why are there no cavity barriers around the
 17 windows as shown in the employer's requirement
 18 drawings?"
 19 A. We may have done. I possibly did, I don't recall.
 20 These were, as I stated, preliminary drawings to show
 21 the proportions in setting out.
 22 Q. Mr Crawford, you say, "We may have done". We have no
 23 record of that and it's not in your statement that you
 24 did, and we have to proceed on that basis, so that's why
 25 I was asking you why you didn't.

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1 A. But I'm not sure that that's the case. I suppose what
 2 I'm saying is these were preliminary drawings and they
 3 were showing proportions and it was his first pass,
 4 let's say, at setting out, and things like the detail
 5 follows on from that. I mean, if you had, for example,
 6 produced this drawing and six months later there were no
 7 cavity barriers, then yeah, sure, it would send alarm
 8 bells ringing.
 9 Q. Right. Okay.
 10 Let's just see what you did do. If you go, please,
 11 to {SEA00002853}, these are your -- well, you help me.
 12 The red handwriting is yours. I think we're used to
 13 that now.
 14 A. Yeah. As I recall, when we did these comments, Kevin
 15 sent them out for initial comments about the proportions
 16 and the setting out. There were also a number of
 17 workshops that we had as well where we met them on site
 18 and the drawings were discussed. So, you know, the
 19 cavity barriers may have been discussed in those.
 20 Q. Well, all right, but just looking at your comments on
 21 these drawings, Mr Crawford, we can see, just taking it
 22 in stages, first of all there is a box on the first
 23 drawing in the bottom left, "Neil Crawford 27/08/14",
 24 and you have put "Studio E, status B"; yes?
 25 A. Yes.

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1 Q. That's, as it were, a handwritten form of the stamp that
 2 normally goes on these?
 3 A. Yes.
 4 Q. And status B means conforms to design intent subject to
 5 comments?
 6 A. Yes.
 7 Q. Here are your comments. This is on the first one:
 8 "Intention was to keep this joint wide joint ..."
 9 Have I misread that?
 10 A. Yeah. There's actually several sets of comments done on
 11 these drawings.
 12 Q. There are.
 13 A. Bruce did a set, I did a set. They were literally
 14 an initial appraisal of an initial attempt to reconcile
 15 our architectural intent with the practical --
 16 a practical initial set of short drawings.
 17 Q. We can see on these drawings -- and take your time and
 18 have them scrolled down for you, if you like. If we go
 19 to the next one down, please, Mr Operator, we can see
 20 a set of comments on the second page, "Indicate which is
 21 trickle vent", "Omit fixing and extend cill to create
 22 drip detail" -- is that right?
 23 A. Yes.
 24 Q. "... and critically eliminating line of fixings",
 25 et cetera.

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1 One could look at these and look at all of them.
 2 It's really about what's not there. We can't see you
 3 saying anywhere here, "Why is there no cavity barrier
 4 around the windows?"
 5 A. That's correct.
 6 Q. No. Would this not have been the time to raise that in
 7 your comments?
 8 A. As I said, we had several -- we had meetings on site and
 9 workshops, and it's highly probable that they were and
 10 that's why Harley raised the RFI.
 11 Q. Do you have a specific recollection of raising the
 12 absence of cavity barriers round the windows with Harley
 13 at around this time?
 14 A. I can't recall.
 15 Q. No.
 16 Let's look at the Harley RFI, which we looked at
 17 earlier this morning. It's {HAR00003616}.
 18 A. Can I just say that with that initial set of drawings
 19 that went out, they were sent out under the auspices of
 20 being preliminary and for initial comments. I mean,
 21 they weren't set out in the sense that there was any
 22 finality to them. So you would normally expect,
 23 for example, more detail to be added over time, as the
 24 drawings were developed up.
 25 Q. I understand, and I think what we have so far is at this

