## OPUS 2 INTERNATIONAL

Grenfell Tower Inquiry

Day 36

September 15, 2020

Opus 2 International - Official Court Reporters

Phone: +44 (0)20 3008 5900

Email: transcripts@opus2.com

Website: https://www.opus2.com

1	Tuesday, 15 September 2020	1	SIR	R MARTIN MOORE-BICK: Thank you very much indeed.
2	(10.00 am)	2	MS	GRANGE: Sorry about that, thank you.
3	SIR MARTIN MOORE-BICK: Good morning, everyone. Welcome to	3	SIR	R MARTIN MOORE-BICK: I gather you've got it now?
4	today's hearing. Today we're going to continue hearing	4	MS	GRANGE: We've got it now, thank you.
5	from Mr Anketell-Jones, so would you ask the witness to	5		So we can see from this document that it says "CWCT $$
6	come back into the room, please.	6		AGM and Members' Meeting" on Tuesday, 7 October 2014.
7	MR DANIEL ANKETELL-JONES (continued)	7		Do you see that there at the top?
8	SIR MARTIN MOORE-BICK: Good morning, Mr Anketell-Jones.	8	A.	Yes.
9	THE WITNESS: Good morning, sir.	9	Q.	I just want to identify where you are first . Under the
10	SIR MARTIN MOORE-BICK: Are you ready to carry on?	10		members list on the left -hand side, if we go down to the
11	THE WITNESS: Yes.	11		bottom of the page, we can see if you look at the
12	SIR MARTIN MOORE-BICK: Good, thank you very much.	12		seventh line up from the bottom, I think there is your
13	Ms Grange, yes.	13		name, "Daniel Anketell-Jones, Harley Curtain Wall Ltd".
14	Questions from COUNSEL TO THE INQUIRY (continued)	14		Do you see that there?
15	MS GRANGE: Yes, thank you.	15	A.	Yes.
16	Good morning, Mr Anketell-Jones.	16	Q.	You are also there with Mr Mark Stapley underneath, do
17	First, what I want to do is just follow up on	17		you see that there, of Harley as well?
18	a number of the answers that you gave to my questions	18	A.	Yes.
19	yesterday.	19	Q.	Staying with this bottom part of the page, can you see
20	You were asked about membership of the CWCT and	20	`	there on the right it says:
21	whether you had attended a CWCT members' meeting	21		"Non-member.
22	in October 2014. Do you remember that yesterday?	22		"Jonathan Roome, Celotex Ltd."
23	A. Yes.	23		Do you see that?
24	Q. And you said {Day35/123:17}:	24	Α.	Yes.
25	" I can't remember what it was on or whether it	25		So we think this is the meeting at which you met a
			ζ.	·
	1			3
1	OMOT			
_	was CWCT or not."	1		member of Celotex, and that would appear to be Mr Roome.
2	That's what you said yesterday.	1 2		member of Celotex, and that would appear to be Mr Roome.  Does that sound right to you?
			A.	
2	That's what you said yesterday.	2		Does that sound right to you?
2	That's what you said yesterday.  A. Yes.	2		Does that sound right to you? Yes.
2 3 4	That's what you said yesterday.  A. Yes.  Q. Now, in fact what we can see from the documents, we	2 3 4		Does that sound right to you?  Yes.  If we look back at the top of this document for the
2 3 4 5	That's what you said yesterday.  A. Yes.  Q. Now, in fact what we can see from the documents, we think, is that you did attend a CWCT AGM and members'	2 3 4 5		Does that sound right to you?  Yes.  If we look back at the top of this document for the meeting, we can see that the speakers include, second
2 3 4 5 6	That's what you said yesterday.  A. Yes.  Q. Now, in fact what we can see from the documents, we think, is that you did attend a CWCT AGM and members' meeting on 7 October 2014 at which Mr Jonathan Roome of	2 3 4 5 6		Does that sound right to you?  Yes.  If we look back at the top of this document for the meeting, we can see that the speakers include, second person down on the left, Sarah Colwell of the BRE, do you see that there?
2 3 4 5 6 7	That's what you said yesterday.  A. Yes.  Q. Now, in fact what we can see from the documents, we think, is that you did attend a CWCT AGM and members' meeting on 7 October 2014 at which Mr Jonathan Roome of Celotex was also present. I want to just pull up	2 3 4 5 6 7	Q.	Does that sound right to you?  Yes.  If we look back at the top of this document for the meeting, we can see that the speakers include, second person down on the left, Sarah Colwell of the BRE, do you see that there?
2 3 4 5 6 7 8	That's what you said yesterday.  A. Yes.  Q. Now, in fact what we can see from the documents, we think, is that you did attend a CWCT AGM and members' meeting on 7 October 2014 at which Mr Jonathan Roome of Celotex was also present. I want to just pull up a document, this is {CEL00001037}.	2 3 4 5 6 7 8	Q.	Does that sound right to you?  Yes.  If we look back at the top of this document for the meeting, we can see that the speakers include, second person down on the left, Sarah Colwell of the BRE, do you see that there?  Yes.
2 3 4 5 6 7 8 9	That's what you said yesterday.  A. Yes.  Q. Now, in fact what we can see from the documents, we think, is that you did attend a CWCT AGM and members' meeting on 7 October 2014 at which Mr Jonathan Roome of Celotex was also present. I want to just pull up a document, this is {CEL00001037}.  Is it coming up on the screen?	2 3 4 5 6 7 8 9	Q.	Does that sound right to you?  Yes.  If we look back at the top of this document for the meeting, we can see that the speakers include, second person down on the left, Sarah Colwell of the BRE, do you see that there?  Yes.  Now, her talk was entitled "Fire Testing Experiences"
2 3 4 5 6 7 8 9	That's what you said yesterday.  A. Yes.  Q. Now, in fact what we can see from the documents, we think, is that you did attend a CWCT AGM and members' meeting on 7 October 2014 at which Mr Jonathan Roome of Celotex was also present. I want to just pull up a document, this is {CEL00001037}.  Is it coming up on the screen?  SIR MARTIN MOORE-BICK: We've got it on the screen.	2 3 4 5 6 7 8 9	Q.	Does that sound right to you?  Yes.  If we look back at the top of this document for the meeting, we can see that the speakers include, second person down on the left, Sarah Colwell of the BRE, do you see that there?  Yes.  Now, her talk was entitled "Fire Testing Experiences" and appeared to go into considerable detail on fire
2 3 4 5 6 7 8 9 10 11	That's what you said yesterday.  A. Yes.  Q. Now, in fact what we can see from the documents, we think, is that you did attend a CWCT AGM and members' meeting on 7 October 2014 at which Mr Jonathan Roome of Celotex was also present. I want to just pull up a document, this is {CEL00001037}.  Is it coming up on the screen?  SIR MARTIN MOORE-BICK: We've got it on the screen.  MS GRANGE: Ah, it's not on my screen, sorry. My screen is blank.	2 3 4 5 6 7 8 9 10	Q.	Yes.  If we look back at the top of this document for the meeting, we can see that the speakers include, second person down on the left, Sarah Colwell of the BRE, do you see that there?  Yes.  Now, her talk was entitled "Fire Testing Experiences" and appeared to go into considerable detail on fire testing for facades, including BS 8414 and BR 135. We have the slides for that talk and I want to show them to
2 3 4 5 6 7 8 9 10 11	That's what you said yesterday.  A. Yes.  Q. Now, in fact what we can see from the documents, we think, is that you did attend a CWCT AGM and members' meeting on 7 October 2014 at which Mr Jonathan Roome of Celotex was also present. I want to just pull up a document, this is {CEL00001037}.  Is it coming up on the screen?  SIR MARTIN MOORE-BICK: We've got it on the screen.  MS GRANGE: Ah, it's not on my screen, sorry. My screen is	2 3 4 5 6 7 8 9 10 11 12 13	Q.	Yes.  If we look back at the top of this document for the meeting, we can see that the speakers include, second person down on the left, Sarah Colwell of the BRE, do you see that there?  Yes.  Now, her talk was entitled "Fire Testing Experiences" and appeared to go into considerable detail on fire testing for facades, including BS 8414 and BR 135. We
2 3 4 5 6 7 8 9 10 11 12 13 14	A. Yes.  Q. Now, in fact what we can see from the documents, we think, is that you did attend a CWCT AGM and members' meeting on 7 October 2014 at which Mr Jonathan Roome of Celotex was also present. I want to just pull up a document, this is {CEL00001037}.  Is it coming up on the screen?  SIR MARTIN MOORE-BICK: We've got it on the screen.  MS GRANGE: Ah, it's not on my screen, sorry. My screen is blank.  SIR MARTIN MOORE-BICK: Right. Perhaps we should get that sorted out.	2 3 4 5 6 7 8 9 10 11 12 13 14	Q.	Poes that sound right to you?  Yes.  If we look back at the top of this document for the meeting, we can see that the speakers include, second person down on the left, Sarah Colwell of the BRE, do you see that there?  Yes.  Now, her talk was entitled "Fire Testing Experiences" and appeared to go into considerable detail on fire testing for facades, including BS 8414 and BR 135. We have the slides for that talk and I want to show them to you.  If we can bring up {CEL00001038}. If we could zoom
2 3 4 5 6 7 8 9 10 11 12 13 14 15	A. Yes.  Q. Now, in fact what we can see from the documents, we think, is that you did attend a CWCT AGM and members' meeting on 7 October 2014 at which Mr Jonathan Roome of Celotex was also present. I want to just pull up a document, this is {CEL00001037}.  Is it coming up on the screen?  SIR MARTIN MOORE-BICK: We've got it on the screen.  MS GRANGE: Ah, it's not on my screen, sorry. My screen is blank.  SIR MARTIN MOORE-BICK: Right. Perhaps we should get that sorted out.  (Pause)	2 3 4 5 6 7 8 9 10 11 12 13 14 15	Q.	Yes.  If we look back at the top of this document for the meeting, we can see that the speakers include, second person down on the left, Sarah Colwell of the BRE, do you see that there?  Yes.  Now, her talk was entitled "Fire Testing Experiences" and appeared to go into considerable detail on fire testing for facades, including BS 8414 and BR 135. We have the slides for that talk and I want to show them to you.  If we can bring up {CEL00001038}. If we could zoom in to start with on the top half of that page. So we
2 3 4 5 6 7 8 9 10 11 12 13 14 15 16	That's what you said yesterday.  A. Yes.  Q. Now, in fact what we can see from the documents, we think, is that you did attend a CWCT AGM and members' meeting on 7 October 2014 at which Mr Jonathan Roome of Celotex was also present. I want to just pull up a document, this is {CEL00001037}.  Is it coming up on the screen?  SIR MARTIN MOORE-BICK: We've got it on the screen.  MS GRANGE: Ah, it's not on my screen, sorry. My screen is blank.  SIR MARTIN MOORE-BICK: Right. Perhaps we should get that sorted out.  (Pause)  Are you still blank?	2 3 4 5 6 7 8 9 10 11 12 13 14 15 16	Q.	Yes.  If we look back at the top of this document for the meeting, we can see that the speakers include, second person down on the left, Sarah Colwell of the BRE, do you see that there?  Yes.  Now, her talk was entitled "Fire Testing Experiences" and appeared to go into considerable detail on fire testing for facades, including BS 8414 and BR 135. We have the slides for that talk and I want to show them to you.  If we can bring up {CEL00001038}. If we could zoom in to start with on the top half of that page. So we can see there that top left slide, the talk was called
2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17	A. Yes.  Q. Now, in fact what we can see from the documents, we think, is that you did attend a CWCT AGM and members' meeting on 7 October 2014 at which Mr Jonathan Roome of Celotex was also present. I want to just pull up a document, this is {CEL00001037}.  Is it coming up on the screen?  SIR MARTIN MOORE-BICK: We've got it on the screen.  MS GRANGE: Ah, it's not on my screen, sorry. My screen is blank.  SIR MARTIN MOORE-BICK: Right. Perhaps we should get that sorted out.  (Pause)  Are you still blank?  MS GRANGE: My screen is blank so I can't see the document.	2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17	Q.	Yes.  If we look back at the top of this document for the meeting, we can see that the speakers include, second person down on the left, Sarah Colwell of the BRE, do you see that there?  Yes.  Now, her talk was entitled "Fire Testing Experiences" and appeared to go into considerable detail on fire testing for facades, including BS 8414 and BR 135. We have the slides for that talk and I want to show them to you.  If we can bring up {CEL00001038}. If we could zoom in to start with on the top half of that page. So we can see there that top left slide, the talk was called "Fire Testing Experiences" at the CWCT technical
2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18	A. Yes.  Q. Now, in fact what we can see from the documents, we think, is that you did attend a CWCT AGM and members' meeting on 7 October 2014 at which Mr Jonathan Roome of Celotex was also present. I want to just pull up a document, this is {CEL00001037}.  Is it coming up on the screen?  SIR MARTIN MOORE-BICK: We've got it on the screen.  MS GRANGE: Ah, it's not on my screen, sorry. My screen is blank.  SIR MARTIN MOORE-BICK: Right. Perhaps we should get that sorted out.  (Pause)  Are you still blank?  MS GRANGE: My screen is blank so I can't see the document.  SIR MARTIN MOORE-BICK: No, no, you can't ask questions if	2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18	Q.	Yes.  If we look back at the top of this document for the meeting, we can see that the speakers include, second person down on the left, Sarah Colwell of the BRE, do you see that there?  Yes.  Now, her talk was entitled "Fire Testing Experiences" and appeared to go into considerable detail on fire testing for facades, including BS 8414 and BR 135. We have the slides for that talk and I want to show them to you.  If we can bring up {CEL00001038}. If we could zoom in to start with on the top half of that page. So we can see there that top left slide, the talk was called "Fire Testing Experiences" at the CWCT technical meeting, and this seems to be dated 10 October 2014,
2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19	A. Yes.  Q. Now, in fact what we can see from the documents, we think, is that you did attend a CWCT AGM and members' meeting on 7 October 2014 at which Mr Jonathan Roome of Celotex was also present. I want to just pull up a document, this is {CEL00001037}.  Is it coming up on the screen?  SIR MARTIN MOORE-BICK: We've got it on the screen.  MS GRANGE: Ah, it's not on my screen, sorry. My screen is blank.  SIR MARTIN MOORE-BICK: Right. Perhaps we should get that sorted out.  (Pause)  Are you still blank?  MS GRANGE: My screen is blank so I can't see the document.  SIR MARTIN MOORE-BICK: No, no, you can't ask questions if you can't see the document.	2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18	Q. A. Q.	Yes.  If we look back at the top of this document for the meeting, we can see that the speakers include, second person down on the left, Sarah Colwell of the BRE, do you see that there?  Yes.  Now, her talk was entitled "Fire Testing Experiences" and appeared to go into considerable detail on fire testing for facades, including BS 8414 and BR 135. We have the slides for that talk and I want to show them to you.  If we can bring up {CEL00001038}. If we could zoom in to start with on the top half of that page. So we can see there that top left slide, the talk was called "Fire Testing Experiences" at the CWCT technical meeting, and this seems to be dated 10 October 2014, Dr Sarah Colwell. Do you see that there?
2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20	A. Yes.  Q. Now, in fact what we can see from the documents, we think, is that you did attend a CWCT AGM and members' meeting on 7 October 2014 at which Mr Jonathan Roome of Celotex was also present. I want to just pull up a document, this is {CEL00001037}.  Is it coming up on the screen?  SIR MARTIN MOORE-BICK: We've got it on the screen.  MS GRANGE: Ah, it's not on my screen, sorry. My screen is blank.  SIR MARTIN MOORE-BICK: Right. Perhaps we should get that sorted out.  (Pause)  Are you still blank?  MS GRANGE: My screen is blank so I can't see the document.  SIR MARTIN MOORE-BICK: No, no, you can't ask questions if you can't see the document.  MS GRANGE: It is a slight hindrance. My memory is good but	2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20	Q. A. Q.	Yes.  If we look back at the top of this document for the meeting, we can see that the speakers include, second person down on the left, Sarah Colwell of the BRE, do you see that there?  Yes.  Now, her talk was entitled "Fire Testing Experiences" and appeared to go into considerable detail on fire testing for facades, including BS 8414 and BR 135. We have the slides for that talk and I want to show them to you.  If we can bring up {CEL00001038}. If we could zoom in to start with on the top half of that page. So we can see there that top left slide, the talk was called "Fire Testing Experiences" at the CWCT technical meeting, and this seems to be dated 10 October 2014, Dr Sarah Colwell. Do you see that there?
2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21	That's what you said yesterday.  A. Yes.  Q. Now, in fact what we can see from the documents, we think, is that you did attend a CWCT AGM and members' meeting on 7 October 2014 at which Mr Jonathan Roome of Celotex was also present. I want to just pull up a document, this is {CEL00001037}.  Is it coming up on the screen?  SIR MARTIN MOORE-BICK: We've got it on the screen.  MS GRANGE: Ah, it's not on my screen, sorry. My screen is blank.  SIR MARTIN MOORE-BICK: Right. Perhaps we should get that sorted out.  (Pause)  Are you still blank?  MS GRANGE: My screen is blank so I can't see the document.  SIR MARTIN MOORE-BICK: No, no, you can't ask questions if you can't see the document.  MS GRANGE: It is a slight hindrance. My memory is good but not that good.	2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21	Q. A. Q.	Yes.  If we look back at the top of this document for the meeting, we can see that the speakers include, second person down on the left, Sarah Colwell of the BRE, do you see that there?  Yes.  Now, her talk was entitled "Fire Testing Experiences" and appeared to go into considerable detail on fire testing for facades, including BS 8414 and BR 135. We have the slides for that talk and I want to show them to you.  If we can bring up {CEL00001038}. If we could zoom in to start with on the top half of that page. So we can see there that top left slide, the talk was called "Fire Testing Experiences" at the CWCT technical meeting, and this seems to be dated 10 October 2014, Dr Sarah Colwell. Do you see that there?  Yes.  Then underneath we can see the objectives of the talk:
2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22	A. Yes.  Q. Now, in fact what we can see from the documents, we think, is that you did attend a CWCT AGM and members' meeting on 7 October 2014 at which Mr Jonathan Roome of Celotex was also present. I want to just pull up a document, this is {CEL00001037}.  Is it coming up on the screen?  SIR MARTIN MOORE-BICK: We've got it on the screen.  MS GRANGE: Ah, it's not on my screen, sorry. My screen is blank.  SIR MARTIN MOORE-BICK: Right. Perhaps we should get that sorted out.  (Pause)  Are you still blank?  MS GRANGE: My screen is blank so I can't see the document.  SIR MARTIN MOORE-BICK: No, no, you can't ask questions if you can't see the document.  MS GRANGE: It is a slight hindrance. My memory is good but not that good.  SIR MARTIN MOORE-BICK: I'm sorry about this,	2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22	Q. A. Q.	Poes that sound right to you? Yes.  If we look back at the top of this document for the meeting, we can see that the speakers include, second person down on the left, Sarah Colwell of the BRE, do you see that there? Yes.  Now, her talk was entitled "Fire Testing Experiences" and appeared to go into considerable detail on fire testing for facades, including BS 8414 and BR 135. We have the slides for that talk and I want to show them to you.  If we can bring up {CEL00001038}. If we could zoom in to start with on the top half of that page. So we can see there that top left slide, the talk was called "Fire Testing Experiences" at the CWCT technical meeting, and this seems to be dated 10 October 2014, Dr Sarah Colwell. Do you see that there? Yes.  Then underneath we can see the objectives of the talk: "Incidents.
2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23	A. Yes.  Q. Now, in fact what we can see from the documents, we think, is that you did attend a CWCT AGM and members' meeting on 7 October 2014 at which Mr Jonathan Roome of Celotex was also present. I want to just pull up a document, this is {CEL00001037}.  Is it coming up on the screen?  SIR MARTIN MOORE-BICK: We've got it on the screen.  MS GRANGE: Ah, it's not on my screen, sorry. My screen is blank.  SIR MARTIN MOORE-BICK: Right. Perhaps we should get that sorted out.  (Pause)  Are you still blank?  MS GRANGE: My screen is blank so I can't see the document.  SIR MARTIN MOORE-BICK: No, no, you can't ask questions if you can't see the document.  MS GRANGE: It is a slight hindrance. My memory is good but not that good.  SIR MARTIN MOORE-BICK: I'm sorry about this, Mr Anketell-Jones. We get these very occasional blips.	2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23	Q. A. Q.	Yes.  If we look back at the top of this document for the meeting, we can see that the speakers include, second person down on the left, Sarah Colwell of the BRE, do you see that there?  Yes.  Now, her talk was entitled "Fire Testing Experiences" and appeared to go into considerable detail on fire testing for facades, including BS 8414 and BR 135. We have the slides for that talk and I want to show them to you.  If we can bring up {CEL00001038}. If we could zoom in to start with on the top half of that page. So we can see there that top left slide, the talk was called "Fire Testing Experiences" at the CWCT technical meeting, and this seems to be dated 10 October 2014, Dr Sarah Colwell. Do you see that there?  Yes.  Then underneath we can see the objectives of the talk:  "Incidents.  "Mechanisms of External Fire Spread.
2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24	A. Yes.  Q. Now, in fact what we can see from the documents, we think, is that you did attend a CWCT AGM and members' meeting on 7 October 2014 at which Mr Jonathan Roome of Celotex was also present. I want to just pull up a document, this is {CEL00001037}.  Is it coming up on the screen?  SIR MARTIN MOORE-BICK: We've got it on the screen.  MS GRANGE: Ah, it's not on my screen, sorry. My screen is blank.  SIR MARTIN MOORE-BICK: Right. Perhaps we should get that sorted out.  (Pause)  Are you still blank?  MS GRANGE: My screen is blank so I can't see the document.  SIR MARTIN MOORE-BICK: No, no, you can't ask questions if you can't see the document.  MS GRANGE: It is a slight hindrance. My memory is good but not that good.  SIR MARTIN MOORE-BICK: I'm sorry about this, Mr Anketell-Jones. We get these very occasional blips.  (Pause)	2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24	Q. A. Q.	Yes.  If we look back at the top of this document for the meeting, we can see that the speakers include, second person down on the left, Sarah Colwell of the BRE, do you see that there?  Yes.  Now, her talk was entitled "Fire Testing Experiences" and appeared to go into considerable detail on fire testing for facades, including BS 8414 and BR 135. We have the slides for that talk and I want to show them to you.  If we can bring up {CEL00001038}. If we could zoom in to start with on the top half of that page. So we can see there that top left slide, the talk was called "Fire Testing Experiences" at the CWCT technical meeting, and this seems to be dated 10 October 2014, Dr Sarah Colwell. Do you see that there?  Yes.  Then underneath we can see the objectives of the talk:  "Incidents.  "Mechanisms of External Fire Spread. "Fire testing for Façades.
2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23	A. Yes.  Q. Now, in fact what we can see from the documents, we think, is that you did attend a CWCT AGM and members' meeting on 7 October 2014 at which Mr Jonathan Roome of Celotex was also present. I want to just pull up a document, this is {CEL00001037}.  Is it coming up on the screen?  SIR MARTIN MOORE-BICK: We've got it on the screen.  MS GRANGE: Ah, it's not on my screen, sorry. My screen is blank.  SIR MARTIN MOORE-BICK: Right. Perhaps we should get that sorted out.  (Pause)  Are you still blank?  MS GRANGE: My screen is blank so I can't see the document.  SIR MARTIN MOORE-BICK: No, no, you can't ask questions if you can't see the document.  MS GRANGE: It is a slight hindrance. My memory is good but not that good.  SIR MARTIN MOORE-BICK: I'm sorry about this, Mr Anketell-Jones. We get these very occasional blips.	2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23	Q. A. Q.	Yes.  If we look back at the top of this document for the meeting, we can see that the speakers include, second person down on the left, Sarah Colwell of the BRE, do you see that there?  Yes.  Now, her talk was entitled "Fire Testing Experiences" and appeared to go into considerable detail on fire testing for facades, including BS 8414 and BR 135. We have the slides for that talk and I want to show them to you.  If we can bring up {CEL00001038}. If we could zoom in to start with on the top half of that page. So we can see there that top left slide, the talk was called "Fire Testing Experiences" at the CWCT technical meeting, and this seems to be dated 10 October 2014, Dr Sarah Colwell. Do you see that there?  Yes.  Then underneath we can see the objectives of the talk:  "Incidents.  "Mechanisms of External Fire Spread.

1 "Summary and Questions." 1 presentation {CEL00001038/2}, we can see there's 2 2 Now, looking at this now, can you remember seeing a number of "Fire Spread in Building Envelopes" examples 3 that presentation at that CWCT meeting? 3 that are provided: there's Knowsley Heights which is in 4 4 A. No, I can't remember seeing it. Liverpool in 1991, Basingstoke in 1992, and then if we 5 Q. This is not jogging any kind of memory in terms of being 5 go one further down at the bottom of this page, we also 6 6 then in the bottom left have Irvine, the Garnock Court present? 7 7 A. No, I think, because I was focused on structural design fire which I asked you about yesterday. So that fire 8 8 at that point, that's where the focus of my CPD and was referred to in this presentation. 9 9 continued learning was focused. So without having the Again, they're striking images, aren't they, these 10 10 basis for a lot of these sorts of subjects, it probably pictures --11 didn't mean as much as the other things. So I can't 11 A. Yes. 12 remember seeing it. 12 -- of façade fires? Can you explain why you don't remember those from this CWCT conference? 13 13 Q. Do you think you might have been present at the talk and 14 14 just not concentrating on it because it wasn't your A. I can't explain why I don't remember. Either I was 15 15 sitting somewhere else or not sitting in the room, remit, or are you saying you weren't present at all? 16 16 A. I can't remember. I think I might have been there and I don't know. 17 not concentrating because it wasn't what I was trained 17 Q. They're not bringing back any recollection for you of 18 in and not part of my remit. 18 having --19 19 Q. Just picking you up on that, as a structural engineer, A. No. 20 20 wouldn't you have to have some knowledge of fire risks Q. -- attended this? 21 21 and of fire performance to perform your role as Then if we look at the top of the next page, page 3 22 22 a structural engineer? {CEL00001038/3}, we can also see that there's reference 23 23 A. Yes, of the structural components and what they were to other cladding fires internationally. There's 24 required to do in a fire. For the façade, it wasn't 24 reference to a fire in Dijon, France in 2010, and then 25 25 required to not melt, and that's basically where a whole list of recent high-rise external cladding 1 1 a structural -- what a structural engineer will look at fires, including towers in Dubai; the Mermoz, Roubaix in 2 2 is if there are any fire requirements from that point of France in May 2012; other Dubai cladding fires; 3 3 a Russian one; Istanbul, Turkey. view. Because if there's -- you know, sometimes we 4 4 design façades that are to stop fire from passing from Again, just in general terms, were you aware that 5 one side of the façade to the other side, like 5 there had been instances of cladding fires 6 6 a fire-rated curtain wall. In that instance, the internationally at this time? 7 7 bracketry and things that I would be designing would A. I don't believe so, no. 8 8 have to have a fire resistance, and you might have to Q. You don't believe so? 9 9 specify a steel bracketry to make that work. But for A. Well, I'm trying to cast my mind back, you know, 10 a façade like the one that was on Grenfell, there aren't 10 seven years. I can't remember knowing about them at 11 11 those requirements. that point. 12 Wouldn't, as a structural engineer, you be interested in 12 Q. Can you remember when you did become aware of 13 13 whether the façade materials might promote the spread of international cladding fires? 14 A. Probably when I went to the MSc in Bath where they -- in 14 fire across the walls? 15 15 the fire course, they covered a lot of these subjects A. So what I was doing was to make sure that it could stay 16 on the building for the time that was required and 16 there. 17 resist the loads that was required. So you would be 17 Q. And when would that have been exactly? I know it was

18

19

20

21

22

23

24

25

after you left Harley.

I think middle of 2016.

Then if we look at the bottom of this page, we've

got a section on "Mechanisms of fire spread", including

extracts from the diagrams you get in BR 135 about the

"Vertical Fire Spread". In fact, these are some

8

mechanisms of fire spread externally.

Q. Right, yes.

Q. I see.

"What is a façade?"

looking at how much the panels weighed.

Can we just look on within this presentation.

further down this page, there's a list there about,

Section 2 is about, "What is a Façade?" If we just go

Then the third topic appears to be "Examples of

External Fire Spread". If we go to the next page of the

18

19

20

21

22

23

24

If you see on that bottom right-hand slide, there's reference there to flames extending five to ten times the original length, so flame elongation. Yesterday you said you weren't aware of that phenomenon when you were working on the Grenfell project.

Again, does this help as to whether or not you might have known about that at this time, in 2014?

- 8 A. No. As I said yesterday, my knowledge at that time was 9 that you were always trying to stop unseen fire spread 10 so the Fire Brigade could focus on the fire, where it 11 was originating from.
- 12 Q. But the concept of flame elongation, you were positive 13 that's not something you were aware of; is that right?
- 14 A. No, it was just that the fire could spread behind the 15 panels and they wouldn't be able to see it.
- 16 Q. Yes.

1

2

3

4

5

6

7

17 Then topic 6, if we go to the next slide 18 {CEL00001038/4}, is about fire testing, and in 19 particular Sarah Colwell has focused on full-scale 20 system tests in this presentation, including 8414 tests. 21 We get a number of images which give a demonstration of 22 that type of testing. If we can look down again at the 23 next set of slides there, you can see there's reference 24 to the test duration, how long it runs for, what the 25 system is. Do you see that there?

1 A. Yes.

- 2. Q. Again, is this bringing back any memories in terms of 3 whether you were aware of these system tests? I think Δ yesterday you said you were barely aware that there was 5 an 8414 test?
- 6 A. Yes.
- 7 Q. Does this help as to whether or not you had more 8 knowledge than that in 2014?
- 9 A. I don't believe I did. As I said before, I was focusing 10 on the structural design, and on other projects that 11 I worked on, we'd always send this information off to
- 12 the fire consultant because I hadn't had any training in 13
- 14 Q. Okay. We'll come back to the fire consultant later.

15 Just staying with this presentation, if we can keep 16 going down this slide, we get more information about the 17 BS 8414 test and the testing method {CEL00001038/5}. 18 There's a full-scale video clip of an external cladding 19 fire test that appears to have been shown as part of the 20 presentation. We see that in the bottom right-hand 21 corner. Then if we carry on, there's information about 22 what information is recorded as part of these tests, the 23 output from them {CEL00001038/6}. Then again if we can 24 keep going, we get a summary of the classifications of

1 the bottom left-hand slide {CEL00001038/7}. Do you see 2 that there?

- 3 A. Yes.
- 4 Q. We see the front page of the publication. That was the 5 2013 third edition of BR 135 that's in that bottom 6

7 So, again, does this help as to whether you were 8 aware of BR 135 at this time in October 2014?

9 A. I was -- people mentioned it for, you know, saying that 10 certain things had passed the BR 135 test on other 11 projects, but because I wasn't trained in it, I'd always 12 send it off to people who were.

13 Q. Right.

14 Were you aware that BR 135 was relating to a system 15 test like this, a mock-up on a wall, as per these 16 photographs?

17 A. No, I don't think I was.

18 And then if we look at the very bottom of that page 6 19 {CEL00001038/6}, there's reference to the failure 20 criteria -- sorry, we get the failure criteria actually 21 in that top right box, "External fire spread", "Internal 22 fire spread", it explains what the failure criteria are.

23 Then there's a discussion of mechanical performance 24 in the bottom left-hand slide, and it indicates that: 25

"Details of any system burn through, collapse,

1 spalling, delamination or flaming debris should be 2 included in the test report."

Do you see that sentence there?

4 A. Yes.

3

5 Yesterday when I asked you, you said you weren't aware 6 of spalling and delamination as a feature of rainscreen 7 performance in fire. Does this help you as to whether 8 or not in fact you may have been aware of those 9 concepts?

10 A. The only concept I was aware of at that point was that 11 aluminium melted at quite a low temperature compared to 12 steel, and so in a fire, you know, there's a good chance 13 that the façade could melt and fall off.

14 Q. Yes.

15

16

17

18

19

20

21

22

23

25

Now, we've got some information about what Mr Roome's take-away points were following this day and the day generally, and I just want to look at an internal Celotex email. This is {CEL00001255}. If we can blow up the top half of that.

So this is not an email you would have seen at the time. This was an email from Jonathan Roome to a large number of his colleagues within Celotex dated 21 October 2014. He is reporting back and saying:

24 "Hi Team,

"As some of you may know I recently attended the

10

performance, and there's reference there to BR 135 in

1 CWCT Members Meeting up in London." 1 material? 2 2 Then he explains what the CWCT is. A. I can't remember this conference, so no. 3 3 Then he explains what the reason for attending was Q. But would you agree, looking at it now, that that was 4 4 in the next paragraph, and he says: pretty important material for cladding subcontractors, 5 "I met a number of people during the day and I have 5 cladding designers, to be aware of? 6 6 attached a list of attendees who you may want to A. 7 7 follow-up." Q. If, as you say, your remit was so narrow and limited to 8 8 So that was the list that we looked at at the structural considerations, can you explain why you were 9 9 attending a CWCT event of this nature including such beginning this morning. 10 10 Then he says this in the next paragraph: wide-ranging topics? 11 "The day was a mix of opinion and fact (And a lot of 11 A. No, I can't. 12 the opinion was pretty one-sided -- The use of 12 Q. Now, just picking up on some other points about your 13 non-combustible materials ONLY)!." 13 role from yesterday, were you ever provided with 14 14 And he's put that in capitals. a written job description while you were at Harley? 15 15 "A lot of people that I spoke to afterwards A. I think probably when I very first started with the --16 disagreed with a lot of what was said." 16 in my first role, I would have -- there would have been 17 Do you see that there? 17 a job description that I was applying for, but not to my 18 18 knowledge after that. A. Yes. 19 19 We can see one of his key take-away points that he's Q. So when you were promoted to the role of design manager, 20 reporting back to colleagues on is that there should be 20 do you recall getting a revised job description --21 non-combustible materials only in such façades. Do you 21 A. No. 22 22 Q. -- setting out your role? see that? 23 23 A. Yes. A. When that happened, we had some more designers in the 24 24 Q. Now, can you recall whether that was a point you came office, and Mark Stapley was my line manager. When 25 25 away with following that conference, that materials there became more designers, we needed to have a way of 13 1 1 should be non-combustible only? 2 2 A. I can't remember anything in relation to that 3 3 conference. 4 4 Q. Do you remember any discussions about whether people 5 agreed with whether non-combustible materials only 5 Q. I see. 6 6 should be used? Do you remember discussions during the 7 7 conference about compliance? 8 8 A. No, I can't. 9 9 Q. Were you involved in any such discussions, for example 10 with Mr Roome? 10

A. No. I wouldn't have -- I can't remember being there, to

Q. After attending an event like this, what would you do,

say, with the pack that you get at conferences, the

slides? What was your practice in terms of reporting

back to colleagues at Harley? Was that something you

A. Now when I go to them, the slides are usually sent out

leave that to Mark to send them out.

Q. Did you ever check with him that he sent out that

14

by email and I usually pass them on to my colleagues.

Back then, I think, because I was not directly connected

with them and more focused on structural design, I would

knowledge to be able to, you know, cast any opinions on

be honest, but if I was, I wouldn't have had the

trying to keep a track on their programme and making sure that they were keeping to their programmes, so it was my responsibility to do that, but it was never any more formally discussed than that.

> Now, Mr Bailey's evidence was that Graham Hackley left Harley at the end of 2012 and beginning of 2013, and you said yesterday that you weren't made technical manager until the end of 2015, beginning of 2016.

Can you help us as to who fulfilled the role of 11 technical manager at Harley for the period between 2013 12 and 2015?

13 A. There wasn't one.

14 O. Who at Harley had responsibility during that period for 15 ensuring that the designs of cladding systems complied 16 with the Building Regulations?

17 A. For the projects that I worked on, I would always pass 18 it back to the client and the design team working under 19 the client for them to confirm, so I'd send them the 20 drawings to check. On the responsibility to make sure 21 that that happened in the business as a whole I think

22 would fall to the directors.

23 So on the Grenfell project, can you help us as to who 24 that was? Who were you passing it back to? Who was the 25 design team that you were asking to check for

16

11

12

13

14

15

16

17

18

19

20

21

22

23

2.4

25

it .

routinely did?

2

3

4

5

1 compliance?

- $2\,$   $\,$  A.  $\,$  I wasn't passing it back to anyone because I wasn't
- 3 producing any of the design. For the structural design,
- 4 I would pass it back to -- I can't remember who was in
- $\,\,$   $\,$   $\,$  Rydon at the time, and ask that it was verified by their
- 6 structural engineer.
- $7\,$   $\,$  Q.  $\,$  So who was producing the designs for  $\,$  Grenfell  $\,$  and who  $\,$
- 8 was that being passed back to?
- $9\,$   $\,$  A.  $\,$  So Kevin was producing the designs,  $\,$  and he would have
- been passing that back to Rydon and their design team.
- 11 O. I see
- Now, I want to look at a passage from the transcript
- 13 yesterday --
- 14 SIR MARTIN MOORE-BICK: Sorry, just to interrupt you for
- 15 a moment.
- When you say passing it back to Rydon and their
- design team, who did you understand to be Rydon's design
- 18 team?
- 19 A. I think at the time my involvement was so limited that
- 20 it's only from looking back on it now, but I always
- 21 understood that there was an architect, a fire
- 22 consultant, Building Control, who would have been the
- 23 client's design team.
- $24\,$   $\,$  MS GRANGE: Why do you say Building Control was part of the
- design team? Was that Building Control's role?

17

- 1 A. I think quite often Building Control inputs into design
- and checks design. They don't report to Rydon. You
- 3 know, even in the past sort of three years
- 4 Building Control are usually shown a lot of the design
- $\,\,\,$   $\,\,$  in the process for them to comment on and to confirm
- 6 that it complies.
- $7\,$   $\,$  Q.  $\,$  And that was your understanding at the time, was it ,
- 8 that Building Control were part of the design team?
- 9 A. My understanding at the time would have been the same as
- all the projects that I had worked on, was that our
- client would be passing that information on to Building
- Control to check. But, yes, Building Control wouldn't
- $13 \qquad \quad \text{be reporting to the client} \, .$
- $14\,$  Q. They wouldn't be reporting to the client --
- 15 A. No.
- 16 Q. -- did you just say? Okay.
- Just going to something else from the transcript
- 18 yesterday, if we can pull this up, this was
- 19 {Day35/202:10}. So I was asking you there:
- "Were you aware that that was part of Harley'sresponsibility to consider the need for effective fire
- 22 barriers?"
- This is where I was asking you about the
- $24 \qquad \quad \text{Curtins Consulting specification that had been included} \\$

18

in Harley's subcontract. You say this:

"We would have known that we needed to put fire barriers in, we just wouldn't have known necessarily where they needed to go. We've relied on the fire consultant to tell us, as with other projects I had

Now, I want to ask you: what steps did you or Harley
have in place that you were aware of to ensure that you
got full advice from the fire engineer on the Grenfell
project?

- 10 A. On the Grenfell project, I couldn't tell you. On other
- 11 projects ,  $\, I \,$  would always make sure that  $\, I \,$  had sent the
- 12 firebreak elevations to them and that I'd always had
- 14 happy with what was shown.

worked on."

- Q. And why couldn't you tell us whether that happened on
   the Grenfell project if you were the design manager for
- 17 the project?
- $18\,$   $\,$  A.  $\,$  Because I was just making sure that Kevin was keeping to
- $19 \hspace{1.5cm} programme, and occasionally he'd send me things that \hspace{1em} I'd$
- $20\,$   $\,$   $\,$  pass through to Ray to check as well, but I think that
- was only at the very early stages. Later, once I was,
- you know, back focused -- well, just having to keep on
- $23 \hspace{1cm} \text{with my workload on other projects,} \hspace{0.1cm} I \hspace{0.1cm} \text{think} \hspace{0.1cm} \text{Kevin just} \\$
- 24 went directly to Ray.
- 25 Q. Kevin went directly to Rydon?

19

- 1 A. Ray, sorry.
- 2 Q. Ray, I see.
  - Was Kevin ever told, "You need to make sure you've got proper fire engineering input for your designs, this
- 5 is who you go to"? Did you ever have that discussion
- 6 with Kevin?
- 7 A. No.

3

4

- 8 Q. But you were line-managing him at the time; is that 9 correct?
- 10 A. I think that at the beginning I was for a couple of
- months, and then I was told to focus on other projects.
- So I had to keep up with the likes of the Trinity Square
- $13 \hspace{1cm} \text{project, and once there was a project manager appointed,} \\$
- he would have been reporting to him.
- 15 Q. I see.
- 16 I'm going to come back a little bit later and just 17 have a look at the extent to which you were inputting
- and supervising Kevin Lamb, so we'll park that for now.
   Just on the CDM Regulations now, what did you
- understand your duties under the Construction (Design
   and Management) Regulations to be during the Grenfell
- 22 project?
- 23 A. At that point I wouldn't have had any understanding.
- Q. Were you aware that, as a designer, you would owe duties
- 25 to your client and duties when preparing or modifying

2

3

4

5 A. No.

6

7

1 a design under the CDM Regulations?

- 2 A. Not under the CDM Regulations. I would have realised
- 3 that there was a duty to keep them informed and get
- 4 things approved, but that was mainly to do with other
- 5 projects.
- 6 Q. Did you ever have an awareness on the Grenfell project
- 7 that you would be categorised as a designer under the
- 8 CDM Regulations?
- 9 A. Not on the Grenfell project, no.
- 10 Q. Were you ever involved in any design risk analysis or
- 11 design risk assessments as part of a CDM process on the
- 12 Grenfell project?
- 13 A. Not on the Grenfell project, no.
- 14 Q. At the time of the Grenfell project, did you have an
- 15 understanding about the health and safety file under the
- 16 CDM Regs and what was required in relation to that?
- 17 A. Not on the Grenfell project, no.
- 18 Q. Did you understand that Harley would have to make
- 19 significant contributions to that health and safety file
- 20 under the CDM Regulations?
- 21 A. Not on the Grenfell project, no.
- 22 Q. When you say, "Not on the Grenfell project", have you
- 23 become aware at a later stage of your obligations under
- 24 the CDM Regulations?
- 25 A. Yes.

21

- 1 Q. Was that when the new regulations came in in 2015 or was
- 2 that after that?
- 3 A. No, that was in training that I've had after leaving
- 4 Harley.
- 5 Q. I see.
- 6 Did you have any training with Harley about the
- 7 CDM Regulations?
- 8 A. No.
- 9 Q. Now, the next topic I just want to explore is to
- 10 consider briefly what involvement you and Harley had in
- 11 the design process prior to being formally appointed on
- 12 the project; yes?
- 13 I want to turn, to start with, to a document
- 14 {ART00001487}, and what this is -- just to be clear,
- 15 you're not copied in here -- is an email from Mr Sounes
- 16 of Studio E on 27 September 2013 to a number of
- 17 18
- the Grenfell project, reporting back on a meeting with
- 19 Harley Curtain Wall this morning, do you see that in the
- 20 first line? It says:
- 21 "We met with Harley Curtain Wall this morning to
- 22 discuss the project. They are very keen and have been
- 23 tracking the project for some time. They are
- 24 specialists in this type of project ... They pointed to
- 25 Ferrier Point as ... being very similar to Grenfell ..."

22

- individuals at the TMO, Max Fordham, et cetera, about 17
  - 18 jumping forward to April 2014 now. This is
  - 19 {HAR00005711}. This is an email of 25 April 2014.
  - 21 bottom of that page from Kai Fabiunke of Studio E to
  - 22 Mark Harris. Do you see that there?
  - 23 A.
  - 24
  - 24

8 indeed point 1. 9 Do you remember ever being involved in discussions 10 about costings prior to the appointment?

Q. Now, it would appear that potential costings were

Then Mr Sounes has recorded a number of key points

Do you recall, were you present at any point during

discussed at that meeting, you can see from point 2, and

11 A.

12 Can we now turn to a document later in time,

arising from that meeting.

that meeting?

- 13 November 2013, this is  $\{HAR00006011\}$ . Now, this is
- 14 an email, if we blow it up, from Mark Harris on
- 15 7 November 2013 to Tomas Rek at Studio E, but copying in
- 16 Ray Bailey and Mike Albiston and others, Bruce Sounes,
- 17 Mark Harris at Harley. You're not copied in here.

18 In the bottom paragraph of that email, Mr Harris 19 says this in the second sentence of that last main 20 paragraph:

21 "I have to say, from a Harley selfish point of view, 22 our preference would be to use ACM. It's tried & tested 23 (on many Harley projects), and we are confident in the

24 cost base. That said, we are of course an envelope

25 contractor, and would be happy to clad the build in the

- 1 material of choice."
- Do you see that there? 2
- 3
- 4 Q. Did you at the time share that preference for ACM?
- 5 Would that have been your preference as one of Harley's
- 6 designers?
- 7 A. I would always go with what had been specified by the
- 8 architect. I didn't have any preference at all.
- 9 Q. Did you know that your colleagues at Harley were
- 10 expressing this preference at the time?
- 11 A. No.
- 12 Q. You weren't aware of that at all?
- 13 Were you aware that Harley was closely involved in 14 the selection of the Reynobond cladding panels?
- 15 A. No. From my point of view, it was in the specification 16 and it had been specified by the architect.
- Q. Can we turn now to an email again later in time. We're
- 20 So if we start, actually, with the email at the
- Yes.
- Q. In that email we can see what he's doing is attaching
- 25 some initial drawings of how he would like the cladding

1 to look. So he says: 2

"Hi Mark.

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

19

"As discussed earlier, please find attached a couple of 3D images showing the detail we would like to achieve on the ACM rainscreen cladding panels."

Then he goes into some detail about the column casings and the spandrel panels.

And then if you look at the second- and third-last paragraph on page 1, he asks, three paragraphs up there from the bottom:

"Could you please let us know if this could be done using the secret fixing system or if it has to be face fixed rivets. Would both fixing systems be within the

"If face fixed, what would the vertical centres of the T rails and horizontal centres of C channels need to be? If secret fixed, what would the vertical centres of the supports need to be?"

Do you see that?

20 A. Yes.

21 Q. And then scrolling up to the top email, and this is 22 an email that you are copied into, so this is back from 23 Mark Harris to Mike Albiston, copying you in, so this is 24 an internal Harley email, saying on 25 April 2014:

25 "Mike - can you save to the file .

1 "Our Dan will be taking a look at these on Monday." 2 Do you see that there?

3 A. Yes.

- 4 Q. Now, that's going to refer to you, isn't it, "Our Dan"
- 5 there, because you're copied into the email; is that
- 6 correct?
- 7 A. Yes.
- 8 Q. So at this stage, were you the person within Harley with
- 9 the design knowledge to provide answers to the sorts of
- 10 queries that we saw in that email?
- 11 A. From a structural point of view, yes, and from
- 12 a fabrication point of view.
- 13 Q. I see. But, again, do we ever see you saying, "I'm only
- 14 looking at this from a structural point of view"?
- 15 Did you ever say that back internally to your colleagues
- 16 within Harley?
- 17 A. At that point in my career, it was the only training
- 18 that I'd had. I had no other training in other areas
- 19 that were -- that would make me be able to make any
- 20 comment on it.
- 21 Q. So you think it was implicit that you wouldn't have been
- 22 able to advise any more broadly than that?
- 23 A. Yes. You know, this would have been looking at how this
- 24 would work structurally and whether it could actually be
- 25 fabricated into those shapes that they were asking for.