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1 stage in time, when it comes to you for comment on
 2 24 August 2014, you don't comment on it that there are
 3 no cavity barriers. We have seen that.
 4 A. Yes.
 5 Q. Let's move on, then, to the RFI. Here it is. We saw it
 6 earlier this morning. 17 September. The query, just to
 7 repeat it now that we are talking about cavity barriers:
 8 "Please may you confirm the required extent of the
 9 horizontal firebreaks within the cladding areas?"
 10 Then the suggested solution -- and, again, I'm
 11 repeating this to you, I am afraid:
 12 "We believe that they will be required at every
 13 floor level on the vertical columns, but not in the area
 14 of cladding between windows. This is because there is
 15 no 'chimney' effect here, and therefore the cladding
 16 will not add to the spread of fire."
 17 You see that?
 18 A. Yes.
 19 Q. So there is no question that's raised, "Do we need
 20 firebreaks", as they call them, "or cavity barriers
 21 around the windows?", is there? That's not part of the
 22 question.
 23 A. No.
 24 Q. The use of the word "firebreaks" is interesting. Do you
 25 agree with me that the word "firebreak" is not a term

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1 used in Approved Document B?
 2 A. Erm ... not in Document B, but I notice it was used in
 3 BR 135.
 4 Q. Yes. I mean, is it a word you have come across in your
 5 experience as an architect up to that point?
 6 A. I think firebreaks, firestops, cavity barriers, are --
 7 can be intermittently used, perhaps wrongly, but they
 8 are. They're used -- what's the word? --
 9 interchangeably?
 10 A. Yeah, interchangeably.
 11 Q. I didn't want to put that word in your mouth, but
 12 I suspect that's what you meant.
 13 A. Yes.
 14 Q. Yes. Now, that's potentially quite confusing, isn't it,
 15 because there's a difference between a firestop and
 16 a cavity barrier?
 17 A. There is, yes.
 18 Q. Did you ever go back to Harley and say "Look, don't use
 19 'firebreaks', can I please be clear what you're asking.
 20 Are you saying cavity barriers or are you saying
 21 firestops?"
 22 A. I think firebreaks to me clearly meant cavity barriers.
 23 Q. You thought it clearly meant cavity barriers?
 24 A. Yes.
 25 Q. Right, and why did you think that?

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1 A. Because I couldn't see what else it would mean.
 2 Q. I see, okay. So you thought it meant cavity barriers.
 3 Now, Harley suggested in the suggested solution that
 4 we've just seen that the installation of firebreaks --
 5 to you, cavity barriers -- was to avoid a so-called
 6 chimney effect. Does that mean fire spreading up the
 7 columns uninhibited?
 8 A. Yeah. What I understood, and I think I may have
 9 explained this the first phase -- it's really difficult
 10 without a whiteboard -- imagine these windows, this is
 11 the window and it is repeating and you have got the
 12 columns in between. They understood the most important
 13 thing to do is break that verticality all the way up the
 14 building. And although the description is slightly
 15 confusing, I understood it as they wanted to put the
 16 cavity barrier between the windows, so like this
 17 (indicated), because the window is actually projected,
 18 so you wouldn't have the chimney effect going up the
 19 front and you would stop it at the columns.
 20 So, if you like, this was their strategy for
 21 addressing the chimney effect.
 22 Q. Right. I see that.
 23 So at this stage, is it right that, so far as you
 24 could see, Harley weren't sure where the horizontal
 25 cavity barriers should be placed?

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1 A. I think if they were left to it, that's where they would
2 have placed them.

3 Q. Would that have been any good?

4 A. Well, you might find that's how it exists in quite a lot
5 of rainscreen cladding or variants of that, but my view
6 was that wasn't sufficient.

7 Q. Right.

8 If we can now go, please, to the emails,
9 {SEA00011730/4}. I'm sorry to have to drag you back to
10 this email run again. This is September 2014. We
11 looked at this probably ad nauseam this morning, I am
12 afraid, Mr Crawford, but there it is. There is the
13 question asked by Mr Anketell-Jones which you referred
14 on to Exova on 18 September and asked Mr Ashton for his
15 view.

16 Do you know why Studio E was not able to answer that
17 question, or why were you not able to answer that
18 question yourself?

19 A. Well, I think there's two points I would make. First of
20 all, we did have a cavity barrier strategy. I'm aware
21 personally of the shortcomings of section 9,
22 particularly in its sort of -- of ADB2, its sort of
23 restricted remit in terms of what it seems to refer to,
24 and in my view it doesn't cover or adequately cover
25 dealing with a rainscreen façade or a double-skinned

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1 façade or an overclad façade, for that matter. So it
2 made sense to me to initiate the conversation with Exova
3 to understand their understanding of what was reasonable
4 in that context.