26

- Q. Did you give any consideration to whether ACM was
- 2 a viable option that could be used instead of zinc for
- 3 the cladding?
- 4 A. As far as I was aware, it was only ACM. That is what --
- 5 I've never thought any differently.
- 6 Q. So you were never aware that zinc was being considered
- 7 for this project?
- 8 A. Not that I can remember, no.
- 9 Q. Had you or Harley ever done any assessment to determine
- 10 whether the ACM was a compliant material choice for
- 11 Grenfell Tower?
- 12 I wouldn't have been responsible for looking at that.
- 13 Q. Who do you think might have been within Harley?
- 14 A. At that point, I would have thought everyone would have
- 15 assumed it had been done by the consultants, and it
- 16 would have been done, you know, as part of the tendering
- 17 process. I don't know, really.
- 18 Q. At the point at which Harley became involved in the
  - project and received the employer's requirements,
- 20 including the NBS and drawings from Studio E, did you or
- 21 anyone else at Harley take any steps to investigate the
- 22 work that Studio E had done?
- 23 A.

19

- 24 Q. Did you simply adopt the work that Studio E had done and
- 25 start detailed design or did you interrogate the work

- 1 that Studio E had done in order to check it for
- 2 compliance?
- 3 A. We'd have adopted it, you know, on the basis that they
- 4 had done all the checks beforehand.
- 5 Q. Yes.
- 6 Now, moving forward again in the chronology, this
- 7 is May 2014, if we can go to {HAR00005786}. If you can
- 8 blow up that top email. This is Mark Harris,
- 9 29 May 2014, to Deborah French, copying in others, and 10 you are copied into this email. Mark Harris says:
- 11 "Hi Deb
- 12 "Will need your assistance when you get back from 13 hols !!!
- 14 "See attached."
- 15 There's a mock-up draft in the attachments.
- 16 Then they say:
- 17 "We had a very positive meeting on site yesterday 18 with the Rydon team and the architect. Rydon are coming
- 19 to us on Monday 9th June to talk about the contract.
- 20 Is it possible for you to provide a response ..."
- 21 Do you see that there?
- 22 A. Yes.
- 23 Q. Were you present at that meeting on site? So if it was
- 24 yesterday per the email, it would have been on
- 25 28 May 2014 with Rydon and the architect. Do you recall

- 1 whether you were present?
- 2 A. At that point I was not ever involved in any estimating
- 3 work-winning. It wasn't until 2016 that I started to
- 4 make that move across. So, no, I don't believe I was.
- 5 Q. You don't have any recollection of going to site
- 6 in May 2014?

A. No.

- 8 Q. As we just noted, Mr Harris attaches a mock-up to that
- 9 email. Were you ever provided with that mock-up?
- 10 Sorry, you were; you're copied into it. Did you
- 11 ever look at that mock-up? Sorry.
- 12 A.

7

14

- Q. Now, if we go to {HAR00000978}. Again, moving forward 13
  - in time, this is now 6 June 2014. So this is an email
- 15 from Mark Harris, at the top of the page, to
- 16 Mike Albiston, ccing you on 6 June 2014. We can see
- 17 that what Mark Harris has done is forward an email from
- 18 Simon Lawrence sent on that same day, which is below.
- 19 Do you see that there?
- 20 A. Yes.
- 21 And what Simon Lawrence has done in that email is to
- 22 " clarify conversations between us all" and put some
- 23 action points into that email.
- 24 I want to look at the third bullet of this. He
- 25 says:

29

- 1 "Bruce to send Harley [drawing] Autocad file of the
- 2 Mock up draft so Harley design team can turn into
- 3 working drawing. This is then to be approved by Bruce."
- 4 Do you see that there?
- 5 A. Yes.
- 6 Q. Is Mr Harris forwarding you that email at the top
- 7 because you were part of the Harley design team at this
- 8
- 9 A. I was part of the Harley design team. I don't know why
- 10 he's forwarding it though.
- 11 Q. You were part of the design team but you don't know why
- 12 he's forwarding it?
- 13 A. No.
- 14 Q. Why are you puzzled as to why he was forwarding that
- 15 email if you were part of the design team?
- 16 A. Sorry, the question was: was he forwarding it to you
- 17 because he was part of the design --
- 18 Q. Because you were part of the design team.
- 19 A. I was part of the design team, but I don't know why he 20 was sending it to the design team.
- 21 Q. I don't understand. Why don't you know why he was
- 22
- sending it to the design team?
- 23 "... so Harley design team can turn into working
- 24 drawing."
- 25 Okay.

- 1 Q. So:
- 2 "Bruce to send Harley [drawing] Autocad file of the
- 3 Mock up ... so Harley design team can turn into working
- 4 drawing."
- 5 So he's recording a number of actions, and this one
  - is an action for Studio E to send the Harley autocad
- 7 file of the mock-up to Harley.
- 8 A. Yes.

6

- 9 Q. Then if you look at the top of the page to the email,
- 10 it's just forwarding it. Yes, if we can look at the top
- 11 of this page, what's happened is Mark Harris has sent it
- 12 to Mike Albiston and has cc-ed you.
- 13 So my question is -- I think you've answered -- you
- 14 were part of the Harley design team at this time, yes?
- 15 A. Yes
- 16 Q. But just one more time, why did you not understand why
- 17 this was being forwarded to you?
- 18 A. I think I just was not reading it correctly.
- 19 Q. Okay.
- 20 Do you know whether the Harley design team
- 21 considered the combination of the exterior components of
- 22 the external façade at this point in terms of their
- 23 compliance?
- 24 A. I don't believe so, no.
- 25 And why would that have been? Why not?

31

- 1 A. Because it wasn't a won job yet, I don't think. We were
- 2 probably getting requests from Mark Harris to look at
- 3 this or look at that. You know, look at the structural
- 4 design, look at producing a mock-up. You know, we were
- 5 just responding to his requirements.
- 6 O. I see.
- 7 A. We weren't having an overall look at it yet.
- 8 Q. Did the Harley design team consider fire performance and
- 9 compliance with fire safety standards at this point?
- 10 A. No.
- 11 Q. Let's turn on, then, later in time to August 2014. If
- 12 we can go to {SEA00011681}. This is an email dated
- 13 27 August 2014 from Neil Crawford to Kevin Lamb and
- 14 Simon Lawrence, and you're copied in, together with
- 15 Bruce Sounes. Do you see that there at the top?
- 16 A. Yes.
- 17 Q. And although you're only copied in, can you see that
- 18 it's addressed to Kevin and Daniel in that first line?
- 19 Yes. A.
- 20 So it appears to be addressed to you; do you agree? O.
- 21 Α.
- 22 Q. And we can see that he's proposing a call with the two
- 23 of you. So:
- 24 "Kevin/Daniel
- 25 "Following my initial observations I have expanded

30

- the comments slightly and marked up the drawings
   attached as I think this will be easier to discuss over
   the phone with the comments in front.
- 4 "Will call tomorrow morning to discuss as agreed.
- 5 "Regards
- 6 "Neil."
- We can see that the subject is "Grenfell Tower
- 8 Preliminary cladding drawings for comment", and attached
- $9\,$  to that are "Preliminary Drawing Set Comments". Can you
- 10 see that there?
- 11 A. Yes
- 12 Q. Can you remember, did that call go ahead with
- 13 Mr Crawford, following this email? He says he's going
- 14 to call tomorrow morning to discuss. Do you remember
- 15 that?
- $16\,$   $\,$  A. No, I don't remember really speaking to Neil at all , so
- 17 I don't know if he liaised directly with Kevin.
- 18 Q. So you don't recall ever speaking to Mr Crawford during
- 19 the Grenfell project?
- 20 A. I don't recall, no.
- 21 Q. Did you ever meet with him face to face?
- $22\,$  A. I think at the -- towards the end of  $2014\,I$  went to one
- or two design meetings. He may have been present there.
- $24\,$   $\,$  Q.  $\,$  As the design manager, were you providing design input
- in order to progress the project at this stage? So this
  - 33
  - 1 is 27 August 2014.
  - 2 A. No, I wasn't providing any design input; I was basically
  - 3 making sure that Kevin was keeping to programme and
- 4 making sure that -- probably making sure that Ray was
- 5 happy with what he was producing.
- 6 Q. Did you ever have a discussion with Mr Crawford or
- 7 anyone else at Studio E about whether Studio E
- 8 considered it their responsibility to check the drawings
- 9 of the façade for compliance with the
- 10 Building Regulations?
- 11 A. No.
- 12 Q. Did Mr Crawford or anyone else at Studio E ever say to
- you, "We're only checking your drawings for
- 14 architectural intent, ie we're not checking for
- 15 compliance"?
- 16 A. No.
- 17 Q. Did you ever tell anyone at Studio E that you or anyone
- else at Harley, including Kevin Lamb, were taking
- 19 responsibility for checking that the drawings were
- 20 compliant?
- 21 A. No.
- $22\,$   $\,$  Q.  $\,$  And what was your understanding at the time of  $\,$  whose
- $23 \qquad \qquad \text{responsibility} \quad \text{that was on the project?}$
- 24 A. As with the other projects, I would have assumed that
- 25 was the responsibility of the architect to make sure

- that the design was compliant and the Building Control
- $2 \hspace{1cm} \text{to check that design to sign it off.} \\$
- 3 Q. What about Rydon? Did you understand that Rydon were
- 4 checking the designs that Harley produced?
- 5 A. No, I didn't.
- 6 Q. You didn't understand they were doing that?
- 7 A. No.
- $8\,$   $\,$  Q.  $\,$  So did you have a positive  $\,$  awareness that they were not
- 9 checking them?
- 10 A. I didn't have an awareness that they were or weren't.
- It just would have been normal for the architect to be
- 12 checking them and Building Control to be signing them
  13 off
- 14 Q. Now, if we turn to paragraph 12 of your witness
- statement, this is {HAR00010149/3}, what you do in that
- $16 \hspace{1cm} paragraph \ is \ you \ explain \ what \ the \ different \ RIBA \ stages$
- of work were. You're explaining it by reference to the
- new RIBA stages, which are numbered, as opposed to the
- old ones which were letters, A, B, C, D, if you
- $20\,$   $\,$  remember. I just want to look at what you say at the
- $21\,$  very bottom of that paragraph in the last three lines ,
- 22 you say:
- 23 "Therefore, the Harley Project Designer would have nothing to do with concept design, material selection,
- or positioning of the components."

35

- 1 Do you see that there?
- 2 A. Yes.
- 3 Q. But would you accept, based on the exchanges I've just
- 4 shown you, that this is not correct and that, in fact,
- 5 on the Grenfell project, Harley did have a significant
- 6 input into the concept design and material selection,
- 7 including prior to its appointment?
- 8 A. Can we go back to those documents?
- 9 Q. Well, it's where I was showing you about Harley
- 10 expressing a preference for ACM material, which was one
- $11 \hspace{1.5cm} \text{of the alternatives} \hspace{0.1cm} \text{in the NBS specification} \hspace{0.1cm} . \hspace{0.1cm} \text{Do you} \\$
- accept that Harley played a significant role in terms of
- the choice of that material?
- 14 A. I think at the time I wasn't aware of that.
- 15 Q. I see.
- 16 A. So I couldn't say that they were having any effect on the concept design.
- 18 Q. Can I ask you to look at Kevin Lamb's witness statement
- 19 at paragraph 63. This is  $\{HAR00010419/16\}$ . If we can
- 20 blow that up.
- So in this paragraph 63, he's explaining about how the infill panels, the window infill panels, came to be
- selected. Do you know what I mean by that, when we talk

- about infill panels? They were the white panels in
- between the windows or the panel which housed the

1 1 extractor fan in the kitchens. originally? Do you agree that was Kevin's decision to 2 2 A. Okay. use that product? 3 3 A. I wouldn't know whose decision it was, but I would have Q. Do you recall that? 4 4 A. Not really, but I understand your explanation. thought all the materials should have been selected from 5 Okay. 5 the NBS specification. 6 6 Q. But do you agree that that's an assumption that you're He says this in the very end of that paragraph: 7 7 "The use of the Kingspan TP10 for P2 was my decision making, and that we actually need to look closely at the 8 8 as I have used this product over many years without documents to tell us in fact who was selecting the 9 9 issue." materials? 10 Now, the P2 panel was the one that housed the 10 A. Yeah, the statement from Kevin is saying that some 11 kitchen extract fan for the kitchen windows. You see 11 materials were being selected by members of Harley. 12 him saying that there? 12 0. Well, by him? 13 13 A. Yes. A. Yes. 14 "The use of the Kingspan TP10 ... was my decision as 14 Q. And he was the project designer, wasn't he? 15 I have used this product over many years without issue." 15 A. Yes 16 Before I ask you any questions about that, I just 16 Now, I want to ask you some questions now about the 17 want to show you another document. 17 appointment of Kevin Lamb. If we can go to paragraph 10 18 This is a copy of the Harley specification, if we go 18 of your statement first, this is {HAR00010149/2}. There 19 19 to {HAR00003866}. So this was the Harley specification you say this, you say: 20 20 notes for the external wall. "In respect of the Grenfell project, I was 21 21 What we can see is we've got some text, and then we temporarily made lead Harley contact for Rydon (the main 22 22 can see someone has put some red annotations on it. Do contractor) at the end of July/beginning of August 2014, 23 23 you see that there? this was because no one else was available. Rydon was 24 24 A. Yes. told I was the Project Designer; however, this was only 25 25 Q. And if we focus on the left -hand side, we can see that intended to reassure them whilst a project team was 37 39 1 for the glazing P1 panels, they're the main window 1 pulled together. My primary role was to appoint an 2 infill panels, the original author has put: 2. external designer as I did not have the capacity to take 3 3 "Core - 24mm Kingspan TP10 rigid insulation." on the project. It was not unusual for Harley to bring Δ 4 Do you see that there? in external designers to work on projects when there was 5 5 not enough internal design resource and this happened on A. Yes. 6 6 Q. Somebody has then annotated in red "25mm Styrofoam" next a number of projects." 7 7 to that. Do you see that there? Do you see that there? 8 8 A. Yes. 9 9 Q. Also, for the P2 panel, there's a comment "As above", do Q. Now, just going back and looking again at that paragraph 10 you see that there? 10 at the bottom of the previous page, I just want to ask 11 11 you about the phrase you've used there: A. Yes. 12 Are you aware that the red handwriting was 12 "... this was only intended to reassure them [ie 13 13 Mark Stapley's handwriting? Rydon] whilst a project team was pulled together." 14 A. I wouldn't be able to say whose handwriting it was. 14 Can you explain exactly what you mean by that? 15 15 Q. So our understanding is that Mr Stapley made these A. I think they wanted to make sure that there was somebody 16 16 annotations in red for the styrofoam panel. in Harley who was available to work on the project.

18 that and that this is Mr Stapley's writing, and bearing 19 in mind Kevin Lamb's evidence that he specified the 20 TP10, do you agree with me that some decisions as to 21 what materials to use in the façade were being made by

Now, just looking at that, and assume I'm right on

22 Harley during the project?

23 A. If that is by Mark Stapley, then yes, I would agree with 24

38

25 Q. And Kevin Lamb, the choice of the TP10 insulation 21 A. No, I don't. This was -- Mark Harris was dealing with 22 Rydon fully and just needed to put a name against the

Yes. Do you remember who was it at Rydon who wanted to

23 project.

17

18

19

20

24 Q. And so far as you were aware, did it in fact have the 25 effect of reassuring Rydon? Did Rydon appear to you to

40

Q. Rydon did?

A. Yes.

be comforted by the fact that you were being named as {HAR00006153}. This is an email chain from 2 2 the project designer? 19 June 2014, but I want to start with the email at the 3 3 A. I had very little to do with them at that point so bottom of page 1. So we pick that up at the bottom, 4 4 I don't know. Thursday, 19 June, Mark Harris to Rob Maxwell, copying 5 Q. Now, if we can then look at an email from Mr Harris 5 in Ray Bailey. 6 6 dated 31 July 2014 to Simon Lawrence at Rydon, this is Then if we go over the page to the top of page 2 7 7 {HAR00005916}. So if we can blow up the top of that {HAR00006153/2}, we can see that he is saying: 8 8 page. This is Mark Harris to Simon Lawrence, copying in 9 9 "To keep you in the loop, contract stuff is start to a number of individuals at Harley and Rydon, and you are 10 10 copied in here, we can see that. He says: hit us now on the Grenfell Tower front. 11 "Hi Simon 11 "Some of the items below and attached are for 12 12 "Lead designer will be Dan Anketell-Jones, with estimating ..." 13 13 brother Sam co-ordinating in the drawing office. We are Do you see that there in the first paragraph? 14 14 yet to appoint a project manager, but Rob will advise on A. Yes. 15 15 Q. Then he says: this in due course. 16 "Now that we are officially under way, could 16 "... however, there are many items which need 17 I suggest that emails regarding the design phase are 17 looking at by our proposed Grenfell House construction 18 sent to Dan, but copied to rob and Sam. 18 team, and therein lies the problem, we don't [bleep] 19 19 "I will deal with the commercial items with Zak." have one!!" 20 20 Do you see that there? Do you see that there? 21 21 A. Yes. A. Yes. 22 22 Q. Do you agree that this told Rydon that you and Sam would Q. So he's saying he doesn't have a proposed Grenfell House 23 23 be involved with the design of the façade? construction team. 24 24 A. Yes. Then he says in the next sentence: 25 25 And you would be the lead designer? "To say I'm concerned about this is an under 41 43 1 1 A. Yes. statement." 2 2 Q. Was that your understanding at the time, that that would Do you see that there? 3 3 be your role? 4 4 A. No, I was under the understanding that it was literally 0. 5 just a temporary stopgap, because I was far too busy on 5 6 6 another project. job ... not least because it would severely damage our 7 7 Q. And was that because Harley didn't have adequate design 8 8 resource at the time to cover the Grenfell project? 9 9 A. Yes, which is why we bought in external resource. 10 10 Q. Yes. doomed to fail." 11 11 Can you remember how long it was before you Do you see that there? 12 appointed Kevin Lamb? He said in his statement he was 12 A. 13 appointed in July/August 2014 -- that's at paragraph 11 13 Were you made aware of Mark Harris' concerns at the 14 of his statement {HAR00010419/2}. Can you help as to 14

16 A. I think it was almost straight away, because I didn't

17 have the time to look at it or work on the project. So

18 he had to be brought in, you know, immediately.

when he came on board?

19 Q. So was there a project designer before Kevin Lamb was 20 appointed?

21 A. I don't believe anyone did any actual design work before

22 Kevin started.

23 Q. Right.

15

1

24 Now, if we go to another email a little bit earlier 25 than this, just to see the back story to this, this is

42

Then the substantive paragraph just before the bottom:

"The last thing I want to do is walk away from the

relationship with Rydon, and worst still, would

potentially leave the door open for Tim Lovell & Co.

However, unless we can gear up and service it, [we] are

time? You're not copied into this email, but were you

15 aware how concerned he was about resourcing the Grenfell 16 project?

17 A. I don't think so.

18 Q. You don't think so?

19 Just describe the office at Harley. Is it 20 an open-plan office or is it -- were you separated out?

21 A. At that point it was -- there was sort of like two

22 offices, so it was all on one floor but there was sort 23 of a corridor down the middle, and mainly the design

24 team were in the  $\,\,$ -- in one office  $\,$  and everyone else  $\,$ was

44

25 in another office, and then Ray had his own office.

- Q. I see. So you wouldn't necessarily be aware of what 2 some of the commercial team were saying?
- 3 A. No.
- 4 Q. Then if we look at Mr Maxwell's reply at the top of
- 5 page 1 {HAR00006153/1} of this string, we can see that 6 he says:
- 7 "Mark [to Mark Harris, copying in Ray Bailey],
- 8 "We need to get an external design team on this
- 9 now."
- 10 Do you see that there?
- 11 A. Yes.

- 12 "I can pull in a project/site manager within a couple of
- 13 weeks, we could use Neal or Ben to attend a meeting ..."
  - So he's talking there about an external design team.
- 15 Is this concern regarding resources what prompted you
- 16 eventually to approach Kevin Lamb as the designer?
- 17 A. I don't know if it was in response to this. I just was
- 18 told that we needed to get somebody in to design
- 19 Grenfell. I imagine that the senior management decided
- 20 that it was better to get in someone external on
- 21 a contract rather than employ someone new.
- 22 Q. Yes.
- 23 A. So I was just asked whether I knew anybody. We'd had
- 24 a lot of problems with external design before, but
- 25 Harley had worked with Kevin, I'd worked for Kevin; we

- 1 were both confident that he could produce the work 2 required.
- 3 Q. Is it right that the only external person engaged by
- 4 Harley subsequently to service the Grenfell Tower
- 5 project was Mr Lamb?
- 6 A. Yes.
- 7 Q. Now, based on the references in this email string, we
- 8 saw in the string below this that there was reference to
- 9 needing a "construction team", and in this email he
- 10 talks about the need to get an "external design team".
- 11 Would you agree that the implication in these emails
- 12 is that a team of people, ie more than one person, would
- 13 be engaged, and that a single additional recruit
- 14 wouldn't be sufficient to deal with Harley's capacity
- 15 problems?

20

- 16 A. Usually one designer can do the detailing work and
- 17 another designer can do the fabrication work with --
- 18 depending on the programme, you can make it work with
- 19 one. I think we decided that, you know, just with
- Kevin, he could keep to the programme requirements. 21 Q. Does that mean that if resources hadn't been an issue,
- 22 you would have expected to have had two designers from
- 23 Harley working on the Grenfell project?
- 24 A. No, I think it was more to do with the programme.
- 25 I think that if you had enough time, one person could

- 1 cope with the workload.
- 2 Q. Were you satisfied at the time you appointed Kevin Lamb
- 3 that it was sufficient to just have one designer on the
- 4 project?

5 A. Yes.

- 6 Q. Even though you've just said, "Usually one designer can
- 7 do the detailing work and another designer can do the
- 8 fabrication work", you were satisfied that Mr Lamb could
- 9 do all of that?
- 10 A. I can't remember but it's -- the only reason you have
- 11 somebody doing design and someone else doing the
- 12 fabrication is because you're really pushed for time on
- 13 a programme. It would appear to me, looking back, that
- 14 we must have thought that one person could meet the
- 15 programme requirements.
- 16 Q. Yes.
- 17 Did you think that this issue of design resource was
- 18 being raised quite late in the project?
- 19 I think that it's quite normal to not know until the
- 20 very last minute whether you're going to get an order or
- 21 not, and you're never given any warning, you know, that
- 22 an order is necessarily going to be coming, or at least
- 23 I wasn't, so that you would literally have to find
- 24 resource when an order came in.
- 25 O. Yes. Okay.

47

- 1 So sticking with the theme of Kevin Lamb's
- 2 appointment and looking at paragraph 11 of your witness
  - statement, if we can bring that up, {HAR00010149/3}, you
  - say there:

3

4

5

- "I was involved in the appointment of the Project
- 6 Designer for the Grenfell project, Kevin Lamb. I had
- 7 worked for him previously in his company Bespoke Design
- 8 Services. I contacted him about the job. He was
- 9 interviewed by others and contracted to work for Harley
- 10 as the Project Designer in around July or August 2014."
- 11 Do you see that there?
- 12 A.
- 13 Q. You've explained already that Kevin had previously
- 14 worked on projects for Harley; that's correct, isn't it?
- 15 A. Yes.
- 16 Q. What was the nature of any projects he had been involved
- 17 in and, in particular, had he done any residential
- 18 high-rise projects for Harley before?
- 19 A. My understanding was that he'd helped with the
- 20 Chalcots Estate project early on with Harley. 21 Q. Helped in what way? Can you be more specific?
- 22 A. He'd helped with the design at the early stages.
- 23 Q. I see.
- 24 Can you recall what process you went through to
- 25 ensure that Kevin Lamb was a suitable designer to take

1 on the Grenfell project?

- 2 A. For myself, he was more competent than I was. He'd been 3 working in the industry for a lot longer than I was, and
- 4 then also he was known by the company. So he was -- he
- 5 understood how to do detailing and he understood how to
- 6 do fabrication.
- 7 O. I see.
- 8 Now, you say there as well that he was interviewed
- 9 by others. Can we just look at Mr Lamb's statement.
- 10 This is {HAR00010419/3}, paragraph 13. He says there
- 11 that he attended a meeting with Ray Bailey, the director
- 12 of Harley, and you on 12 August 2014, and that in
- 13 advance he was sent some details about Grenfell.
- 14 He goes on and explains at the end of paragraph 14 15 that they discussed attendance at a design team meeting
- 16 on site at Grenfell the next day.
- 17 So it appears there was a meeting with him to
- 18 discuss the project and then he was there the next day
- 19 on the project.
- 20 Is it possible that you were mistaken in your 21
- statement about whether you actually interviewed him? 22 Do you recall now interviewing him on 12 August 2014?
- 23 I would have contacted him before by phone. We would
- 24 have -- we'd sort of loosely kept in contact since I'd
- 25 left working for him, so I would have probably called

- 1 him about the job and discussed it, what was involved,
- 2 what the programme was, and then would have wanted him
- 3 to come in and meet Ray. I would have seen that as --
- 4 rather than being -- I knew him, I didn't have
- 5 a requirement to interview him, so I saw the interview
- 6 as being by Ray.
- 7 Q. I see. Did it feel like an interview that Ray did with
- 8
- 9 A. I can't remember this meeting, to be honest.
- 10 Q. Do you remember whether any information was sought,
- 11 either by you on the telephone in advance of the meeting
- 12 or at this meeting, about any relevant qualifications
- 13 that Mr Lamb held?
- A. No, I don't.
- 15 Q. You don't have a recollection of that?
- 16 A. No.
- 17 Q. Do you think it's likely that someone would have asked
- 18 about his qualifications, knowing Harley --
- 19 A. For myself, I always understood that he had a degree in
- 20 civil engineering and that he'd worked in the industry
- 21 for a long time. He'd worked for some of the large
- 22 façade companies -- or façade supplier companies, and
- 23 he'd had his own business for a long time.
- 24 Q. Right.
- 25 Did you ever discuss with him whether he would be

50

- 1 comfortable working on a large-scale façade project
- 2 without direct supervision?
- 3 A. No.

6

- 4 Q. Did you take into account that Harley would have
- 5 responsibility for the detailed design of the façade,
  - and therefore it was of importance that Kevin Lamb had
- 7 the knowledge and experience to undertake this task?
- 8 A. The parts that I was -- believed that we were ultimately
- 9 responsible for, I believed that he was capable of
- 10 providing
- 11 Q. Did you think that the task he would be engaged in would
- 12 require a knowledge of the Building Regulations and
- 13 associated guidance?
- 14 No, because I thought that that would be covered by the
- 15 architect and checked off by Building Control.
- 16 Q. So does it follow that you didn't assess his capability
- 17 in terms of understanding of the Building Regulations
- 18 and associated guidance around external façades?
- 19 A. No, because that would be put back to the people who did
- 20 have that training.
- 21 Q. Now, if we can just look at Mr Lamb's quotation and
- 22 scope of works, this is at {HAR00010415}. So this was
- 23 the quotation that Mr Lamb came up with to Harley. It 's
- 24 for the attention of you, we see that on the left -hand
- 25 side underneath the address of Harley, and it's dated

51

- 1 12 August.
- 2 He says:
- 3 "Dan
- 4 "Further to your email 07.08.14 and our meeting this 5 morning, please find below our quotation for design
  - services to the aforementioned project."
- 7 Do you see that there?
- 8 A. Yes.

6

- 9 Q. Then if we can look at page 6 {HAR00010415/6} and the
- 10 terms and conditions that were proposed, under
  - " Liabilities ", we can see point IV, the last point under
- 12 " Liabilities ", it says:
- 13 "All information as supplied by Bespoke Design in
- 14 good faith, should be checked for errors and general 15 conformity."
- 16 Do you see that there?
- 17
- 18 Q. Can you help us as to what quality control procedures
- 19 Harley had in place to ensure that Kevin Lamb's designs
- 20 were checked for errors and general conformity?
- 21 A. I think, from Harley's point of view, he was working as 22 a Harley designer, so the company would have been
- 23 working on the pretence that he was responsible for it
- 24 and wouldn't have done that.
- 25 Q. Does that mean there weren't any quality control

- 1 processes in place to check Kevin Lamb's design work?
- 2 A. No.
- 3 Q. No, there weren't?
- 4 A. No, there weren't.
- $5\,$   $\,$  Q. Now, if we can look at another email around this time,
- $6 \hspace{1cm} \{SEA00011528\}, this is \hspace{1cm} an \hspace{1cm} email \hspace{1cm} of \hspace{1cm} 15 \hspace{1cm} August \hspace{1cm} 2014. \hspace{1cm} So \hspace{1cm}$
- 7 if we can blow this up.
- 8 Sorry, actually, the one I want is at the bottom of
- 9 page 1 and over from page 2. It's from you to
- 10 Mr Lawrence on 15 August 2014 at 16.04. Do you see it
- beginning at the very bottom of that page?
- 12 A. Yes.

- 13 Q. Then if we can go over to the top of page 2
  - {SEA00011528/2}, it's ccing in Kevin Lamb and Rob
- 15 Maxwell:
- 16 "Good Afternoon Simon,
- ${\it 17} \qquad {\it "Following on from the meeting on Wednesday; I would}$
- 18 just like to confirm that Kevin will be the main
- designer working on Grenfell Tower."
- 20 Do you see that there?
- 21 A. Yes.
- 22 Q. Then you say:
- $23\,$  "We are keen to get on with the design as quickly as
- possible, and therefore will proceed with champagne
- 25 cassettes as discussed.

53

"We are going to focus on the details around the
windows, which will allow us to finalise the extrusion
design as quickly as possible.

"If you could send over the drawings submitted for planning this would be a great help. We want to be sure, all the right specs are on the drawings to start with, and get as much signed off and agreed as we can."

8 And then you've signed off on that. Do you see that 9 there?

10 A. Yes.

4

5

6

7

- $11\,$  Q. Do you agree that you haven't stated in this email that
- you would be leaving the project or only involved from
- 13 time to time?
- $14\,$   $\,$  A. No, I think by stating that Kevin was going to be the
- main designer, it would have been clear.
- 16 Q. But the way the email is worded, you then say:
- "We are keen to get on with the design as quickly aspossible ...
- 19 "We are going to focus on the details around the 20 windows ..."
- Wouldn't that have conveyed or weren't you looking to convey that there was a design team and you were part
- 23 of that design team at this time?
- A. I think it was just trying to speak as Harley, not asa design team.

- 1 Q. Did you intend to give the impression that you would
- 2 remain fully involved with the project?
- 3 A. No
- $4\,$   $\,$  Q.  $\,$  Did you ever explain to  $\,$  Rydon that you would only have
- 5 minimal involvement in the project going forward?
- 6 A. No.

9

- 7 Q. Right. Why was that not explained?
- 8 A. It was explained to me at the beginning by Mark that it
  - was just a stopgap, and I think that I thought that he
- would have told that to the client as well.
- $11\,$   $\,$  Q.  $\,$  I see. So you're saying you assumed that Rydon was told
- that your involvement would diminish; is that right?
- 13 A. Yes. I didn't see it as my place to tell them that. It
- would have been up to either Ray or the project manager.
- 15 Q. Did you consider that you would be able to carry out
- 16 your supervisory responsibilities for Kevin Lamb given
- that you've said in your statement you would often be
- dipping in and out of the Grenfell project?
- 19 A. Yes, because my responsibilities were to make sure he
- $20\,$  was sticking to programme, and if he wasn't, to try and
- get some help for him.
- 22 Q. Was it ever explained to you that your supervisory
- 23 responsibility for Kevin Lamb was limited to just the
- 24 programme?
- 25 A. It was what I did with all of the designers, was limited

55

- 1 to that. There were designers who were more experienced
- 2 than me. It was never stated that I needed to be
- $3 \qquad \quad \text{checking any more than their } \text{programme requirements and} \\$
- 4 that the resource was covered.
- 5 Q. Did you ever become concerned on the project that
- 6 Mr Lamb might be undertaking design work without
- 7 adequate supervision?
- 8 A. No.
- 9 Q. Did you consider that you had adequate and sufficient
- 10 time to properly supervise the design work on the
- 11 Grenfell project?
- 12 A. I wasn't supervising the design work.
- 13 Q. So nobody was supervising Kevin Lamb?
- 14 A. He would have been reporting to the project manager. He
- would have been in contact with the managing director
- and the contracts manager.
- 17 Q. But was anyone actually supervising the design work he
- was doing as the project designer?
- 19 A. He was liaising with the managing director, so I think
- $2\,0\,$  he would have been seeing his design from that point of
- 21 view.
- 22 Q. Are you saying Ray Bailey looked over his designs?
- 23 A. Yes
- 24 MS GRANGE: Mr Chairman, I think that's an appropriate
- 25 moment for a break.

54

SIR MARTIN MOORE-BICK: Is that convenient? 1 here by the architect? 2 2 MS GRANGE: Yes, it is. A. Because I had my own other project that I was working 3 SIR MARTIN MOORE-BICK: Yes, all right. 3 on, it would have been only a very brief look at it. 4 4 Well, we'll have a short break now, Q. Now, we can see in that top section which begins, "To be 5 Mr Anketell-Jones. We'll come back at 11.35, and please 5 read with preliminaries/general conditions", the second 6 6 remember not to talk to anyone about your evidence or bullet down says: 7 7 anything to do with it while you're out of the room, all "The manufacturers noted within this specification 8 8 right? are indicative and may be substituted with similar or 9 9 THE WITNESS: Yes, sir. equal alternatives." 10 10 SIR MARTIN MOORE-BICK: Thank you. If you would like to go Do you see that there? 11 11 with the usher, please. A. Yes. 12 (Pause) 12 Were you aware in general terms of that on the Grenfell 13 13 project, that the NBS had said, certainly for the Right, 11.35, please. 14 (11.20 am) 14 cladding, that the specification was indicative and that 15 (A short break) 15 there could be substitution with similar or equal 16 (11.36 am) 16 alternatives? 17 SIR MARTIN MOORE-BICK: Right, Mr Anketell-Jones, all ready 17 A. I think I wasn't aware of this on this one. The only 18 18 times that I would have been aware of this is if, on to carry on? 19 19 THE WITNESS: Yes. another project, that it was a performance specification 20 20 rather than a prescriptive one. SIR MARTIN MOORE-BICK: Thank you very much. 21 21 Yes, Ms Grange. Sorry, the only times you would have been aware of this 22 22 MS GRANGE: Thank you. would be on another project that it was a performance 23 23 I'm going to ask you some questions now about the specification rather than a prescriptive one; that's 24 24 NBS specification on the project, and then I'm going to what you just said, yes? 25 25 turn to the topic of insulation, which will probably A. Yes. 59 1 take the rest of this morning, just in terms of where 1 Q. So what type of specification did you think the Grenfell 2 2 we're going. project was? 3 So on the NBS specification, can we turn that up. 3 A. A prescriptive one. 4 4 This is at {SEA00000169}. This is the NBS specification Q. Can we look at the bottom of this page, section 11 there 5 for the Grenfell project which formed part of the 5 it says: 6 6 employer's requirements in Rydon's main project. Do you "Information to be provided with tender. 7 7 see that there? "In addition to the cladding specified in the below 8 8 clauses 120 & 123 submit comparative supply and install costs per m2 of the whole cladding system for the 9 9 Q. Is that a document you're familiar with? 10 A. I'm familiar with it now; at the time I think I was only 10 following alternative materials ..." 11 11 familiar with it in very brief sort of passing. And we have Reynobond Duragloss, and some finishes 12 12 given there; Alucobond, Spectra; Zinc, Quartz Zinc, Q. I see. 13 Let's look at page 63  $\{SEA00000169/63\}$  in this 13 panels by VM zinc. Do you see that there? 14 document. This is section H92, which begins the 14 A. Yes. 15 15 rainscreen cladding section. Do you see that there? Q. Were you aware that the NBS specification had a main 16 16 zinc panel specified but then had put in these A. Yes. 17 Q. If we go on to page 64 {SEA00000169/64}, we can see the 17 alternatives? 18 introductory parts of that H92 section. 18 A. No, I wasn't. 19 19 Now, is this a section that you would have read in You weren't aware of that? 20 your capacity as design manager on the Grenfell project? 20 A. No. 21 A. Because I was only looking to manage Kevin's time and 21 Q. Do we go back to your answer that you gave previously, 22 22 make sure he was keeping to programme, I would have only that the only product you were aware of for the cladding 23 23 probably looked at this very briefly. was the Reynobond; is that correct?

24 A.

25

60

Q. Would you agree, looking at that, that whilst it may be

Q. Would you not have been interested to see what products

had been specified, what standards had been specified in

24

1 1 prescriptive in the sense that you've got some products "Answer: Yes. 2 2 specified there and you've got to do similar or equal "Question: They did? 3 3 alternatives, it's not wholly prescriptive, is it? It's "Answer: Yes. 4 4 "Question: Who was that? not saying: you must use this one product. 5 Because this is at the beginning, I would have thought 5 "Answer: It would have been Daniel." 6 6 there was another section later on that said what the Do you see that there? 7 7 product should be, but as this was to be provided with A. Yes. 8 8 the tender, I would have thought that this had all been Q. Now, can you explain why Mr Bailey was saying that it 9 9 done during the estimating stage. was your job to check, and that he understood you had Q. I see. 10 10 checked, the NBS specification for compliance? 11 11 A. I think that the timeline -- timeframes might be Did you analyse the design that was provided for in 12 the NBS specification and in Studio E's drawings that 12 confused, because at this point I wasn't educated in 13 13 were provided as employer's requirements for compliance anything to do with these things, so I wouldn't have 14 14 with relevant regulatory requirements, including the been able to check. I think he might be confusing that 15 15 Building Regulations and associated guidance? maybe it was after I'd attended more of the MSc and had 16 16 A. No, because I was only responsible for looking after studied some of these things. 17 Kevin's time and making sure he was keeping to 17 Q. I see. So you think he's mistaken? 18 18 programme. A. Yes. 19 19 Q. Were you aware whether Kevin Lamb did this as the main And you're clear, are you, that you never analysed the 20 20 NBS specification for compliance? project designer? 21 21 A. No, I wasn't. Α. 22 22 Q. Would you have expected Kevin Lamb to have done that? Q. And you weren't aware of Kevin Lamb ever doing that? 23 23 A. I would have expected him to be familiar with everything No, I wasn't aware of him ever doing that, no. 24 in here, but I would have expected the compliance of the 24 Q. Can we look at another passage from Mr Bailey's 25 25 product with the Building Regulations to have been done evidence. Stay with Day 32, if we go up to pages 25 and 1 1 by Rydon's design team and Building Control. 26, and I just want to pick it up at maybe line 11 on 2 2. Q. So is it right that you didn't expect that anybody page 25 {Day32/25:11}: 3 3 within Harley would have gone through the process of "Question: How many of those employees would have 4 Δ checking the NBS specification and Studio E's drawings been required, as part of their job, to consider the 5 for compliance with the relevant regulatory 5 fire performance of specified materials in relation to 6 6 requirements? any particular project? 7 7 A. On other projects I was working on, it would always be "Answer: I -- in terms of ... what the design 8 8 that those checks had been done by the architect and office generally do is if the products have 9 9 that Building Control had signed it off, and on those a certificate that says they're class 0, they rely on 10 projects I would check that that had been done. 10 that, so it's -- anybody working at the design office 11 11 Q. But on the Grenfell project, is it right that you will look at -- once the certificate 's been looked at, 12 weren't expecting that anybody within Harley would have 12 and the product is accepted, they will use it. We don't 13 13 look at every product every time. Once it's been used gone through the process of checking the 14 14 NBS specification and the drawings for compliance? and been signed off, we will use it on another project 15 15 without --16 16 Q. Can we just look at Mr Bailey's evidence from last week. "Question: Right. 17 If we can pull up the transcript, this is 17 "You refer to a design office. Who was the design 18 {Day32/51:4-13}. 18 office, or who comprised the design office, as at 2013 19 19 So I want to pick it up at the fourth line. So this to 2014? 20 is Mr Millett saying to Mr Ray Bailey: 20 "Answer: 2013/14, it was -- Dan was in the design 21 "Question: Just take the NBS specification, okay: 21 office, Mark Stapley was in the design office, and there

62

22

23

24

25

A. Yes.

did anybody at Harley analyse the materials and products

contained in the NBS specification so far as concerned

the cladding to check whether it complied with the

relevant statutory requirements?

22

23

24

25

were another four designers in our in-house design

office at that stage."

Do you see that answer?

Q. So that line of questioning began with the question: and on site copies of: 2 2 "How many of those employees would have been "The Centre for Window and Cladding Technology 3 3 (CWCT) 'Standard for systemised building envelopes'." required, as part of their job, to consider the fire 4 4 performance of specified materials in relation to any Do you see that there? 5 particular project?" 5 A. Yes. 6 6 Q. That standard is actually referred to in several places And it ends up with it being said that you and 7 7 Mark Stapley, as part of the design office, would have within this NBS specification. It's also referred later 8 8 been required to consider that. in clause 310. 9 9 Do you agree that that was part of your remit in the Can I ask you to turn that up now. It's 10 10 Harley design office at this time, to consider the fire {CWCT0000046}. This is it. We know it's 11 performance of specified materials in relation to any 11 dated March 2008, I think. 12 particular project? 12 Were you aware that the NBS specification on the 13 13 Grenfell project required compliance with this CWCT A. So on the projects that I would be working on, I would 14 14 always send off the technical information for the 15 15 materials to get it approved by that particular A. No. 16 16 project's design team and Building Control. So you Q. So that wasn't something you picked up from reading the 17 would consider it from that point of view, but you 17 NBS specification? 18 weren't educated to be able to assess it yourself. 18 A. No. 19 19 Q. I see. Did you do that on the Grenfell project? Q. And it wasn't something you discussed with Kevin Lamb? 20 20 A. No, because I wasn't the main designer. I did that on A. No. 21 21 the projects that I was the main designer on. Q. Sorry, it's actually dated September 2008, 22 22 Q. So who would you have expected within Harley for the not March 2008. That was my error. 23 23 Grenfell project would have considered the fire Had you ever come across this document at the time 24 24 performance in the limited way you've just explained? of the Grenfell project? 25 25 A. I would have expected it to have been the designer to A. I can't remember. I became very familiar with it during 67 1 1 have checked that the products that were going on to the the time of doing the MSc at Bath. But I can't remember 2 building had been checked by the architect and 2 knowing much about it before then. 3 3 Building Control. Q. Do you recall consulting this document at the time of 4 4 Q. And the designer there, are you referring to Kevin Lamb? the Grenfell project? 5 5 A. No. A. Yes. 6 6 Q. Do you ever recall having a conversation with Mr Lamb O. Okav. 7 7 that it was part of his job to be checking that the I want to look now at the topic of insulation and 8 8 products were compliant by making sure the architect and explore that in a little more detail, and the process of 9 9 Building Control had checked that? selecting the insulation which was used on the tower. 10 10 If we can start with paragraph 21 of your witness A. No. 11 statement, this is {HAR00010149/5}. So paragraph 21, 11 Q. How would Mr Lamb know that that was part of his job? 12 From working with him previously and having done that 12 you say: 13 with him previously, I would have expected him to have 13 "I have no specific memory of the design as my 14 known that. 14 involvement in the Grenfell project was rather limited 15 15 Q. Okay. (most of my time was taken up with working on other 16 16 projects ...)" Now, if we can go back to the NBS specification, if 17 we look on page 68 at item 220 (SEA00000169/68). If we 17 Then four lines down you say: 18 look there, this is still within the H92 rainscreen 18 "From my reading of media reports and review of 19 19 cladding section, and this item 220 is headed Studio E and Harley drawings brought to my attention, 20 "Specification" and it says: 20 I can see that it was a traditional rail system with 21 "Compliance standards: The Centre for Window and 21 hook on cladding panels for the rainscreen and 22 22 Cladding Technology (CWCT) ..." a phenolic insulation used for the thermal performance." 23 23 It then says in the second bullet: Do you see that there? 24 24 "Reference information: For the duration of the A.

25

contract, keep available at the design office, workshop

25

Q. So does it remain your evidence that you have no 68

- $1 \qquad \quad \text{recollection } \text{ from the time about the products that were} \\$
- 2 used and that you only became aware of the products
- 3 being used from media reports?
- 4 A. Prior to having these conversations and looking at the
- 5 stuff in the media, I couldn't remember -- I wouldn't
- 6 have been able to recall what was on the building.
- 7 Q. Did that apply to the insulation, that you couldn't
- 8 recall what was on the building in terms of insulation?
- 9 A. Yes.
- $10\,$  Q. Now, you talk there about the phenolic insulation being
- $11 \hspace{1cm} \text{used for thermal performance, in the third line from the} \\$
- 12 bottom and the second line from the bottom there.
- 13 Did you realise at the time that the Celotex product
- 14 that was used as the main insulation, RS5000, was a PIR
- insulation, not a phenolic insulation. So it was
- a polyisocyanurate insulation?
- 17 A. No.
- 18 Q. You weren't aware of that at the time?
- 19 A. No.
- $20\,$   $\,$  Q.  $\,$  Then at paragraph 22, in the next paragraph of your
- statement, you say this in the first lines:
- 22 "As far as the manufacture of the cladding and
- $23 \qquad \quad \text{insulation is concerned I have no specific memory of} \\$
- 24 this. Having read media reports and material related to
- 25 this case; I understand that Celotex was used for the

- 1 insulation and Reynobond Aluminium Composite
- 2 Material ... for the cladding."
- Then you also understand that Siderise products were used.
- Now, if we can turn back to the NBS specification at {SEA00000169/73} and look at item 776 at the top of the
- $7\,$  page. So this is, again, within the H92 section of the
- 8 NBS specification .
- 9 A. Yes.
- Q. Here we can see item 776 is the thermal insulation, and
- $11 \hspace{1cm} \text{we can see \ if \ we keep reading down that that, \ after \ the}$
- second bullet point, there's a little indented line and
- 13 then it says:
- "Product reference: FR5000 ..."
- Do you see that there?
- 16 A. Yes.
- 17 Q. Above that was:
- 18 "Manufacturer: Celotex Ltd ..."
- Do you see that there?
- 20 A. Yes.
- $21\,$   $\,$  Q.  $\,$  Do you remember noticing in the NBS specification  $\,$  that
- the insulation that had been specified for
- Grenfell Tower was the Celotex FR5000 product?
- $24\,$  A. Not looking back on it , I can't remember, no.
- 25 Q. Does it remain your evidence that you have no specific

- 1 memory of the manufacturer of the insulation?
- 2 A. Up until I was -- you know, until it came out in the
- 3 media, I wouldn't have been able to tell you before that 4 happened.
- 5 Q. Now, we know that the product that was in fact used on
  - the tower was RS5000, a Celotex product. Do you agree
- 7 that there was therefore a change in the specification
- 8 from FR5000 that we see here to RS5000?
- 9 A. Yes.

6

- 10 Q. Do you have a memory of that occurring on the project,
- 11 there being a change in the specification between FR and
- 12 RS5000?
- 13 A. No.
- 14 Q. Were you aware of anyone at Harley considering the
- suitability of the FR5000 product for the Grenfell
- 16 refurbishment?
- 17 A. No.

22

- 18 Q. Would you have thought that was part of Kevin Lamb's
- $19 \hspace{1cm} \text{responsibility as project designer, to consider the} \\$
- 20 suitability of FR5000?
- 21 A. I would have thought it was the responsibility of the
  - architect and Building Control.
- 23 Q. Does that mean that they could say put anything on the
- 24 building and Harley would just build it? How far does
- 25 that go?