5 Q. Yes. You don't in the message that you sent to
6 Mr Ashton say to him or impart to him the sense of what
7 you're telling us, which is that you think there are
8 shortcomings in section 9 in ADB2, which means that it
9 doesn't easily apply to the cavity barrier strategy that
10 you were adopting. You don't say that, do you?

11 A. Well, not in the email.

12 Q. No, so Mr --

13 A. What I referenced in the email specifically is Harley's
14 interpretation of the stack effect. I suppose that's
15 because I thought I might have missed something. Harley
16 have produced -- well, many more overclads than myself,
17 so maybe they know something I don't, so --

18 Q. Right.

19 Did you seek the advice of anybody else at Studio E
20 first before going to Mr Ashton with the question?

21 A. Well, I would certainly have had the conversation with
22 Bruce probably about what our strategy was and what he
23 believed.

24 Q. What did he tell you?

25 A. I think he was pretty adamant that our strategy was

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1 correct.

2 Q. Right.

3 You talk about the cavity barrier strategy. Can you
4 just summarise that for me, so that I'm clear about what
5 you mean in the context of these messages?

6 A. As in our --

7 Q. Yes.

8 A. -- one that we had --

9 Q. Yes, your cavity barrier strategy.

10 A. It was cavity barriers that related to the compartment
11 lines. So, for example, the illustration I used
12 earlier, if this is the plan of the apartment and you
13 have got the façade here (indicated), you have
14 compartment walls round here, compartment walls
15 typically 60 minutes, except where they're onto escapes,
16 they're 120, and so if you imagine that's the floor plan
17 of the whole apartment, you wouldn't have a cavity
18 barrier at the rooms where they hit the external wall,
19 but you would have them where the compartment lines are,
20 which you could see in the fire strategy plans.

21 So, for example, imagine this is the apartment, you
22 would have a 60-minute -- sorry, you would have the
23 compartment -- you would follow the compartment line, so
24 you would be protecting one compartment from the next.

25 Q. Yes, I see, thank you.

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1 Just so we're clear, the cavity barrier strategy
2 that you have just explained to us doesn't involve any
3 strategy requiring the installation of cavity barriers
4 round the windows?

5 A. No.

6 Q. Were you not surprised that a specialist cladding
7 contractor like Harley would have a query of this
8 nature?

9 A. Perhaps, but then when you read the actual email where
10 they say -- in fact, it's here, isn't it? -- "local fire
11 officer, as opinions tend to vary", and that is
12 definitely the case, and one of the reasons I think that
13 is the case is because Approved Document B is really not
14 fit for purpose in that respect.

15 Q. We have looked at this series of emails and drawings you
16 sent to Exova already. If we go up to page 3
17 {SEA00011730/3} of this email chain, you can see that
18 the second email down from you to Mr Ashton at 12.18 on
19 18 September, you say:

20 "Hi Terry

21 "Please see attached our sections and the initial
22 drawings set we have had from Harleys. The initial
23 drawings from Harleys are fairly limited but they
24 attempt to establish the basic approach."

25 We looked at that this morning.

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1 If you go, please, to {SEA00011710}, go back to the
2 drawings which we had looked at again this morning, we
3 can see those are the attachments. I think I have given
4 you a wrong reference, but if you go to {SEA00011714},
5 that's the pack of Harley drawings we have already
6 looked at. Those are the same ones dated
7 20 August 2014, without your notes on it. So it's the
8 same pack of what I think you are calling preliminary
9 drawings which don't show any cavity barriers.

10 My question is: did you not think it necessary to
11 clarify with Mr Ashton exactly where he was advising
12 that the cavity barriers needed to be placed by
13 reference to these drawings?

14 A. When you say "he", do you mean Harley?

15 Q. No, Mr Ashton. Did you not think it necessary to
16 clarify with Mr Ashton exactly where Mr Ashton was
17 advising the cavity barriers needed to be placed by
18 reference to these drawings?

19 A. But I think I did. Sorry, can I see the original email
20 again?

21 Q. The original email is back at {SEA00011710}.

22 A. "Please see attached our sections and the initial
23 drawings ... from Harleys."

24 So he had our sections, which showed where we
25 thought the cavity barriers should be, and they had

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1 Harley's drawings without the cavity barriers drawn on,
2 so he could see basically our cavity barrier strategy
3 and he could see, let's say, where Harleys had got to in
4 their design. So he had, if you like, the information
5 for him to make an input.