71

- 1 A. Generally it goes that if they put something in the
- 2 specification, we obtain the datasheets and submit them
- 3 back for approval, and if they approve them, then we
- believe that they're right to be used. Because in
- 5 things like fire, there wasn't anyone working at Harley
- 6 who was trained in that at that time.
- 7 Q. Wouldn't you even --
- 8 A. So if it was something structural that I understand --
- 9 understood more about, I would challenge them on it and
- argue it if I believed that it was wrong. But when it's
- something that you're not trained in, you have to rely
- on the expertise of the people who are trained in it.
- Q. Does that mean that there wouldn't even have been
- a cursory examination within Harley of the fire
- performance of the material?
- 16 A. Not that was required. I would do it on other projects
- that -- I would try and read it and see if it was my
- understanding of being compliant, but I'd always refer
- 19 it back
- 20 Q. So did anyone do that on the Grenfell project? Did
- anyone do a cursory examination of the material
- specified for the insulation to check that it had basic
- 23 compliance?
- 24 A. I think prior to -- I think at the point that Harley was
- at when this was going on, this was always done early on

- 1 because we had a technical manager who was part of the 2 estimating department who was trained in these things,
- 3 and I think at this point there wasn't anybody in the
- 4 business who could do that. So we did it individually
- 5 by satisfying ourselves as well as we could by passing
- 6 it back, but I don't think there was a particular
- 7 company policy that you had to follow.
- 8 Q. So does that mean that, as far as you're aware, no
- 9 cursory examination of the fire performance of these
- 10 materials was done by Harley?
- 11 A. Not as far as I'm aware, no.
- 12 SIR MARTIN MOORE-BICK: Help me with this: when you say
- 13 "passing it back", can you just explain exactly what you
- 14 mean, for example, in relation to insulation?
- 15 A. So you would -- it would be a prescriptive specification
- 16 and you would then go and obtain the datasheets from the
- 17 supplier, and then you would send that to the client's
- 18 design team and Building Control for approval.
- 19 SIR MARTIN MOORE-BICK: And the client's design team in this
- 20 case being?
- 21 A. It would be the architects, structural engineer, fire
- 22 consultant.
- 23 SIR MARTIN MOORE-BICK: And did you do that?
- 24 A. I wasn't the design manager on it -- sorry, I wasn't the
- 25 designer on it.

- 1 SIR MARTIN MOORE-BICK: Do you know if anyone else did that?
- 2 A. No.
- 3 SIR MARTIN MOORE-BICK: You don't know or you know they
- 4 didn't?
- 5 A. I don't know if they did or didn't.
- 6 SIR MARTIN MOORE-BICK: Thank you.
- 7 Sorry, Ms Grange,
- 8 MS GRANGE: Did you ever tell Kevin Lamb that it was part of
- 9 his responsibilities to be doing that?
- 10 A. I think, because I had worked with him before and that
- 11 was what we had done before, I was under the expectation
- 12 that he knew that that was what was required.
- 13 Q. I see.
- 14 Let's look at a document now relevant to the
- 15 insulation. This is {CEL00001237}. So this is an email
- 16 from Jonathan Roome of Celotex to Ben Sharman at
- 17 Harley Curtain Wall on 6 August 2014. So this is before
- 18 Kevin Lamb's appointment, yes, when you are holding the
- 19 fort -- is that right? -- on the project?
- 20 A. Pardon?
- 21 Q. You're holding the fort, aren't you, at this point on
- 22 the design work on the Grenfell project, August 2014?
- 23 A. Yes, I'm not sure when Kevin -- when we were talking
- 24 to -- yes, but, yeah, I was holding the fort as you put
- 25 it .

- Q. So in the email we can see that Jonathan Roome says to 2 Ben Sharman:
- 3 "Hi Ben,
- 4 "Good to speak to you again.
- 5 "I have the pleasure of informing you as of
- 6 yesterday we have now launched the first PIR Board To
- 7 Successfully Meet The Performance Criteria In BR 135 For
- 8 Insulated Rainscreen Cladding Systems, Therefore
- 9 Acceptable For Use In Buildings Above 18m In Height.
- 10 "I would like to come into the office when everyone 11 is around to present formally the new product.
- 12 "In the meantime if you would like me to run any
- 13 U-Value calculations please let me know.
- 14 "Kind regards,
- 15 "Jonathan."
- 16 Do you see that there?
- 17 A. Yes.
- 18 Q. Were you aware before this time that the RS5000 product
- 19 was going to be launched? Did you have any awareness of
- 20 that?
- 21 A. No.
- 22 Q. Did Jonathan Roome come in and formally present the new
- 23 product to Harley?
- 24 A. I can remember that he used to come into the office
- 25 quite a bit. I can remember that he used to come in and

75

- 1 check that Grenfell was still using the Celotex product,
- 2 but I can't remember him specifically doing
- 3 a presentation.
- 4 So you can't remember when any such presentation might
- 5 have happened?
- 6 A. No. I mean, I was working a lot at Trinity Square and
- 7 wasn't always in the office. I was based in London
- 8
- 9 Q. Do you have a recollection of actually being present
- 10 when Mr Roome came in to present the new product?
- 11 I don't remember any presentation, no.
- 12 We can see at paragraph 23 of your witness statement, if
- 13 we pull this up -- this is at  $\{HAR00010149/6\}$  -- you 14 sav:
- 15 "In relation to the use of Celotex I do remember
- 16 a representative of Celotex visiting Harley's offices
- 17 a number of times to discuss the Celotex product.
- 18 I cannot remember exactly what he said but I do remember
- 19 that part of the Celotex sales pitch was that Celotex 20 could be used on buildings over 18 metres tall . I also
- 21 remember the bright pink Celotex brochures which were
- 22 handed out."
- 23 Do you see that there?
- 24 A.
- 25 Q. Now, can you remember which Celotex representative it

- 1 was who visited the Harley offices a number of times?
- 2 A. It was Jonathan Roome.
- 3 Q. Yes. And approximately how many times do you think he
- 4 might have come in to discuss the Celotex product with
- 5 Harley?
- 6 A. He used to come in every couple of weeks so, you know,
- 7 over a year it would be, you know, maybe sort of 30
- 8 times or something.
- 9 Q. Okay. So quite frequently he was there?
- 10 A. Yes, I mean, he did -- before -- as I said before,
- before working for Celotex he worked for a different
- company that was more aligned with what I did as
- $13\,$  a structural engineer, and I can't actually remember the
- point at which he changed companies, but we used to see
- 15 him quite a bit.
- 16 Q. So approximately how long had you known him for as at
- 2014? Can you remember? You say you knew him at
- a different company? Was that Hilti that he was at
- 19 before?
- 20 A. Yes. it was.
- 21 Q. Was that the company you knew him at?
- 22 A. Yes.
- 23 Q. Can you remember how long before you'd known him for?
- 24 A. A number of years, because in my role, you know,
- 25 carrying out the structural design, I had to specify the

- $1 \hspace{1cm} \text{structural fixings} \text{ , and more often than not specified} \\$
- 2 Hilti .
- 3 Q. And had you had a close professional working
- 4 relationship with him on previous projects?
- 5 A. Yes.
- 6 Q. You knew him well?
- 7 A. Yes.
- 8 Q. Were you aware when you were working on the Grenfell
- $9\,$  project that Celotex FR5000 and RS5000 were marketed as
- different products, but were in fact comprised of the
- 11 same materials?
- $12\,$  A. I don't think until -- I don't think I was overly aware
- $13 \hspace{1cm} \text{that $--$ I wouldn't be able to look back and say that it} \\$
- 14 was called RS5000, so I had no knowledge that there was
- 15 two different ones.
- 16 Q. Does it follow that you never asked anyone at Celotex if
- there were differences between the FR and the RS5000
- 18 products?
- 19 A. Yes, I didn't know that the FR existed. I didn't know
- 20 really what the RS was.
- $21\,$   $\,$  Q.  $\,$  Going back to the meetings with Celotex about this
- $22 \hspace{1cm} \hbox{launch of this new product, which you say you were aware} \\$
- $23\,$  of and you remember bright pink brochures that were
- 24 handed out, were you aware that this was being presented
- as a product for dedicated use on rainscreen cladding

- 1 projects?
- A. No, I was just -- I can just remember that it was
   something that they said could be used over 18 metres.
- 4 Q. You talk about it as a sales pitch that could be used on
- 5 buildings over 18 metres. Did Celotex ever qualify that
- 6 sales pitch in any way when discussing the project with
- 7 you?
- 8 A. Not that I can remember, no.
- 9 Q. Sorry, when discussing the product with you.
- 10 A. No.
- 11 Q. Do you remember Celotex ever saying that FR5000 was not
- safe to use on buildings over 18 metres in height?
- 13 A. No.
- 14 Q. What steps did you take to test and verify the sales
- pitch for the RS5000 to check that it could be used on
- 16 buildings above 18 metres?
- 17 A. I can't remember using it on any of the projects that
- I was the designer on, so I didn't take any steps.
- 19 Q. So you're not aware that any steps were taken on the
- Grenfell project to verify the sales pitch for the
- 21 RS5000 as suitable for above 18 metres?
- 22 A. No.
- 23 Q. Would you have expected Kevin Lamb to have checked the
- sales pitch that it could be used on buildings above
- 25 18 metres?

79

- 1 A. I would expect that he would have told the architect
- 2 what product was going on there so that they could get
- 3 that checked, and that Rydon would have been told what
- 4 product was going on there so they could check with
- 5 Building Control.
- 6 Q. As far as you were concerned, did you just take
- 7 Celotex's word for it that Celotex RS5000 could be used
- 8 on buildings above 18 metres?
- 9 A. At the time I wasn't using it on any of the projects
- $10 \hspace{1.5cm} I \hspace{.1cm} was \hspace{.1cm} working \hspace{.1cm} on, \hspace{.1cm} so \hspace{.1cm} I \hspace{.1cm} didn't \hspace{.1cm} question \hspace{.1cm} it \hspace{.1cm} .$
- 11 Q. But you're the design manager for the Grenfell project.
- Why would it not have occurred to you to have made sure
- $13 \hspace{1cm} \hbox{that someone checked that that product was suitable } \hspace{0.1cm} \hbox{for} \\$
- 14 above 18 metres?
- 15 A. Because I was responsible for making sure that Kevin was
- keeping to programme. I wasn't educated in how to check
- 17 fire compliance.
- 18 Q. We'll see later that you do actually send an email in
- 19 September 2014 about the insulation, attaching the
- 20 datasheet for it and making comments on its fire
- 21 performance. So if your role was solely about programme
- and structural matters, why would you have been doing
- 23 that in September 2014?
- 24 A. I can't remember, but I don't think it would have been
- in relation to Grenfell.

1	Q.	Okay, well, we'll come and look at that in due course.	1		bit of the string ccing Jonathan Roome and saying:
2		When Celotex came in to Harley, do you remember ever	2		"Good morning Tim,
3		showing their representatives drawings of	3		"Can you please confirm the height of the building
4		Grenfell Tower?	4		that the insulation will be used in."
5	A.	Not as far as I remember, no.	5		Do you see that there?
6	Q.	Do you think anyone else at Harley showed Celotex	6	A.	Yes.
7	ζ.	drawings of Grenfell Tower?	7	Q.	
8	A.	They may have done. I mean, to have got a price to have	8	٧.	there's an email, details about the height of the
9	11.	put in the budget, I would have thought that the	9		building are provided. You see at the bottom of that
10		estimating team would have discussed quantities and the	10		Tim Bennett goes back and says:
11			11		"The building is 20 storeys and +60m in total
12	0	building in that way.	12		
	Ų.	Well, at the time when the budget was prepared, this			height."
13		RS5000 product wasn't launched, so	13		Then what we see immediately above that is
14	A.	ı , ,	14		Jeremy Suttle coming back and saying:
15		had something to price against.	15		"Thank you for conformation(sic). Unfortunately in
16	Q.	I see.	16		this case we would not be able to provide a solution as
17		Can you recall any discussions that Harley had with	17		Celotex is only tested up to 18 meters(sic) in height."
18		Celotex about the specific cladding system that was	18		Do you see that there?
19		proposed to be used at Grenfell?	19	A.	Yes.
20	A.	I don't no, I don't recall.	20	Q.	So this is before the launch of RS5000 in August 2014,
21	Q.	Now, can we turn to an email chain from May 2014, so	21		a query from Harley about whether or not Celotex have
22		earlier in 2014. If we look at this, {CEL00003119/3} at	22		a suitable insulation product in replacement of the K15,
23		the bottom, an email dated 14 May from a colleague of	23		and Celotex are coming back and saying no because it's
24		yours, Tim Bennett. This is to Kingspan's general email	24		not tested up to 18 metres in height. Do you see that
25		address in March 2014 at 13.20. It's about the water	25		there?
		81			83
1		resistance of the K15 product.	1	A.	Yes.
2		Then if we go to the next email up in this little	2	Q.	Now, did Mr Bennett at Harley make you aware of this
3		chain and look at that, we can see Tim Bennett from	3		email string and the fact that Celotex insulation was
4		Harley then emails, on 14 May 2014, Jonathan Roome,	4		not suitable for use above 18 metres?
5		ccing you in relation to Waylands House. Do you see	5	Α.	No.
6		that there?	6		Were you aware of that from any other information or
7	A.	Yes.	7	٧.	sources at the time?
8		He says:	8	Δ	No.
9	Q.	"Morning Jon,	9		So you weren't aware as at May 2014 that Celotex did not
10		"Please see the below email. On our Waylands House	10	Q.	have a product suitable for over 18 metres?
11		project we have a K15 specified insulation to be	11	٨	No, I wasn't aware.
12		• •	12		Now, if we then pick up the story again back in August
13		installed behind the ACM rainscreen. As per my email	13	Ų.	
		below I have asked whether the K15 is suitable to			and look at an email at {CEL00011960}. This is an email
14		an area which may be sat in water. Kingspan have	14		from Jonathan Roome to you on 27 August 2014, so this is
15		confirmed that the K15 is not suitable.	15		after Kevin Lamb's appointment, which was around
16		"Do you have an alternative product we can put	16		12 August 2014, and he says:
17		forward?"	17		"Hi Dan,
18		Do you see that there?	18		"Good to speak to you again (as always).
19	A.		19		"For now here is all of the info that I have on the
20	Q.	So that's copied to you in May 2014, you're asking	20		RS5000 Rainscreen product for use over 18m.
21		Jonathan Roome about an alternative product.	21		"When you have a moment please can you send me
22		Then if we go to the top of page 2 {CEL00003119/2},	22		across some drawings and an idea of who you would look
23		an email of 14 May at 10.38, we see there	23		to use for the supply chain.
24		Mr Jeremy Suttle, the technical services officer at	24		"Speak again in a couple of weeks.
25		Celotex, to Tim Bennett you're not copied into this	25		"P.S has the Waylands House ship sailed?
		82			84

1 "Kind regards, 2 "Jonathan." 3 I should have noted in the subject at the top that 4 the subject is "Grenfell Tower, [and also] Hammersmith -5 RS5000 Data". Do you see that there? 6 A. Yes. 7 Q. We also see that a "Rainscreen" zip file is attached by 8 Mr Roome to you at that point. Do you see that there? 9 10 Q. Now, we can see that this obviously followed 11 a conversation between you and Mr Roome. He says: 12 "Good to speak to you again (as always)." 13 13 Can you remember what the purpose of that call was 14 or anything about it? 15 A. I think generally he was always calling to make sure 16 that they were still in specifications and that the 17 specifications hadn't been changed by the architect. 18 That's the general sort of way that the conversations 19 went and whether we -- what projects we had coming up. 20 Q. If he was ringing to discuss the specifications on the 21 Grenfell Tower project, can you remember what you said 22 22 to him about that? 23 A. I probably would have said that it's still down as the 24 Celotex product, I imagine, but --25 Q. I thought you said you --85

1 A. -- I can't remember.

2 Q. Sorry, finish your answer.

3 A. I can't remember. I'm assuming, to be honest.

- 4 Q. I thought you said earlier that you weren't aware that
- 5 it was the Celotex FR5000 product that had been
- 6 specified?
- 7 A. Yeah, if you'd asked me before any of this happened,
- 8 I wouldn't have been able to look back and remember what
- 9 the product was.
- 10 Q. But looking at this now, do you think it's likely that 11 you discussed with Mr Roome what the specification for
- 12 the insulation at Grenfell Tower was?
- 13 A. Yes, looking at this.
- 14 Q. Yes.

15 Now, we have the attachments in the zip file and it 16 included a pack of documents relevant to the RS5000 17 product. I'm going to take you through a number of 18 those documents. It included a Celotex product 19 comparison sheet, an LABC certificate for the product, 20 a BRE global test report, a rainscreen cladding 21 compliance guide and a rainscreen cladding specification 22 guide. So a pack of documents is being sent to you by 23 Mr Roome in that zip file.

24 Can you recall reading any of those documents at

25 this time? A. I've looked at these from the other evidence and I can't

2 remember having ever seen them at the time. I think, to

3 be honest, those kinds of things I wasn't educated in,

4 and so I tended to pass them on -- you know, on other 5 projects, I would always pass them on to people who were

6 educated in that way.

7 O. You said in your witness statement, and we looked at it

8 earlier, that you remember the pink brochures.

9 Α.

10 Q. You remember the cover of the pink brochures. Does that

11 mean you think you read those pink brochures?

12 Again, not in detail. The most I knew about at that

point was probably U-values. I understood what U-values 14 were and what U-values needed to be achieved. But for

15 anything else I would have passed it on.

16 Were you aware that this was quite a significant

17 development in terms of cladding insulation, the

18 development of a Celotex product that could be used on

19 buildings above 18 metres? Do you remember being struck

20 that that was an important development at the time?

21 I can remember at the time that Jonathan used to say

that it was a very important development, but from my

23 understanding of the industry, I didn't know it was

24 an important development, but I took his word on it.

25 So you didn't know it was an important development. You

87

1 didn't know that, prior to that, K15 had been the only

2 insulation product that had been regularly used on

3 buildings above 18 metres that was of a phenolic or, you

4 know, similar nature? Did you not know that, that K15

5 had often been specified in that way prior to this?

6 All I can remember from the time is Jonathan saying that

7 this was the first product to be specified for use for

8 over 18 metres, so I thought that it was the only one.

9 I didn't know that K15 could be.

10 Q. I see. You hadn't really thought about K15 before this?

11 A. No.

12 No. okav.

13 Did you pass these documents on to anyone else 14 within Harley after they were sent to you?

15 A. I don't have any memory of it, I'm afraid.

16 Q. Or to Studio E or Rydon?

17 A. If I'd been the designer on a project, that would have

18 been my normal course of action, but I can't remember

doing it on this one. 19

20 Q. I see.

21 Let's turn to the LABC registered details

22 certificate to start with. This is at {CEL00000009}.

23 Were you aware at this time of who the LABC were,

24 Local Authority Building Control? Were you aware of

25 that organisation?

storeys above 18m in height ..."

2 2 Q. So that didn't mean anything to you? Do you see that there? 3 3 A. Yes. 4 4 We can see at the top that it says, second line down in Q. Did you note that at the time, that it had been 5 5 successfully tested to that test standard? 6 6 "RS5000 PIR insulation board." A. All I can remember is what was -- what I was being told 7 7 Do you see that there? "PIR", do you see the by their sales rep and what was on their -- the outside 8 8 reference to "PIR" at the top? of the pink brochure, that it was used -- you know, 9 A. Yes. 9 acceptable for use in buildings above 18 metres. 10 Q. Were you aware what PIR meant? 10 Q. Is that all you recall being told by their sales rep? 11 11 A. And that it was the first one that was, you know, the A. No. 12 So you didn't know it meant polyisocyanurate? 12 first of that kind of high-performance insulation that 13 13 could be used in buildings over 18 metres. A. No. 14 Q. Did you give any thought to what type of insulation this 14 Q. Yes. 15 15 was when this pack of material came through? It ends there by talking about alternative 16 16 A. I think that I just thought that it was a more highly compliance to ADB, do you see that there --17 performing insulation and, yes, I think that was about 17 A. 18 18 Q. -- in that paragraph we were just reading? Did that it. 19 19 Q. Okay. mean anything to you at the time? 20 20 Under "Limitations of use", further down, you see A. Alternative compliance wouldn't have meant anything to 21 21 that title on the left -hand side, four boxes down, it me at the time, but, looking back on it, I imagine that 22 22 was, you know, the desktop studies that people would says 23 23 "For use in rainscreen wall construction including sometimes mention, and you would send it off to the 24 above 18 metres height. The required thickness of board 24 design team to be checked. 25 25 for a particular construction must be established with Q. Okay. It then says: 1 1 the use of the Celotex online calculator." "The product has been tested an(sic) achieves 2 2 Do you remember noting that? a 'Class O' spread of flame." 3 3 A. No. Do you see that there? 4 4 0. That first line there, it says: A. Yes 5 "For use in rainscreen wall construction including 5 Do you remember noticing that at the time? 6 6 above 18 metres height." A. I can't remember. 7 7 Did you notice that at the time, that they were Q. Can you help us as to what you considered the relevance 8 8 saying it could be used in buildings above 18 metres? to be of the fact that the insulation had achieved 9 9 A. Yes. But not on this document. class 0? 10 Q. Did you consider that this meant that the product could 10 A. At the time, to me, class 0 meant that it couldn't catch 11 11 be used on any building over 18 metres, regardless of fire. 12 the other components in the external wall? 12 So did you read the information about class 0 in this 13 13 pack of information and conclude something from that? A. Yes. 14 Q. Now, can I ask you to read the paragraph below. Under 14 A. I can't remember. I don't think so. 15 15 "Advice Notes", it says: Q. Again, we'll look at it in due course, but 16 "Celotex RS5000 can be used with a variety of 16 in September 2014 you send an email saying that the 17 cladding systems (including masonry or rainscreen 17 insulation is class 0, so can you remember knowing at

90 92

18

19

20

21

22

23

24

25

Q. Okay.

the time that piece of information?

tell me that, yes.

A. If I sent an email, I must have looked at something to

Do you think that the insulation being class 0

A. Looking back on that period of time, I think that the

classifications were misleading. I don't think that

affected the decision to use it on the Grenfell project?

systems) and can be fixed back to a structural steel

"Celotex RS5000 has successfully tested to

therefore is acceptable for use in buildings with

Q. Then if we keep going in that section, it says:

Do you see that there?

frame with a sheathing board or direct back to masonry."

BS 8414:2 2005, meets the criteria set out in BR 135 and

18

19

20

21

22

23

24

25

A. Yes.

A. No.

1 anybody fully understood what class 0 meant, you know, 1 a classification for it, just to be accurate. 2 2 from the very highest, most qualified architects through 3 3 to people like me, you know, doing detailed design and specification guide at the time? 4 4 structural engineering. 5 Q. Let me put the question in a different way: were you 5 6 6 aware within Harley that the fact that the insulation it . 7 7 was class 0 made a difference to it being selected for Q. Okay. 8 8 use on the Grenfell project? 9 9 A. No, because -- well, as far as I was aware, it was that column, it says: 10 10 prescriptive specification, so Harley wouldn't have 11 looked at it as class 0 and chosen it; they would have 11 BS 8414 ..." 12 seen that it had been chosen and probably looked to see 12 13 13 if they believed it met the requirements or not. 14 14 15 15 18 metres in height." Let's look at another of the documents sent to you 16 16 by Mr Roome on 27 August, the Celotex rainscreen Do you see that there? 17 cladding specification guide. This is {CEL00000013}. 17 A. Yes. 18 So here we've got the pink cover to this 18 19 19 specification guide, which you say in your witness 20 statement you do remember seeing; is that right? 20 being told it and having it pointed out to me, but I had 21 21 no knowledge of what BS 8414 was or BR 135, and if I'd A. I remember the pink of it. I couldn't say it was 22 definitely this one. 22 23 23 Q. Do you think you read this document at the time you were off to others to check. 24 sent it by Mr Roome? 24 25 25 A. I don't think I would have. I think I would have 93 95 1 probably -- he probably would have shown it to me and 1 Grenfell Tower? 2 2 pointed out what he believed the key aspects were, but 3 3 it wasn't my area of expertise. educated on that. 4 4 Q. Whose job was it on the Grenfell project to read this 5 Celotex specification guide for the RS5000 insulation? 5 6 6 A. Within Harley, I don't know. the bottom of that page, it says: 7 7 Q. You don't know? 8 8 A. No. follows ..." 9 9 Q. So you didn't think that Kevin Lamb read this? Do you see that there? 10 A. If Kevin had satisfied himself that the product had been 10 A. Yes. 11 11 checked by the architect and Building Control, I don't Q. 12 believe he would need to read it. 12 was, and it begins with, "12mm fibre cement panels".

13 Q. Okay.

14

15

16

Now, if we go on within this document at page 5 {CEL00000013/5}, we can see, if we look at the top of the page, we've got a section for "Fire Performance". It says there:

17 18

"Fire Performance.

19 "Rainscreen Insulation.

20 "Celotex RS5000 is Class 0 fire rated as described

21 by the national Building Regulations ..."

22 And it talks about two tests that it's passed there.

94

23 Do you see that there?

24

25 Q. Or one it's passed and the other one it's got

So did you notice the reference to class 0 in this

A. As you said by the email that you've mentioned, I must have noticed it at some point, but I have no memory of

And then for "Building above 18 metres" further down

"Celotex RS5000 has been successfully tested to

Then it explains what that test method is.

"... meets the criteria set out in BR 135 and is therefore acceptable for use in buildings above

Q. Again, can you recall reading that in this guide?

No, I can't recall reading it in the guide. I recall

been shown this on another project, I would have sent it

Q. So does it follow that you didn't form a view about

whether this meant that the RS5000 could be used on

A. No, I wouldn't have formed a view on it because I wasn't

Q. Now, this guide set out the nature of the system that 

"The system tested to BS 8414-2: 2005 was as

And we can see that they've told you what the system

13 Do you remember noticing, in either this 14 specification guide or indeed any of the other

15 literature about RS5000, that it had been tested on

16 a specific cladding system? Do you remember noticing

17 that?

18 A. No.

19 You weren't aware of that at the time?

20 Α.

21 So you weren't aware that it had been tested with fibre

22 cement panels as the rainscreen panel in those tests?

23 A.

24 So you didn't notice that that was different to the

96

25 rainscreen system at Grenfell, which had aluminium

- 1 composite material panels? You didn't notice that?
- 2 A. No.
- 3 Q. Now, you talked just a moment ago about what you'd been
- told by the Celotex representative. Did the Celotex 4
- 5 representative ever tell you anything about the specific
- 6 system that had been tested? Did he go into those
- 7 details?
- 8 A. No.
- 9 Q. And then if we look at the column on the right, if we
- 10 can go back up to the top of the page, in the third
- 11 paragraph down on the right we get this, it says:
- 12 "The fire performance and classification report for 13 Celotex RS5000 only relates to the components detailed
- 14 above. Any changes to the components listed will need
- 15 to be considered by the building designer."
- 16 Do you see that there?
- 17 A. Yes.
- 18 Q. Do you remember reading that statement or any similar
- 19 statement in any of this Celotex RS5000 literature?
- 20 A. No.
- 21 Q. Had you read that, who would you have thought needed to
- 22 consider it? It talks about the "building designer".
- 23 The building designer to me would be the architect.
- 24 Q. Let's turn to another of the documents. This is the
- 25 rainscreen cladding compliance guide, and this is
- 1 {CEL00000012}, and it was another document you were
- 2 provided with by Mr Roome on 27 August 2014. Again,
- 3 this has got the pink cover.
- 4 Do your answers kind of follow over, that you don't
- 5 recall reading this in any detail at the time?
- 6 A. No, because it wasn't what I was trained in.
- 7 Q. If we can go to page 3  $\{CEL00000012/3\}$ , in the far
- 8 right-hand column, we get more information about the 9 performance criteria here. There's a discussion about
- 10 BR 135 and, again, we get the statement in that final 11
- paragraph:
- 12 "The classification applies only to the system as
- 13 tested and detailed in the classification report ...
- 14 [It] can only cover the details of the system as tested. 15
- It cannot state what is not covered. When specifying or 16 checking a system it is important to check that the
- 17 classification documents cover the end-use application."
- 18 Do you see that there?
- 19 A. Yes
- 20 Q. Again, is it your evidence that you don't recall ever
- 21 being aware of that caveat in this pack of information?
- 22 A. No, I don't recall that, no.
- 23 Q. If you go to page 4 {CEL00000012/4} in the middle of the
- 24 page, we can see at the top of the page that the system
- 25 tested is again listed, but this time we've also got

- 1 a diagram of the system below that. If we can pull up
- 2 that diagram -- exactly. So there we can see the system
- 3 that was tested, and you can see on the second label
- 4 down, "12mm Marley Eternit Natura panel". Do you see
- 5
- 6 A.
- 7 O. Would that have been something you were familiar with at
- 8 the time, a Marley Eternit Natura panel?
- 9 It's not a product that I'd used before.
- 10 So it wasn't a product that you'd used on a rainscreen
- 11 system before?
- 12 A. No.
- 13 Q. Is it your evidence that you didn't notice at the time
- 14 that the system that was tested was with that product
- 15 that you didn't recognise?
- 16 A. No, I didn't notice that.
- 17 Q. Then if we go back up the page again -- sorry, we've
- 18 already seen the warning, sorry.
- 19 Did you ever discuss anything about the Marley
- 20 Eternit Natura panel with Mr Roome?
- 21 I don't believe so, no.
- 22 You don't remember him mentioning that that was the
- 23 panel that had been used in the test?
- 24 A. No.
- 25 Did you ever have any doubts in your mind about whether

- 1 the system ought to be used at Grenfell, or was that
- 2 simply something that you just didn't apply your mind
- 3
- 4 A. Yeah, because it was relating to fire performance and
- 5 thermal performance that I wasn't trained in, you know,
- 6 I applied my mind to the structural performance on
- 7 Grenfell.
- 8 Q. Can we also turn now to the BRE global test report that
- 9 Mr Roome sent over. This is {CEL00000011}. It's dated
- 10 11 August 2014. Can you see that? That's the cover for
- 11 this test report, and it's a classification report in
- 12 accordance with BR 135.
- 13 Do you remember ever reading this document at the
- 14 time?
- 15 A.
- 16 If we go to page 2 {CEL00000011/2} at item 2.1, it sets
- 17 out the full details of the system that's tested there.
- 18 Do you see that there?
- 19
- 20 Q. Again, does that bring back any memory of looking at
- 21 that?
- 22 A.
- 23 If we go to page 4 {CEL00000011/4}, paragraph 5.3, under
- 24 the heading "Field of application", do you see it says
- 25 there:

1 "This classification is valid only for the system as 2 installed and detailed in Section 2 of this 3 classification report and the associated details found 4 in the related test reports ..."

5 Do you see that there?

6 A. Yes.

 $7\,$  Q. Again, is it your evidence that you didn't notice that

8 at the time?

- 9 A. No.
- 10 Q. You didn't read that?
- 11 A. No.
- $12\,$   $\,$  Q.  $\,$  Did you at any time query with Celotex or anyone else
- $13 \qquad \quad \text{whether there was a desktop study to support the use of} \\$
- RS5000 for the system at Grenfell?
- 15 A. On Grenfell, no. I know that I sent other desktop
- studies off for other jobs, but I can't remember what
- products they were for.
- 18 Q. Did you ever check on Grenfell whether anyone else was
- asking for a desktop study or other assessment to
- 20 support the system at Grenfell?
- 21 A. No.
- 22 Q. Whose responsibility did you think that was?
- 23 A. If the product had been specified by the architect,
- which I believed it had been, then I believe it would
- 25 have been their responsibility to ensure that a desktop

101

- 1 study had been carried out.
- Q. But, Mr Anketell-Jones, we've seen that the product that
- 3 was specified was the FR5000 product, and we've seen
- 4 Celotex saying in May 2014 that that product wasn't
- 5 suitable for use above 18 metres. Is it your evidence
  - that you simply weren't aware that this was a different
- 7 product?

6

- 8 A. Yes. I wasn't aware of -- that there was a difference
- 9 in the products, and looking back on it, I thought we
- were just following the specification, in which case
- I would have thought that it had been checked fully by
- 12 the architect.
- Q. But how could you have thought that when you said you
- knew this was a new product that was being launched, the
- first product to be used above 18 metres?
- 16 A. I had no concept that it hadn't already been checked
- through with desktop studies at that point. I didn't
- realise that the timelines worked that way. I thought
- 19 that it had already been signed off.
- 20 O. Okay.
- 21 Can I ask you to turn to Mr Ray Bailey's witness
- 22 statement. This is  $\{HAR00010184/42\}$  and look at
- paragraph 170. Do you see that there? He's asked the
- 24 question:
- 25 "Did Harley rely on any advice from third parties

102

1 about the compliance of the design ..."

2 And he says:

3 "As described previously, we relied upon/took into

 $4 \qquad \quad \text{consideration advice from Studio E in respect of the} \\$ 

5 position of cavity barriers, Siderise in respect of the 6 confirmation of the specification of the cavity

barriers, and from manufacturers in relation to the

8 suitability of the Reynobond ACM and Celotex RS5000."

9 Do you see that there?

10 A. Yes.

 $11 \quad Q. \quad \text{Did you ever take any specific advice from Celotex about} \\$ 

the use of RS5000 on the Grenfell building?

13 A. No, not that I remember.

14 Q. Now, if we look at paragraph 42 of your witness

statement -- this is  $\{HAR00010149/10\}$  -- you say there:

This type of phenolic insulation was used very

frequently at the time. The main ones were Kingspan and

Celotex. At the time Celotex described it as Class 0

and claimed that it was suitable for use on buildings

20 over 18 metres and were pushing it heavily (as I have

 $21 \hspace{1cm} \text{described in answer to question 4b)}. \hspace{0.2cm} \text{But they were not} \\$ 

 $22 \hspace{1cm} \text{drawing people's attention to the exact configuration} \\$ 

 $23\,$  that allowed it to be used on buildings over 18 metres."

24 Do you see that there?

25 A. Yes.

103

- $1\,$   $\,$  Q. Now, can you explain why you're saying there that they
- were not drawing people's attention to the exact
- 3 configuration given the documents that we've just looked
- 4 at?
- 5 A. Because when I look back on it now, having read those
- 6 documents, I have no recollection of them drawing our
- 7 attention to that.
- 8 Q. Are you saying that you personally didn't have the exact
- 9 configuration drawn to your attention? Is that why
- 10 you're saying that?
- 11 A. Yes.
- 12 Q. Are you saying that you personally were confused by the
- Celotex marketing literature as to what compliance
- standards the product had actually achieved?
- 15 A. I think at the time I didn't have enough knowledge on it
- to even probably be confused. I would take what they
- were saying and then I would pass it on to people who
- 18 understood it.
- 19 Q. Yes. If you didn't actually read any of the documents
- 20 I just took you to -- and I think that was your
- evidence -- how could you have become confused?
- 22 A. That's my point. I don't think I understood enough
- about it to even be confused. I think with other things

that you're educated on, you can become confused about

25 it and not understand what people are getting at. But

104

- 1 on something where you literally have no training, you
- 2 literally just take what you're given. You may not
- 3 necessarily believe it or, you know, approve it
- 4 yourself, but you take what you're given, you say,
- 5 "Okay, I hear what you're saying", and you pass it on to 6
  - the people who do understand that for them to approve.

A. If I had been the designer, I would have been passing it

- 7 Q. And on Grenfell, who were you passing it on to, the
- 8 people who do understand it, for them to approve?
- 10 on to the architect and Building Control.
- 11 Q. So does that mean you expected Kevin Lamb to be passing
- 12 on this kind of information to the architect and
- 13 **Building Control?**
- A. I would expect Kevin to have satisfied himself that 14
- 15 if -- that it had been signed off by the architect and
- 16 Building Control.
- 17 Q. Right.

9

- 18 Can we look at another document now from August. So 19
- the day after you were sent this pack of documents from
- 20 Celotex -- that was on 27 August 2014 -- it appears that
- 21 you had a discussion with them about appropriate
- 22 U-values. Can we go to {CEL00001451}, and this is
- 23 an extract again from the Celotex Salesforce entry, and
- 24 we'll need the offline version, sorry.
- 25 I want to look at the entry -- that first one on

105

- 1 that page there that we can see, it's dated
- 2 28 August 2014, and it's about Grenfell Tower. Can you
  - see it says "Related To"?
- 4 A. Yes.

3

- 5 Do you see that? It's assigned to someone called 6
  - Mark Willoughby, I think within Celotex, and then:
- 7 "Comments: Refurb of Grenfell Tower.
- 8 "0.15 U Value. Dan has calculated using FR but
- 9 stated that he needs to use RS5000. 150mm.
- 10 "Due on site in October.
- 11 "Will re-calculate using our software instead of
- 12 [Bulldesk] to make sure everything is in order."
- 13 Do you see that there?
- 14 A. Yes, it's Builddesk.
- 15 O. Thank you.
- 16 So focusing in on that, do you remember who you
- 17 might have had a discussion with at Celotex at this
- 18 time?
- 19 A. I don't recall it. I recall that we used to have
- 20 a piece of software in the office called Builddesk and
- 21 you could put in the products that you were using to
- 22 calculate a U-value. I would have thought maybe
- 23 I called Celotex to get them to check it or something.

106

- 24 Q. But you can't recall who you spoke to at Celotex?
- 25 A. No.

- Q. Can you help us with the comment:
- 2 "Dan has calculated using FR but stated that he
- 3 needs to use RS5000."
- 4 Do you see that there?
- 5 A. Yes.
- 6 Q. What's your understanding of what "FR" means there?
- 7 A. My understanding now is that it was a different brand
- 8 name for the same product.
- 9 Q. So could it mean Dan has calculated using FR5000, but
- 10 stated that he needs to use RS5000? Do you see that
- 11 there?
- 12 A. Yes, the software came with a set number of products in
- 13 it, so it may not have had the RS5000 in it.
- 14 O. Yes.
- 15 A. It just works off a figure so each product has a U-value
- 16 performance or a thermal resistance, and so you just
- 17 select one that has a similar thermal resistance to the
- 18 one you want to roughly calculate the thickness.
- 19 Q. Looking at this now, does that mean that, as at this
- 20 point, August 2014, you must have been aware that it was
- 21 FR5000 that had been specified as the product originally
- 22 by the architects?
- 23 I don't know. Either the product wasn't available in
- 24 the software or I just had a quick look at the
- 25 NBS specification and put in what was stated there.

107

- 1 Q. Can you help us: is it at this point that it was decided
- 2 that the specification should change from FR to RS5000?
- 3 You're recorded as stating there, "stated that he needs
- 4 to use RS5000". Was that a decision that you had taken?
- 5 A. No, I have no recollection of changing it or that it was
- 6 even different.
- 7 Q. So do you think this is inaccurate, or can you explain
- 8 why it says, "stated that he needs to use RS5000"?
- 9 A. I can't remember. I'd be guessing.
- 10 Q. Do you know who made the decision to use the RS5000
- 11 product on the Grenfell project?
- 12 No. I can't.
- 13 Q. Can you help us as to in what circumstances the RS5000
- 14 came to be used on the Grenfell project?
- 15 A. Only by guessing.
- 16 Q. We don't want you to guess.
- 17 Did you ever check with Rydon or Studio E that they
- were happy with the RS5000 product? 18
- 19 A.
- 20 O. Whose job within Harley would it have been to have
- 21 checked with Rydon and Studio E that they were happy
- 22 with the RS5000 product?
- 23 Project manager or project designer.
- 24 So who was that in Harley, then?
- 25 It would have been Ben or Kevin.

Q. Ben or Kevin. 2 2 Do you remember having a discussion with Kevin Lamb Q. Sorry? 3 in which you talked about the RS5000 Celotex product, 3 4 4 the new Celotex product, with Kevin Lamb? O. Yes. 5 A. 5 Yes. 6 6 Q. So how would Kevin have been aware of that product? 7 7 A. I don't know. 8 8 Q. Now, if we can look forward in the chronology now, if we 9 can go to another document, {CEL00000014}, and if we 9 10 10 look at the bottom of page 1, at the very bottom of that 11 page, we can see on 18 September 2014 -- so this is 11 160mm." 12 later in time, so three weeks or so later -- he says: 12 13 13 "Morning Dan, A. Yes. 14 14 "Please can you let me know your availability to 15 15 discuss Grenfell Tower and the other projects in your 16 16 pipeline. 17 "Kind regards, 17 18 "Jonathan." 18 A. Yes. 19 19 Do you see that there? 20 20 A. Yes. 21 Q. We can see from the top email on page 1 that he followed 21 22 22 up with a further request on 17 November 2014: that? 23 23 A. 24 "Would you be around on Thursday/Friday to catch-up 24 Q. Given what you've said about the limitations of your 25 25 regarding your current/future projects? 109 1 1 "Kind regards, 2 2 "Ionathan." 3 3 Do you see that there? 4 4 A. Yes. 5 Do you think it's likely that you spoke to Mr Roome in 5 6 6 between those two emails, between September predicted. 7 7 and November? I think you said earlier that he was 8 8 coming in on a kind of fortnightly basis. Is it likely 9 9 that you had discussions with him prior to November? 10 A. It's likely, but I can't remember. 10 11 11 Q. Okay. 12 We can see from the emails that a meeting did take 12 13 13 place on 24 November 2014, because that evening Mr Roome 14 14

sent you an email. If we look at that, this is at {CEL00000018}. If we could just blow up the top half of that email, thank you. This is from Jonathan Roome to you, and just note there, no one else is copied into that email, so there's no Mark Stapley, no one else at Harley, just you, "Celotex Project Review", and he says: "Hi Dan, "I spoke with Mark and the team regarding a few Would that be Mark Stapley that he'd spoken to? A. I don't know, to be honest. Q. And then --110

A. It could have been either of them.

It could have been either of them.

So Mark Harris or Mark Stapley?

Q. And then we've got:

"Grenfell Tower

"When we last looked at this we came to a conclusion of using 3,000m2 of 150mm RS5000. Is this still so? "Mark's drawings were showing a mix of 100mm &

Do you see that there?

So this email, would you agree, suggests that you have previously looked at the quantity and thickness of

RS5000 that you would need to use for the Grenfell

project?

Do you agree?

You've sat down with Mr Roome and you've talked about

role, can you explain why you were having those

111

discussions with Mr Roome?

A. I think because of our relationship from previous -- his previous role, that it was just a useful way for him to

be able to find out what work was coming up and what he

could sort of start putting into his sales figures for

Q. Because this is about the insulation, isn't it? So it

can't have had anything to do with the structural

performance, can it?

A. No, but based on our previous relationship, we had

a relationship where he could come in and talk to me,

and it was a way of him being able to predict what was

coming up in his sales forecasts.

Does that mean, on the Grenfell project, because of the

15 relationship you had with Jonathan Roome at Celotex,

16 that you did get involved in helping select the RS5000

17 insulation for the project?

18 A. No. Just helped him in anticipating what sort of

19 projects were coming up and what sort of quantities

20 those products might have on them if their insulation

21 was to be used.

22 Q. But it's much more specific than that, isn't it? You're

23 actually looking at very specific quantities and

24 thicknesses of a specific Celotex product for the

25 Grenfell Tower project. Isn't that exactly what we see 112

15

16

17

18

19

20

21

22

23

24

- 1 here?
- 2 A. Yes, but that's the kind of information he would be
- 3 looking for to understand what sort of work was
- 4 potentially coming up.
- $5\,$  Q. So is what you're saying that you anticipated he would
- 6 have further discussions with somebody else at Harley
- 7 about whether to choose RS5000 on the Grenfell project?
- 8 A. As far as I understood, the RS5000 was always chosen.
- 9 Even looking back on it now, I come to the same
- 10 conclusion, that the difference between the two
- products -- there wasn't one, and at some point someone
- $12\,$  must have said, "You can't use that one, but the RS5000
- is the equivalent".
- $14\,$   $\,$  Q.  $\,$  I see. But that does suggest that you were aware that
- you were changing products.
- 16 A. Honestly, I was not aware that it was changing products.
- 17 Q. Okay.
- $18 \hspace{1.5cm} \hbox{Do you remember which drawings you had discussed and} \\$
- looked at with Mr Roome? He says:
- "When we last looked at this we came to a conclusion
- of using ... Is this still so?
- 22 "Mark's drawings were showing a mix of ..."
- 23 Can you recall what drawings were reviewed by
- 24 Celotex?
- 25 A. No, Mark must have shown him some when I was working in

- 1 London.
- Q. So you can't help as to whether they showed the entire
- 3 wall build-up of the system at Grenfell?
- 4 A. No.
- 5 Q. We know that the Harley drawings did not themselves
- 6 identify the Reynobond ACM product. Do you know whether
- 7 Jonathan Roome was ever shown the Harley specification,
- 8 which did show that product, or was otherwise told that
- 9 it was going to be Reynobond ACM?
- 10 A. No, I don't.
- 11 Q. Did you or anyone else at Harley ever tell
- $12 \hspace{1cm} \hbox{\it Jonathan Roome specifically that the rain screen you were} \\$
- proposing to use on Grenfell was a Reynobond ACM?
- $14\,$  A. Not that I'm aware of, no.
- $15\,$   $\,$  Q.  $\,$  Did you have discussions with Mr Roome about whether
- RS5000 should be used on Grenfell Tower?
- 17 A. As I wasn't the designer on the project, I don't believe
- 18 I would have discussed it with him in direct relation to
- $19 \hspace{1.5cm} \hbox{Grenfell} \, . \hspace{.2cm} \hbox{I would have discussed it in more a general} \,$
- sense, that it was appropriate for use over 18 metres,
- $21\,$  but for any of the projects that I was working on and he
- $22\,$  was putting it forward, I would have sent it off to that
- design team.
- $24\,$   $\,$  Q. So you don't accept that this email suggests you did
- 25 have a specific discussion about the use of RS5000 for

114

- 1 the Grenfell project?
- $2\,$   $\,$  A. It does discuss that it was going to be used on Grenfell
- 3 and he would have been aware it was going to be used on
- $4 \qquad \qquad \text{Grenfell} \, . \quad \text{Sorry, I'm not -- what was the question} \\$
- 5 specifically?
- 6 Q. So you're not accepting that this email suggests you did
- 7 have a specific discussion about the use of RS5000 for
- 8 the Grenfell project?
- $9\,$   $\,$  A. No, he would have been aware it was being used on
- 10 Grenfell.
- 11 Q. Did Mr Roome ever expressly provide you with an
- assurance that the RS5000 product was suitable for use
- in the specific system proposed for use at
- 14 Grenfell Tower?
- $15\,$  A. I never discussed the specific suitability of RS5000
- with him.
- 17 Q. Did, to your knowledge, Mr Roome ever conduct any
- assessment of the cladding system at Grenfell as a whole
  - and confirm that RS5000 was safe to use in that
- 20 application?

19

- 21 A. Not that I'm aware of.
- 22 Q. Did they provide you with any detailed analysis to
- explain why they came to the conclusion that it was
- an acceptable use of the product?
- 25 A. Not that I'm aware of.

115

- $1\,$   $\,$  Q. In Mr Bailey's evidence last week, he indicated that he
- $2 \hspace{1cm} \hbox{thought there had been an assessment by Celotex that } \hspace{1cm} \hbox{it}$
- 3 was a suitable product for use at Grenfell. Is your
- 4 evidence that you weren't aware of any such assessment?
- 5 A. If I'd been -- I wasn't aware of it for this project.
- 6 On all other projects, I would have always been checking
- 7 that it had been done by the architect and
- 8 Building Control.
- $9\,$   $\,$  Q. Were you ever involved in  $\,$  promoting RS5000 for use on
- 10 Harley projects?
- 11 A. I don't believe I ever tried to promote it on any
- 12 projects.
- 13 Q. What about specifically for Grenfell Tower? Do you
- $14 \hspace{1.5cm} \text{remember ever supporting, within Harley, the use of} \\$
- RS5000 on the Grenfell project?
- 16 A. No. It was a prescriptive performance, from my point of
- view. It was already specified.
- 18 Q. Now, in your witness statement you've said that you
- 19 attended two design team meetings in August 2014
- and October 2014. The minutes of the design team
- meeting for August 2014 do show you there. The minutes for the October 2014 meeting do not show you there, but
- you are at the September 2014 design team meeting.
- Is it possible that you've simply got confused about
- 25 that?