6 Q. Yes. I think I'm agreeing with you, but I'm just
7 pressing you a bit more.

8 Did you not think it necessary to get him to clarify
9 where exactly the cavity barriers needed to go?

10 A. I think that's what I was doing.

11 Q. I see. All right.

12 A. I mean, again, I know you don't like me saying this, but
13 the reality is there's telephone conversations going on
14 at the same time as emails. I'm not saying specifically
15 now or between this email or that email, but that is the
16 case.

17 Q. At all events, he never comes back to you -- at least we
18 don't ever see him coming back to you -- saying, "Well,
19 you need to have cavity barriers around the windows?"

20 A. No.

21 Q. Indeed, at this stage, all you had to send to Exova,
22 which was available to you, other than the preliminary
23 drawings from Harley, were the employer's requirements
24 drawings from ten months before that?

25 A. Yes, which had our cavity barrier strategy on them.

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1 Q. Indeed.

2 Now, moving forwards in time to January 2015, on
3 13 and 14 January 2015, I think you got another pack of
4 drawings from Kevin Lamb, and that is, just to be clear
5 with you, {SEA00012489}. It's also referred to in your
6 statement, for the transcript, at paragraph 97
7 {SEA00014275/36}. We can see the email there.
8 Kevin Lamb sends you that as a copy. The email itself
9 goes to Simon Lawrence. Do you see that? And you see
10 the attachment?

11 A. I can see the attachment.

12 Q. Yes. Then it says:

13 "Please find attached finalized all 160 off North &
14 South windows all as agreed in our last meeting just
15 before Christmas.

16 "The sample window will be one of these.

17 "If you have any concerns, please advise immediately
18 as manufacture is now starting."

19 Do you see that?

20 A. Yes.

21 Q. Then if you go to {SEA00003040} -- and these are the
22 drawings that you refer to at paragraph 99 of your
23 statement on page 37 {SEA00014275/37}, that's just for
24 the transcript -- here they are, here are the drawings,
25 and if you look at page 1 you can see they were

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1 originally created on 20 August 2014 that we were
2 looking at before, and now they have progressed from
3 August through to January 2015, construction, do you
4 see? This is now revision E --

5 A. Yes.

6 Q. -- in the box on the left-hand side at the bottom.

7 You have marked that, looking at the first one, B,
8 "Conforms to design intent subject to comments". You
9 did that on 16 January 2015, and we can see your
10 comments; yes?

11 A. Yes.

12 Q. Right.

13 Again, in this drawing, even revision E,
14 January 2015, Harley did not indicate where on those
15 drawings any cavity barriers should be located, did
16 they?

17 A. No.

18 Q. And you didn't pull them up on it, did you?

19 A. That's not entirely true.

20 Q. Isn't it?

21 A. No.

22 Q. Well, in this drawing, you didn't, did you?

23 A. In this specific drawing, no.

24 Q. No, and indeed none of the other drawings in this pack
25 comprising what you're sent on 15 January; that's right,

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1 isn't it?

2 A. Correct. What I would point out is that these windows

3 were -- sorry, these drawings were to reflect late

4 client decision and window -- late client decision that

5 related to the change in the window sizes.

6 Q. Yes.

7 A. So there were separate conversations going on in

8 relation to the cavity barrier strategy that stretched

9 back to 17 September, and continued on in various

10 workshops in relation to determining the final strategy.

11 So these drawings were an attempt to pin down the

12 revised window format that had come about due to

13 a number of late changes in the actual design and size

14 of the windows.

15 Q. Indeed, if you look at page 3 {SEA00003040/3}, here is

16 a drawing, "Typical bay levels 1 to 20 south elevation",

17 this is revision B, 13 January 2015, which you have

18 stamped A, "Conforms to design intent"; yes?

19 A. Yes.

20 Q. But that doesn't have any cavity barriers anywhere on

21 that, does it?

22 A. No.

23 Q. It's right, therefore, isn't it, that it therefore did

24 not even reflect Studio E's employer's requirement

25 drawings, which did have cavity barriers?