A. It was a long time ago. Q. Did you ever consider whether another insulation 2 2 Q. Yes. Let's look at the minutes of that September 2014 product, such as a mineral wool insulation product, 3 design team meeting. It's at {RYD00017128/4}. 3 might have been more appropriate for the Grenfell 4 4 Sorry, we probably ought to look at the front of project? 5 those meeting minutes just to check that you were there 5 A. No, because it had been specified by the architect. It 6 6  $\{RYD00017128/1\}$ . Yes, so you can see it's held on site was a prescriptive specification . We weren't trying to 7 7 on 2 September 2014 at 10.00 am, and you are there in put forward other products in my mind. 8 8 the "Present" list on the left -hand side. Do you see Q. And then just finally on this set of minutes, and then 9 that? 9 I think we can break, the post-meeting note, that PMN, 10 10 do you see at the bottom of that page? A. Yes. 11 11 Q. Together with Kevin Lamb, can you see that? A. Yes. 12 12 0. It says there: Q. If we go to page 4  $\{RYD00017128/4\}$  at item 3.62, we can 13 13 "Max Fordham tender U-value document was shared to 14 14 see U-values being discussed. Do you see that there? team via email. External wall construction was checked 15 15 A. Yes. against all tender information and all information 16 16 Q. And it says: shared." 17 "U-values were discussed with SL ..." 17 Do you see that there? 18 I think that must be Simon Lawrence; is that right? 18 A. Yes. 19 19 A. I presume so, yes. Q. Now, were you involved in that checking process for the 20 20 "... with [Simon Lawrence] asking how the figures in the external wall construction? 21 21 spec. were arrived at and whether they need to be A. Not that I remember. 22 22 rechecked from an M&E and insulation point of view. Is Q. So you don't recall checking that construction against 23 23 the insulation thickness show on Architect drawings, the tender information? 24 correct (sic)." 24 A. No. 25 25 Then we see this. It says: Q. Do you know whether anyone else at Harley did, as 117 119 1 1 "DAJ ..." recorded in the minutes? 2 That would be you, Daniel Anketell-Jones? 2. A. No. I mean, reading this, it looks more like a check 3 3 A. Yes. that was carried out on -- with the design team. 4 "... confirmed that he had checked them but with the 4 O. MS GRANGE: Okay. 5 assumption that [Rydon Maintenance Limited] were fitting 5 Mr Chairman, I think that would be a good moment. 6 6 SIR MARTIN MOORE-BICK: Good point? further insulation internally. [Simon Lawrence] didn't 7 believe this was part of the spec. All parties agreed 7 MS GRANGE: Thank you. 8 8 SIR MARTIN MOORE-BICK: Well, Mr Anketell-Jones, it's time to check their documents." 9 9 Do you see that there? we had a break for lunch. We'll stop now and we'll 10 10 start again at 2 o'clock, please. 11 11 Does this mean that you had checked the U-values for the Please don't talk to anyone about your evidence or 12 insulation? 12 anything to do with it over the break, and we'll see you 13 A. That would have been with that Builddesk software that 13 back here at 2 o'clock, please. 14 we looked at earlier. 14 All right, thank you. 15 Q. So it was part of your role, was it, to check U-values 15 (Pause) 16 and thermal performance of the insulation? 16 Good. 2 o'clock, please. 17 A. I don't think it was specifically part of my role. It 17 (1.03 pm) was just trying to double-check on this particular 18 18 (The short adjournment) 19 project to help them out. 19 20 Q. Did this checking process of the U-values prompt any 20 SIR MARTIN MOORE-BICK: Right, Mr Anketell-Jones, ready to 21 consideration of whether the product was suitable from 21 continue? 22 22 other perspectives, such as a fire safety perspective? THE WITNESS: Yes.

118 120

23

24

25

A. No, it would have been just checking whether the U-value

that they were trying to achieve could be achieved with

the thickness of insulation that they were specifying.

23

24

25

SIR MARTIN MOORE-BICK: Good, thank you very much.

Yes, Ms Grange.

MS GRANGE: Yes, thank you.

1 I'm staying with the story of the insulation and
2 your contact with Celotex.
3 Can we turn to a document {CEL00009974}. This is
4 from the Celotex Salesforce database and it shows the

from the Celotex Salesforce database, and it shows that you had what seems to be known as a contact profile within their database. Do you see that there? So it's

got your name at the top. Do you see that?

8 A. Yes.

5

6

7

- 9 Q. And details about your job and your role below that. Do you see that there?
- 11 A. Yes.
- 12 Q. Were you aware that you were seen as a contact profilefor Celotex at the time?
- 14 A. Not as a person but as a company, I would have thought.
- 15 Q. I see, yes, so Harley would, certainly in your mind,
- have been seen as a key contact for Celotex?
- 17 A. As a contact, yes.
- 18 Q. Yes.
- Did you ever have any role in the marketing or promotion of Celotex products?
- 21 A. No.
- 22 Q. Did Harley ever get involved in helping Celotex to
- 23 market its range of products?
- 24 A. No.
- 25 Q. Now, following on in the chronology, I now want to pick

121

- 1 up where we are in January 2015. If we can look at
- 2 {CEL00000019/2}, an email that you send -- there we go,
- 3 at the bottom of that page, if we zoom in on the bottom.
- 4 You send this email on 16 January 2015 and the subject
- 5 is headed "RS5000". It's to Jonathan Roome at Celotex.
- 6 Do you see that there?
- 7 A. Yes.

16

17

18

19

20

21

22

23

24

25

- $8\,$  Q. We looked at this very briefly when we first started off
- 9 your evidence, but I now want to ask you some more detail about it.
- 10 detail about it
- We can see there you say:
- 12 "Good Morning Jon,
- "Sorry but got a headache for you!

"We are being asked by one of our clients to see thetest results and certificates for the RS5000 insulation.

"They want to know exactly how it was installed when tested to BS 8414-2: 2005, who carried out the testing, how it was fixed, what it was covered with, what cladding was used, what support structure, etc and most importantly the results. Drawings and or photos of the test set up would help show how it was installed, but I imagine these form part of the test results anyway.

"They also want to see the certificate and results for the test to BS476 Pt7 (fire class rating), showing the index rating achieved during the test.

122

"Could you sort this out for us please? We are
hoping to put this forward on most of the cladding jobs,
so having this information to hand would be most

4 useful."

5 Do you see that there?

A. Yes.

6

Q. The first question is in relation to what projectwere you enquiring about? You say there in the second

9 line

"We are being asked by one of our clients to see the test results ... for the RS5000 ..."

Can you remember what project that was?

A. No. I mean, at the beginning of 2015 I started to help
 out more with the front end of the building -- of the
 company with estimating, so it was probably to do with
 one of those projects that was being estimated.

17 Q. Right.

Are you able to help us as to whether it might have
been the Grenfell project? We know that the Grenfell
project was ongoing at this time and we know that you
had involvement in it. Could it have been Grenfell that
you were enquiring in relation to?

A. I would have thought it was more likely one of the jobsthat was being estimated and trying to be won at that

25 time.

123

 $1\,$   $\,$  Q. When you say "one of our clients ", what kind of body are

we thinking of there? What does that say to you in

3 terms of who was asking?

 $4 \quad \text{ A. \ \ } Probably \ would \ have \ come \ through \ either \ a \ main$ 

5 contractor or an architect.

6 Q. Yes.

Now, if it was a different project, did you have any concerns that this or similar information was not being asked for by the professionals on the Grenfell project?

10 A. I would have -- well, looking back on it, I would have11 expected that this had already been done on the Grenfell

12 project

13 Q. And who would you have expected to have done that?

14 A. The architect and Building Control.

15 Q. So not Harley?

16 A. No.

17 Q. I see.

 $18\,$   $\,$  A.  $\,$  I  $\,$  would imagine that this  $\,$  was probably to  $\,$  do with one of

the projects which had a performance specification

rather than a prescriptive specification. It was probably that we were being asked to put forward

an insulation that would meet the U-value requirements.

Q. We'll look at what happens, and you do get sent someinformation back from Mr Roome eventually, but can

25 I just check: did you ever think at the time to refer

- 1 this kind of information on to designers either in
- 2 Harley or, say, Studio E at the time of the Grenfell
- 3 project?
- 4 A. No, because, looking back on it, I would have expected
- 5 this work to have already been done. This was for a new
- 6 project, I think, that that hadn't been done on yet.
- 7 SIR MARTIN MOORE-BICK: Sorry, you say that this might have
- 8 been somebody interested in U-values, but none of this
- 9 is concerned with U-values, is it?
- 10 A. No, but this is the only reason that we'd be putting
- 11 forward an insulation, is because we were trying to hit
- 12 a performance-related specification rather than
- 13 a prescriptive one. If it was prescriptive, then it
- 14 would be that this was already in that specification for
- 15 that iob.
- 16 MS GRANGE: But this is all about fire testing, isn't it?
- 17 Fire testing of the RS5000 insulation.
- 18 A. Yes, so if there was a performance specification that
- 19 had a high performance requirement, we would have known
- 20 that the only way we could probably achieve it was with
- 21 one of these high performance insulations, and so we'd
- 22 have to put this forward to that client to see if they
- 23 believed it was compliant or not.
- 24 Q. Isn't it more likely that one of your clients had
- 25 realised that it's important to know the test results

- 1 and details of the testing for the BS 8414 tests that
- 2 were done on RS5000?
- 3 A. I think that it's basically the same thing, that we were
- 4 putting forward a product to meet a performance
- 5 requirement, and they'd probably come back saying that
- 6 they needed to see this information to be able to
- 7 approve that product.
- 8 Q. Yes, isn't it likely that they looked at the RS5000
- 9 information following the launch of that product and
- 10 realised that they needed to know more about exactly how
- 11 it was installed, what it was covered with, what
- 12 cladding was used, et cetera, in order to decide whether
- 13 it might be suitable for another project?
- A. I think we're saying the same thing, aren't we?
- 15 Q. I'm not sure we are.
- 16 A. I'm saying that we'd probably got a performance required
- 17 specification in, we knew it was a high performance
- 18 requirement, so we would have put this forward to them,
- 19 and it would appear that they came back asking for
- 20 additional information.
- 21 SIR MARTIN MOORE-BICK: Does that mean you would have put it
- 22 forward without satisfying yourself that it met the fire
- 23 safety requirements?
- 24 A. Again, because I wasn't educated in fire safety or had
- 25 any training in it, I wouldn't have been able to do more

- 1 than look over the information and pass it on to the 2 people who did.
- 3 MS GRANGE: Did you think about reading the information that
- 4 Jonathan Roome had already sent you? We know you got
- 5 that zip file in August 2014 with all that pack of 6
  - information which would have answered some of these
- 7 questions, wouldn't it, like what cladding was used,
- 8 support structure, et cetera, how it was fixed? Some of
- 9 that was in the pack of information that we looked at
- 10 this morning, wasn't it?
- 11 A. Yes, but I wouldn't have -- I wasn't trained in those
- 12 areas. I wouldn't have known to look back at that
- 13 because they didn't stand out to me in the same way as
- 14 things like Euro codes would.
- 15 Q. Why did you say in the first line:
- 16 "Sorry - but got a headache for you!"
- 17 Why did you consider it would be a headache for
- 18 Celotex to provide this information?
- 19 A. I can't remember.

22

- 20 If you didn't know this area and you didn't know even
- 21 the basics about fire testing, how would you know that
  - it would be difficult -- because that's what "headache"
- 23 implies, isn't it, difficult -- for Celotex to be
- 24 providing this information?
- 25 I'd only be guessing at why I was saying that.

127

- 1 Q. Were you aware at the time that there might be
- 2 difficulties for Mr Roome in disclosing the documents?
- 3 A. I think, looking back at his response to this, there
- 4 must have been some sort of conversations at the time
- 5 that portrayed that, but only from looking back at that.
- 6 I have no memory of it.
- 7 Q. If we look at what you say at the end of that first
- 8 detailed paragraph, three paragraphs down, you say:
- 9 "Drawings and or photos of the test set up would
- 10 help show how it was installed, but I imagine these form
- 11 part of the test results anyway."
- 12 If you didn't know the basics about the fire
- testing, how could you be speculating here that you 14 imagine that they do form part of the test results
- 15
- 16 A. Probably from speaking to the person who was asking for 17
- 18 Q. I see. So you're saying you've got all of this and
  - you're merely a conduit, is that what you're saying,
- 20 between the client that's asking and Celotex?
- 21

13

19

- 22 Q. Were you aware at the time -- I want to put this to you
- 23 directly -- that just because Celotex had passed one
- 24  $8414 \ test$ , that did not mean that it would be suitable
- 25 for all rainscreen applications?

- $1\,$  A. I was aware at the time that, if it was accepted on one
- job, it wouldn't necessarily mean it would be accepted
- 3 on another job, so it was done on a job-by-job basis,
- but I didn't understand what grounds that was on.
- Q. So you didn't understand that it was important to check
   the system that was proposed to be used and whether it
- 7 was the same as the system that had been tested?
- $8\,$   $\,$  A. No, to be honest, I thought it just came down to the
- 9 particular fire consultant or Building Control officer
- who was reviewing the information and how they
- interpreted it.
- 12 Q. Were you aware that the Celotex was not compliant in
- $13 \hspace{1cm} \text{certain circumstances and that was why the provision of} \\$
- $14 \hspace{1cm} \hbox{this information might be difficult } \hspace{0.1cm} \hbox{for Mr Roome?} \\$
- 15 A. I wasn't aware that it wasn't compliant; I was just
- aware that some people might not accept it .
- $17\,$   $\,$  Q.  $\,$  So you weren't aware that, following the guidance -- the
- guidance in, say, paragraph 12.7 of ADB -- this product
- wouldn't meet the limited combustibility requirements?
- 20 You weren't aware of that?
- 21 A. No.
- 22 Q. So can you help us as to why it would be a headache for
- Jonathan Roome to provide this information?
- $24\,$   $\,$  A.  $\,$  I  $\,$  can only draw an assumption based on his response to
- 25 this email, where he says about it being unlikely that

- $1 \qquad \quad \text{any information would be given for parts of } \text{ it .} \quad \text{We must} \\$
- $2\,$  have had a -- well, I assume that we had a conversation
- 3 along those lines at some point previously.
- $4\,$   $\,$  Q.  $\,$  Did you anticipate that Celotex would be reluctant to
- 5 disclose these documents?
- 6 A. I can't remember, but by that start and the response
- 7 I can guess that that must have been along those lines.
- 8 Q. Would you agree that you must have known at the time
- 9 that the precise details of the system tested was
- 10 important, otherwise why be asking Celotex for these
- 11 details?
- 12 A. Because I think I was passing on information.
- $13 \hspace{1cm} \hbox{I wouldn't have known from my own knowledge, but} \\$
- $14 \hspace{1cm} \hbox{I \ probably would have been told \ that \ it \ was important} \\$
- and that was why I had to ask for it, by the client.
- 16 Q. I see. So you didn't ask yourself whether or not this
- was important enough to trouble Celotex with before you
- just passed on the information?
- 19 A. No, I just passed on the information.
- $20\,$  Q. I would suggest to you that, on reading this email, it
- $21 \hspace{1cm} \text{does suggest that you did appreciate how important the} \\$
- exact details of the system that had been tested were?
- $23\,$   $\,$  A.  $\,$  Because I  $\,$  was being asked by somebody who was being very
- specific in what they required.
- 25 Q. Was it your understanding that the way in which the test

- 1 was set up was critical to its reliability?
- $2\,$   $\,$  A. No. Only from what was being asked here, I could have
- 3 drawn that conclusion, but I didn't know it.
- 4 Q. Did this request from your client cause you to
- 5 reconsider the suitability of Celotex RS5000 for use on
  - the Grenfell project?
- 7 A. No, because it was my understanding that these sort of
- 8 checks had already been carried out by the architect and
- 9 Building Control.
- 10 Q. But you had no communications, did you, from Studio E or
- Building Control which said those checks had been
- 12 carried out?
- 13 A. No, because I wasn't the designer on that project.
- 14 Q. Did you know what the BS 476-7 testing was relevant to?
- 15 A. No.

6

- 16 Q. You didn't know that that might be relevant to national
- 17 class 0?
- 18 A. No.
- 19 Q. Did you know why that additional information might be
- 20 relevant to the use of an insulation product?
- 21 A. No.
- 22 Q. Now, finally, you say:
- 23 "We are hoping to put this forward on most of the
- 24 cladding jobs, so having this information to hand would
- be most useful."

131

- 1 Would you agree that that suggests that you did
- $2 \hspace{1cm} \text{recognise at the time how important that information was} \\$
- 3 likely to be? You said it would be "most useful".
- 4 A. I knew that the U-values for jobs were becoming more and
- 5 more difficult to hit, and I knew that Celotex was
- 6 offering a product that could be used over 18 metres and
- 7 was a high-performance insulation that could meet those
- 8 requirements, and for the projects that were coming up,
- 9 which were, you know, showing high performance
- 10 requirements, the only way to satisfy them was to use
- 11 a high-performance insulation.
- $12\,$  Q. But this is nothing to do with U-values, is it? It's to
- $13 \hspace{1cm} \text{do with the fire performance of this insulation product.} \\$
- $14\,$  A. Yes, but to -- the reason why it was going to be put
- forward on most cladding jobs was because it was able to satisfy those high performance requirements, and that on
- those jobs it would be the same process that we would go
- 10
- through on every project where you submitted the information to the design team for its approval.
- information to the design team for its approval. So if you actually had that on file , you'd be able to do it on
- every job.
- 22 Q. Again, I would suggest to you that a more natural
- 23 reading of this email is that you did appreciate that
- 24 these kind of details were important to its compliance
- and its selection on cladding projects?

130

- A. No, I think it is that it would be useful for getting it 2 signed off on other projects.
- 3 Q. Now, if we scroll up, we can see that Mr Roome responds
- 4 on 19 January at 10.57, immediately --
- 5 SIR MARTIN MOORE-BICK: Ms Grange, can I just ask
- 6 a question?
- 7 MS GRANGE: Sorry, yes.
- 8 SIR MARTIN MOORE-BICK: You've spoken more than once about
- 9 recommending high-performance insulation products for
- 10 other projects. Did you have any training or education
- 11 in thermal performance or calculation of U-values and so
- 12

- 13 A. No, I didn't, but I was able to carry out calculations
  - to cross-check what had been put on there, and so you
- 15 could quickly ascertain whether one insulation was going
- 16 to meet those requirements or not.
- 17 SIR MARTIN MOORE-BICK: But you didn't feel able to form
- 18 views about fire performance?
- 19 A. No, because one is a very simple mathematical formula;
- 20 the other one is a very complex set of regulations.
- 21 SIR MARTIN MOORE-BICK: All right. Yes, thank you.
- 22 Yes, Ms Grange.
- 23 MS GRANGE: Before I go to Mr Roome's response, just one
- 24 further question: why were you hoping to put RS5000
- 25 forward on most of your cladding jobs? To what benefit?

133

- 1 A. For the reason I mentioned before, that the jobs that
- 2 had started to come in had very high performance
- 3 requirements from the envelope, and most of the jobs,
- Δ that could only be achieved using a high-performance
- 5 insulation, and Celotex were saying that theirs was
- 6 acceptable for use above 18 metres.
- 7 Q. But if this information was going to be a headache for
- 8 Mr Roome, why were you hoping to put that forward on all
- 9 of your cladding projects?
- 10 A. I think from his reply -- well, because he was saying
- 11 that it could be used above 18 metres, it was the only
- 12 one that would satisfy those U-values and be acceptable
- 13 for use over 18 metres.
- 14 O. Right.
- 15 Now, if we scroll up and look now, we see his
- response is: 16
- 17 "Morning Dan,
- 18 "Hope you had a good weekend.
- 19 "I will check regarding test reports and what we are
- 20 allowed to send out.
- 21 "I will get back to you soon."
- 22 Do you see that there?
- 23 A. Yes.
- 24 Did it concern you that he might not be allowed to send

134

25 out certain test reports relevant to the fire

- 1 performance of this product?
- 2 A. No. At that time my understanding of how test reports
- 3 were written and what they showed was virtually none
- 4 because I was a structural engineer, and so I just
- 5 assumed that there was some sort of privacy rules on it, 6
- but the information that he would be allowed to send
- 7 would be enough to satisfy the consultants.
- 8 Q. But were you not concerned that this was relevant to
- 9 life safety and, therefore, if they were details that
- 10 you needed to see, they ought to be provided? Was that 11
  - not your attitude?
- 12 Yes, I thought that they would be allowed to send out
- 13 enough to satisfy those requirements and to give the
- 14 consultants enough information to be able to sign them
- 15 off. I wasn't worried that the stuff that he wasn't
- 16 allowed to send would impede that in any way.
- 17 Q. Right.
- 18 Then we see your response to that at the bottom of 19 page 1 and on to page 2, on 20 January 2015. Then if we
- 20 go over to the top, you say:
- 21 "Fingers crossed you can get this for us. I am
- 22 worried that if this can't be cleared up, then we will
- 23 have to change to rockwool duo slab as this has the
- 24 necessary backup to appease the 'specialists'!"
  - Do you see that there?

135

1 A. Yes.

25

- 2 Q. Can you help us to understand this comment. What do you
- 3 mean that Rockwool Duo Slab had the necessary back-up to
- 4 appease the specialists?
- 5 That whatever we had submitted to the consultants had 6
  - been approved for the Rockwool Duo Slab.
- 7 Q. Did you understand that that would be about the fire
- 8 performance of the Rockwool Duo Slab, that it had the
- 9 necessary back-up to appease the specialists?
- 10 A. It would be either that -- it could only really be
- 11 the -- it could be a range of things, but it would
- 12 probably be the fire performance, the thermal 13
- performance and whether it was suitable for behind
- 14 a rainscreen for its longevity and durability.
- 15 I would suggest to you it was almost certainly about the
- 16 fire performance because that was the sole topic of your
- 17 email to Mr Roome, was fire performance.
- 18 A. Yes.
- 19 So isn't it likely that the fire performance of the
- 20 Rockwool Duo Slab had satisfied the specialists in that
- 21 job, and you were needing more information from Celotex
- 22 to persuade them that that RS5000 product was
- 23 satisfactory from a fire safety perspective? Isn't that 24 what was happening?

136

25 A. I think that the Rockwool Duo Slab, you know, often

5

- 1 takes up twice as much room as the high-performance
- 2 insulations, and if this job had been drawn with high
- 3 performance, it would have meant going back and
- 4 completely changing the design.
- 5 Q. Would you agree with me that a natural reading of this
- 6 is that you did understand at the time that Rockwool
- 7 Duo Slab had the necessary back-up in terms of fire
- 8 performance to appease the specialists?
- 9 A. I wouldn't have known why they were happy with it, but
- 10 I think I would have known that they were happy with it.
- 11 Q. Why did you put the word "specialists" in inverted
- 12 commas?
- 13 A. Because I think even then I was aware of how broadly
- 14 people interpreted a lot of this information and how on
- 15 one job it might be accepted and on one job it might
- 16 not.
- 17 Q. Yes.
- 18 A. And I think I found that -- being a structural engineer,
- 19 it was always very black and white. There was no grey
- 20 in being a structural engineer. I found it very hard to
- 21 align myself with people who call themselves specialists
- 22 but couldn't agree on something.
- 23 Q. Who are you referring to there? Are you referring to
- 24 architects or fire engineers, can you help us?
- 25 A. I would say architects, fire engineers,

137

- 1 Building Control, thermal consultants.
- 2 Q. Were you sceptical of their specialisms?
- 3 A. I think generally across the board I was.
- 4 Q. Why? Why were you sceptical of them asking for this?
- 5 A. Because you couldn't ever get the same answer twice, it
- 6 felt like.
- 7 Q. Yes.
- 8 A. You could be working in one part of London and they'd
- 9 want it done one way, and you could be working in
- 10 another part of London and they'd want it done another
- 11 way. I personally fail to see how that makes sense.
- 12 Q. Did the specialists ever explain to you why this
- 13 information was required and was necessary for them?
- 14 A. I can only ... I can't remember. It would have been
- 15 that they were -- they wanted to approve the product or
- 16 we wanted them to approve the product. I can't remember
- 17 any conversations about it.
- 18 Q. Did you know that the reason this information was being
- 19 asked by the specialists was because 8414 tests applied
- 20 only to the system as tested?
- 21 A. No, I did not know that.
- 22 Q. So you didn't think that was why the specialists were
- 23 seeking this information?
- 24 A. I just thought that they wanted all of the information

138

25 that they could get to be able to sign it off.