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1 A. Correct, but I've explained the situation in relation to

2 the cavity barriers to you, and it's not that -- it's

3 not that these -- that there wasn't the understanding

4 that cavity barriers were going in, it's just that the

5 strategy was being developed separately. I mean,

6 for example, these drawings don't show the cladding rail

7 positions, but you wouldn't say, well, therefore it's

8 not an applicable drawing. I mean, there is a lot of

9 things these drawings don't show.

10 Q. No, my question -- perhaps you misunderstood it. Given

11 that the Studio E employer's requirement drawings did

12 contain some cavity barriers, how could Harley's

13 drawings, which didn't contain cavity barriers, be

14 stamped status A, "Conforms to design intent"?

15 A. No, because it's talking about architectural intent.

16 The cavity barriers weren't part of the architectural

17 intent, the same way that the cladding rails weren't

18 part of the architectural intent, the same way that the

19 cladding brackets weren't part of the architectural

20 intent. All of those things could have been shown on

21 this drawing.

22 Q. Was the absence of any cavity barriers on this not

23 a manifest error which any architect should have

24 identified?

25 A. No, absolutely not, for the reasons I have given. It

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1 was absolutely clear that we had a cavity barrier

2 strategy, that the cavity barrier strategy was being

3 developed. There had been numerous discussions about

4 it, there had been meetings on site, and it was

5 understood that we had a cavity barrier strategy and it

6 was to be added to the drawings, which it was. I think

7 it took them until March to actually add the final

8 agreed scheme on. But nonetheless, the idea that

9 somehow, because it wasn't shown on this drawing, it

10 wasn't being discussed or absolutely assumed that it had

11 to be there is a bit like saying, well, the cladding

12 rails aren't there, so surely --

13 Q. I'm going to finish off this line of questions now,

14 Mr Crawford, because of the hour. But you are right

15 that Harley did not produce drawings showing what they

16 called firebreaks until 3 March, and we will come to

17 that now tomorrow morning, but just focusing on this

18 document at this point of period, given that Harley had

19 been producing revisions of the August 2014 drawings now

20 for some months, and had not shown any cavity barriers

21 at all, what were you waiting for?

22 A. There's a lot -- I feel like a broken record here, but

23 basically the -- as I said, and you know because there

24 is a plethora of emails on it, there had been a lot of

25 discussion on the cavity barrier strategy and getting it

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1 to an agreed position that involved, amongst other

2 things, building control, site workshops, et cetera,

3 et cetera.

4 What these drawings are showing were Harley were

5 having to respond very quickly to late changes by the

6 client on the window arrangements. They had come about

7 for a number of reasons, planning reasons, client

8 reasons. These changes were being done very late on and

9 there was a lot of pressure for Harley to get in some

10 form of production. In order for them to do that, they

11 had to agree the basic, basic architectural intent.

12 MR MILLETT: Mr Chairman, it's been a long day and it's now

13 gone 4.30. I am afraid I'm in the middle of a line,

14 but --

15 SIR MARTIN MOORE-BICK: I think Mr Crawford has had a long

16 day anyway.

17 MR MILLETT: He has.

18 SIR MARTIN MOORE-BICK: So it would be a good idea to stop

19 now.

20 Can we give Mr Crawford some reasonable assurance

21 that he will finish tomorrow?

22 MR MILLETT: We can, not least because of the quality of the

23 evidence and the witness himself, but also because

24 Ms Grange, who sits to my right, will have something to

25 say about it if I don't. So yes.

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1 SIR MARTIN MOORE-BICK: Well, Mr Crawford, I'm sorry I've
 2 got to ask you to come back for more questions tomorrow,
 3 but, as you have heard from Mr Millett, he will finish
 4 questioning you tomorrow and that will be it.
 5 So we will break now and resume at 10 o'clock
 6 tomorrow, please. Again, I have to ask you not to
 7 discuss your evidence or any aspect of it over the
 8 break. Is that all right?
 9 THE WITNESS: Yes.
 10 SIR MARTIN MOORE-BICK: You go with the usher and we will
 11 see you tomorrow morning.
 12 (Pause)
 13 All right, thank you very much. 10 o'clock
 14 tomorrow, please.
 15 (4.35 pm)
 16 (The hearing adjourned until 10 am on Tuesday,
 17 10 March 2020)
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