Q. So you commented there that if the information can't be 2 provided, Harley would have to change to Rockwool Duo 3 Slab. That's the phrase you've used:

"... then we will have to change to rockwool duo slab

6 Doesn't that suggest that you had positively 7 suggested RS5000 and it was being queried by specialists

8 on a project? 9 A. I can't remember a time where we ever, you know, started 10 the requirements. Usually the architect knew roughly

11 what he wanted, and he'd know that he wanted

12 a high-performance insulation or a Rockwool insulation,

13 and then we'd go away to come back with a proposal of 14

15 Q. So is your evidence that it was never Harley suggesting 16 that RS5000 was a suitable insulation product for

17 buildings above 18 metres? Is that your evidence?

18 A. Yes.

22

2

3

4

5

6

7

8

9

10

11

14

19 Now, we can see from the email at the top of that page 20 {CEL00000019/1} that, on 21 January 2015, Mr Roome 21 provided you with a number of things. He says this:

"Hi Dan.

23 "I have attached the 12 Page BS8414:2 report showing 24 the build-up and components used. In addition I am 25 sending you the thermocouple graphs showing the

139

1 temperatures at each level of the test.

"I am not able to send you the BS476 test document as this is confidential. I would be surprised if you were able to get this or any other report from the manufacturer to be honest. In lieu of this I have attached the data sheet showing confirmation of the products having BS476 part 6 & 7 which gives it its Class 0 performance in addition to the BS8414 test.

"I would ask that these documents are not shared outside of the network of you and your specialist adviser for this project.

12 "Please give me a call when you have a moment to 13 discuss."

Do you see that?

with them?

15 A.

16 Now, did you read those documents when you were provided 17

18 A. No.

19 You didn't? So you simply passed them on to the 20 specialists on the project?

21 A. Yes, I just -- at that point I wouldn't have known what 22 they're about. I just don't imagine that I would have

23 read them.

24 Q. So that didn't prompt you to look at those documents and 25 then consider whether the RS5000 product was suitable

- for use on Grenfell Tower?
- 2 A. No, because, as far as I was concerned, Grenfell Tower,
- 3 the insulation had already been specified and approved
- 4 by the architect and Building Control.
- 5 Q. Did you think that what you ought to do is send this
- 6 information to other members of the Grenfell project,
- 7 including Kevin Lamb, Studio E, Rydon, so that they were
- 8 aware of it and could use it in making an assessment as
- 9 to whether they should be using RS5000? Did you think
- 10 about that?
- 11 A. No, because I thought it had already been done.
- 12 Q. Well, it hadn't, had it? This is January 2015.
- 13 A. Yes, but as far as I was aware, the product was already
- specified well before I even looked at the -- the first
- time I saw the NBS spec, it was what was in there,
- 16 I think
- 17 Q. But it's not the same product as the NBS specification,
- we've looked at that. The product in the
- NBS specification was FR5000; this is RS5000, isn't it?
- 20 A. Yes.
- 21 Q. So RS5000 hadn't been specified long before, had it?
- 22 A. No, but it's just my recollection of it. I can't
- remember looking at this and having any thoughts as to
- whether there was any doubt by the design team as to the
- use of this on Grenfell . I was under the impression
  - 141
  - $1 \hspace{10mm} \text{that it was already approved.} \\$
  - $2\,$   $\,$  Q. Does that mean that you kept this information to
- 3 yourself within Harley? Did you share it with anybody
- 4 else within Harley?
- 5 A. I don't know.
- 6 Q. You don't know?
- 7 A. No.
- 8 Q. Did it concern you that Mr Roome said he was unable to
- 9 provide the BS 476 test document? We see that in the
- $10 \hspace{1.5cm} second\ paragraph\ where\ he\ says\ it's\ confidential\ . \hspace{0.5cm} Did$
- that concern you at all?
- $12\,$   $\,$  A. No, I would have sent this on, and if it had been
- $13 \qquad \quad \text{a concern for the people who understood it, } I \text{ would have}$
- 14 gone back to him.
- $15\,$   $\,$  Q.  $\,$  When he says "confidential ",  $\,$  what did you understand it
- 16 to mean? Confidential to who?
- A. At the time I was under the impression that Celotex and Kingspan were sort of both competing to get a product
- Kingspan were sort of both competing to get a product that could be used over 18 metres, and I assumed that it
- that could be used over 16 metres, and 1 assumed that it
- 20 was in relation to not letting them see how they were --
- 21 you know, what was their special way of meeting the
- 22 requirement.
- $23\,$   $\,$  Q.  $\,$  I see. So you think Mr Roome was concerned that, what,
- you might pass this information on to Kingspan?
- 25 A. Yes.

- 1 Q. To Celotex's competitor?
- 2 A. Or that they may somehow get sight of it.
- 3 Q. Did you ever clarify that with him and ask him, "Well,
- $4\,$  why is this confidential , confidential to who?" Did you
- 5 ever ask that?
- $\,$  6  $\,$  A. No. All I can remember is the conversations with him at
- 7 the time about how they were the first one to get
- 8 an insulation -- a high-performance insulation that
- 9 could be used above 18 metres and that Kingspan didn't
- 10 have one.

19

22

3

- $11\,$  Q. Did this, this not sharing the 476 test document with
- you, cause you to reconsider whether or not RS5000 ought
- to be used at Grenfell?
- 14 A. No. I think if -- whoever I'd sent this on to,
- 15 I suppose if they'd come back and said that it was
- an issue, it might have raised something, but I don't
- 17 remember it causing any concern.
- 18 Q. So are you saying when you got this email you were 100%
  - confident that RS5000 was an appropriate insulation
- 20 product to use on buildings above 18 metres?
- 21 A. I wasn't educated in that to be able to draw that
  - The transfer of the transfer o
  - conclusion. I was -- I obviously sent this on to
- someone else to check whether it could be.
- 24 Q. If you weren't educated in that, why was it you having
- 25 these conversations with Mr Roome? Why was it you being

143

- 1 the person to ask for this information?
- 2 A. I think because I'd moved over to help Mark Harris out
  - with the estimating. We were just -- it was just
- 4 somebody to do it.
- 5 Q. Did it concern you that at the end of the email he's
- 6 asking that these documents are not shared outside the
- 7 network of you and your specialist adviser for this
- 8 project? Did that concern you, that you wouldn't be
- 9 able to use that information for any other project where
- 10 RS5000 was specified?
- 11 A. No, it didn't. I thought this was just to do with the
- 12 competition with Kingspan.
- 13 Q. Did that not ring any alarm bells for you?
- 14 A. No.
- 15 Q. And can you help us as to what you then did with this
- 16 information when you received it?
- 17 A. I would imagine I passed it on to the client that was
- 18 asking for it.
- 19 Q. And that was all?
- 20 A. Yes.
- 21 Q. So then if we look at another email in this chain, this
- is {CEL00000023}, we can see at the bottom of page 1, on
- 23 21 January at 9.09, you go back to Mr Roome. You say:
- 24 "Morning Jon,
- 25 "Thanks for this, sorry I didn't call back

1

yesterday. We didn't finish till 6 ... "If you do find that you are entering into 2 2 "I will look through it and try and give you a call conversations regarding this subject please let me know 3 3 back. what is being said, and by whom." 4 4 "Kind Regards Do you see that there? 5 "Dan." 5 A. Yes. 6 6 Do you see that there? Q. And it would appear that this again followed a call with 7 7 A. Yes. him, because he says: 8 8 Q. So that does suggest that you intended to look through "Thanks for your time today to get an update ..." 9 9 these documents, not merely pass them on, doesn't it? Or maybe you saw him in person. Can you recall how 10 10 A. No, I think, honestly, I wouldn't have been able to look you'd had contact with him at that point? 11 through them without that training and knowledge, so it 11 A. No, I can't. 12 would have been to look through it just to compare 12 Did you discuss Technical Guidance Note 18 with him in 13 whether he'd sent what had been asked for and whether 13 that conversation, do you think? 14 14 I could send it on or not. A. I don't think so. 15 15 Q. I see. Well, I would suggest to you that a natural Q. You don't think so. 16 reading of this is that you were intending to look 16 I think you told us yesterday that you didn't read 17 through it and look at what information you'd been 17 that Technical Guidance Note 18; is that right? 18 provided with to make at least some assessment of it. 18 A. No, I wasn't familiar with it. 19 19 A. No, I wouldn't have been able to make an assessment. Q. He says, we've just seen: 20 20 I had no training in this at all. So all I could have "If you do find that you are entering into 21 21 done is look through it and see if the information that conversations regarding this subject please let me know 22 22 had been asked for had been sent. what is being said, and by whom." 23 23 Do you know whether you called him back? You say, Would you agree that, reading that, he appears to be 24 24 "I will ... try and give you a call back", do you expecting that you might be entering into conversations 25 25 remember calling him back? about the subject? Do you see that? 145 147 A. No, I don't. 1 A. Yes. 2 2 Q. Or anything about your conversation? Q. And is it possible that that's because that guidance 3 3 made it clear that if the insulation wasn't limited A. No. 4 4 combustibility, it shouldn't be used unless it followed We've checked and we think the first order of RS5000 0. 5 insulation from Celotex through other suppliers like SIG 5 alternative compliance routes? 6 6 is actually 25 March 2015, so after this. So it was not A. That's a conclusion that you could draw now, but at the 7 7 too late on Grenfell at this point to notify people time I didn't understand or hadn't been trained in that, 8 8 about this information, was it, if that's right? to understand that. 9 A. As far as I was aware, that had already been, you know, 9 Q. Were you aware that there was something in that 10 signed off by the architect and Building Control on that 10 technical guidance note that Mr Roome was unhappy with? 11 11 project. A. No. 12 12 Q. So why would he be saying to you: Q. Okay. 13 13 If we go forward in time, sticking with the "If ... you are entering into conversations 14 14 insulation and Mr Roome, we've already seen that he sent regarding this subject please let me know what is being 15 15 said, and by whom." you the Building Control Alliance Technical Guidance 16 16 Note 18 on 8 April 2015. Can we go back to that: Why was he so keen to know what was being said about 17 {CEL00003628}. So this is April 2015, Mr Roome to you: 17 that technical guidance note and by whom? 18 "Hi Dan. 18 I would only be guessing, I'm afraid. I don't know 19

> 146 148

20

21

22

23

24

25

projects and family.

specs for Premier House.

the rounds at the moment.

"Thanks for your time today to get an update on

"Let me know when you have time to go through the

for insulation products above 18m which seem to be doing

"I have attached the Building Control Guidance notes

19

20

21

22

23

24

25

1

whether it would be something that he was positive

Q. Did you ever inform him about conversations you were

that he was negative about in it.

aware of regarding this subject?

Not that I'm aware of.

within that Building Control guidance note or something

It would appear from his email that the documentation

1 1 was "doing the rounds", he says, "seem to be doing the we settle upon." 2 rounds at the moment". 2 Do you see that there? 3 Just to be clear, had you received that guidance 3 A. Yes. 4 4 document or heard about it from anybody else? Q. What's he referring to there? 5 A. No, I think that it may well have been doing the rounds 5 We were buying resin and rods for that project, and he 6 6 for people who were trained in that way and had was offering to match their price. 7 7 an understanding of fire performance, but I certainly O. Yes. And Harley would receive that credit, is that 8 8 hadn't been aware of it doing the rounds. right, if you went with Celotex for those products? 9 9 Q. Was there a continuing relationship between Mr Roome and A. No, this is not Celotex. 10 Harley after this time? 10 Q. Oh, I beg your pardon, you're right. This is when he is 11 A. I believe so, yes. 11 with Hilti; is that correct? 12 Q. Between you and Mr Roome? 12 That's correct. 13 13 A. I believe he kept coming into the office. Yeah, I don't Q. Sorry, I should correct that. This is when 14 remember it changing. 14 Jonathan Roome is at the Hilti company. 15 15 Q. Was it the case that, due to your relationship with While we're in this email, can we look at the email 16 16 Mr Roome, Harley promoted Celotex RS5000 as below that dated 12 July 2013 at 16.37 at the bottom of 17 an appropriate product for use on Grenfell Tower? 17 this page. So this is your email to him about 18 A. No. I think it was my understanding that Celotex had 18 Isis House firebreak visit . You say: 19 19 already been specified on the project. "Jon, 20 20 Q. Was Harley proposing Celotex RS5000 on a number of other "Taff (Mark Osborne) ... 21 "Needs some help on site with the installation of 21 projects at this time? 22 22 A. I don't think we were proposing it on a number of firebreaks to make sure it's being done right, and 23 23 projects; I think that a number of projects had discuss and resolve any problems he may be having." 24 24 high-performance insulations on them, and we were trying Can you just help as to why -- is that Osborne Berry 25 25 to find products that could meet those requirements. you're referring to there? 149 151 1 Q. Did Harley ever receive any financial incentive to 1 2 2. promote or propose RS5000 for its projects? Q. Can you help as to why they were needing help from 3 A. I wouldn't have known or been involved in those kind of 3 Mr Roome, when he was at Hilti, with the installation of firebreaks on Isis House? 4 4 conversations. 5 Q. Or any other form of incentive to be promoting Celotex? 5 A. I think it would be -- it was always normal to get the 6 6 A. No. supplier to visit site and check that the installation 7 7 Q. Can we go then to another email, this is {CEL00008582}. was being done correctly. 8 8 This is an email in relation to a different project, and Q. I see. Had you often asked Mr Roome for help with 9 9 it's going back in time, actually, to July 2013, from installation on site? 10 Mr Roome to you. It's about "Isis House Firebreak 10 A. With structural issues, I had asked him for site testing 11 11 Visit ", do you see that there? of fixings. I don't think he was necessarily the 12 12 specialist for firebreaks. I think that there was A. Yes. 13 13 somebody else in the business who would have been sent Q. He says: 14 "Dan, 14 out for that. 15 "I hope you have had a lovely weekend. 15 Q. Okay. "I have asked one of my colleagues to get in touch. 16 16 Can we now turn to the SIG quotation for the Celotex 17 "I forgot to ask. Who is our competition on the 17 RS5000 for the Grenfell project. This is {CEL00000035}. 18 resin and rods for ISIS." 18 So this is SIG. Can you just tell us who SIG were? 19 19 Do you see that? A. I only know them now, to be honest. I wasn't involved 20 A. Yes. 20 21 Q. What's he referring to there? 21 Q. They're suppliers of insulation, aren't they? 22 A. That's a project called Isis House. 22 A. 23 23 We can see this is a quote from SIG for the attention of Q. At the end of that, he says: 24 24 Ben Bailey, and it's dated 17 March 2015. Do you see "Once I have the competitor info I can review with 25 my boss and raise a credit for the price difference that 25 that there?

150

1 A. Yes.

- 2 Q. What we can see when we look down this invoice is that
- 3 there appears to be a discount of 47.5% in relation to
- $4 \hspace{1.5cm} \hbox{the Celotex product.} \hspace{0.5cm} \hbox{The product is Celotex RS5000} \\$
- 5 specials, quantity: 660, price: £132.19 "per each",
- 6 discount: 47.5. Do you see that there?
- 7 A. Yes.
- 8 Q. Would you agree that that was a hefty discount?
- 9 A. I wouldn't be able to comment on it because I wasn't
- buying those products. I wouldn't know if that was
- 11 normal or abnormal.
- $12\,$   $\,$  Q. So is this your evidence: you weren't aware that, on the
- Grenfell project, you were getting a 47.5% discount on
- the Celotex RS5000 insulation? You weren't aware of
- 15 that?
- 16 A. No, no, I was not.
- 17 Q. Were you aware you were getting any form of discount?
- 18 A. No.
- 19 Q. So can you help us as to whether this discount came from
- 20 Celotex through SIG and on to Harley?
- 21 A. I wouldn't be able to help you with that.
- 22 Q. Well, we can ask Mr Bailey about that.
- What I want to put to you is: was this a reason for
- promoting the RS5000 product over other options at
- $25\,$  Grenfell , because you would receive a very significant

153

- discount?
- 2 A. No. I wasn't aware of it. The only reasons that RS5000
- 3 would have been put forward on any project were that we
- 4 were being told it was appropriate for use above
- 5 18 metres, and it was one of the few insulations that
- 6 was capable of achieving the high performance
- 7 requirements, and then that would have always been sent
- 8 to the architect and Building Control for approval.
- 9 Q. Did you get any discounts on other projects from Celotex 10 for RS5000?
- 11 A. I had no involvement with discounting with Celotex
- 12 products.
- 13 Q. So you weren't aware whether there were any other
- 14 discounts?
- 15 A. No.
- $16\,$  Q. Did you ever get similar discounts from any other
- insulation manufacturers on other projects, for example
- 18 Rockwool?
- 19 A. No, I wouldn't be aware of them if there were.
- Q. We're still sticking with the insulation. I now want toask you about a request for information in
- September 2014, and I'm just going to follow through how
- 23 this came about.
- If we can turn to {HAR00003638}. This is an email

154

25 chain from September 2014. I want to start at the

- 1 bottom of this chain at the bottom of page 4
- 2 {HAR00003638/4}. It begins with you there,
- 3 17 September 2014, sending Simon Lawrence of Rydon,
- 4 Simon O'Connor of Rydon, Neil Crawford of Studio E and
- 5 Bruce Sounes an email about "Grenfell Tower Cavity Fire
- 6 Barriers ". Do you see that there?
- 7 A. Yes.
- 8 Q. You say:
- 9 "Please find attached RFI001 which relates to the
- requirement of firebreaks. This may be something that
  has already been decided, or may need confirmation from
- the local fire officer, as the opinion tends to vary."
- Do you see that there?
- 14 A. Yes.
- 15 Q. So in this email you seem to be having some knowledge of
- what the local fire officer's opinion might be and
- variation in the local fire officers' opinion. Do you
- 18 agree?
- 19 A. I think this goes back to my previous statement that
- even the people in authority did not fully understand
- 21 the requirements and it would just vary from place to
- place. I'm not stating that I know what that particular
- 23 fire officer is going to want.
- 24 Q. Okay.
- 25 A. It's because of that lack of clarity that we ask that

155

- 1 question.
- $2\,$   $\,$  Q. Now, if we turn to that RFI document which was attached
- 3 to the email, this is at  $\{EXO00001291\}$ , we can see that
- 4 this is a request for information form. It's a Harley
- $\,\,\,$  form. It's to Simon Lawrence at Rydon and it's from you
- 6 at Harley. Do you see that there?
- 7 A. Yes.
- 8 Q. 17 September 2014, and you require an answer by
- 9 26 September 2014. We can see that the query:
- 10 "Please may you confirm the required extent of the
- 11 horizontal firebreaks within the cladding areas?"
- Do you see that there?
- 13 A. Yes.
- 14 Q. And then you've put:
- 15 "Suggested Solution:
- "We believe that they will be required at every
- floor level on the vertical columns, but not in the area
- 18 of cladding between windows. This is because there is
- no 'chimney' effect here, and therefore the cladding
- will not add to the spread of fire."
- 21 Do you see that?
- 22 A. Yes.
- 23 Q. Now, did you draft that? Did you put that document
- 24 together?
- 25 A. Yeah, I drafted that.

1	Q.	So do you agree that this suggests that you are	1		believe this interpretation in relation to stack effect
2		professing to have some knowledge or expertise in where	2		is correct?
3		fire barriers are required and whether or not there's	3		"Regards
4		going to be a chimney effect in certain parts of the	4		"Neil ."
5		cladding relevant to the spread of fire? Do you agree?	5		Do you see that there?
6	A.	I think that I didn't fully understand it at that point,	6	A.	Yes.
7		and I think I was just being asked to send an RFI,	7	Q.	At the bottom of page 3 {HAR00003638/3}, we can see that
8		I can't remember by who, but I was asked to send an RFI,	8		Mr Ashton responds with this, he says:
9		because I wouldn't have had enough knowledge to be able	9		"Neil
10		to put that together.	10		"I've never seen details of what you're doing to the
11	Q.	So you're suggesting that this detail, these words, were	11		external walls. Do you have any cross
12		not your own; is that right?	12		sections/elevations?
13	A.	Yes.	13		"Kind regards
14	Q.	That somebody else asked you to send that?	14		"Terry."
15	A.	Yes.	15		Do you see that there?
16	Q.	And who could that have been?	16	A.	Yes.
17	A.	It could have been Mark, it could have been Ray, it	17	Q.	I think we'll see that you get copied in to this chain
18		could have been Kevin.	18		later .
19	Q.	Right, and the part about:	19		Did it concern you that the fire safety consultant
20		"This is because there is no 'chimney' effect here,	20		hadn't seen any details of the proposed works to the
21		and therefore the cladding will not add"	21		external walls?
22		That was not your opinion, is that what you're	22	A.	I wasn't aware of it at that time. I don't think
23		saying?	23		I would have read down the whole email chain. If I got
24	A.	At that time I knew that you were trying to stop the	24		copied back in it later on, I would have read the
25		unseen spread of fire, but I didn't really know	25		response.
		157			159
1	Q.	I suggest	1	Q.	I see. So you didn't think at the time that you ought
1 2		I suggest about it.	1 2	Q.	I see. So you didn't think at the time that you ought to send some details as a matter of urgency to the fire
				Q.	I see. So you didn't think at the time that you ought to send some details as a matter of urgency to the fire engineer on the project?
2	A. Q.	about it.	2	Q.	to send some details as a matter of urgency to the fire engineer on the project?
2	A. Q. A.	about it . Sorry.	2		to send some details as a matter of urgency to the fire engineer on the project?
2 3 4	A. Q. A.	about it. Sorry. I didn't know much about it.	2 3 4		to send some details as a matter of urgency to the fire engineer on the project?  On all other projects the you usually send the
2 3 4 5	A. Q. A.	about it. Sorry. I didn't know much about it. I suggest to you that this does indicate you were	2 3 4 5	A.	to send some details as a matter of urgency to the fire engineer on the project?  On all other projects the you usually send the information to the main contractor and they send it out
2 3 4 5 6	A. Q. A.	about it .  Sorry.  I didn't know much about it.  I suggest to you that this does indicate you were expressing an opinion about the spread of fire and what	2 3 4 5 6	A.	to send some details as a matter of urgency to the fire engineer on the project?  On all other projects the you usually send the information to the main contractor and they send it out to the consultant or the architect.
2 3 4 5 6 7	A. Q. A. Q.	about it .  Sorry.  I didn't know much about it.  I suggest to you that this does indicate you were expressing an opinion about the spread of fire and what was required in terms of fire spread in the external	2 3 4 5 6 7	A.	to send some details as a matter of urgency to the fire engineer on the project?  On all other projects the you usually send the information to the main contractor and they send it out to the consultant or the architect.  Now, after Exova were provided with some Harley plans,
2 3 4 5 6 7 8	A. Q. A. Q.	about it.  Sorry.  I didn't know much about it.  I suggest to you that this does indicate you were expressing an opinion about the spread of fire and what was required in terms of fire spread in the external cladding.	2 3 4 5 6 7 8	A.	to send some details as a matter of urgency to the fire engineer on the project?  On all other projects the you usually send the information to the main contractor and they send it out to the consultant or the architect.  Now, after Exova were provided with some Harley plans,  Mr Ashton then replies on 18 September 2014, so the same
2 3 4 5 6 7 8 9	A. Q. A. Q.	about it.  Sorry.  I didn't know much about it.  I suggest to you that this does indicate you were expressing an opinion about the spread of fire and what was required in terms of fire spread in the external cladding.  I disagree.	2 3 4 5 6 7 8 9	A.	to send some details as a matter of urgency to the fire engineer on the project?  On all other projects the you usually send the information to the main contractor and they send it out to the consultant or the architect.  Now, after Exova were provided with some Harley plans, Mr Ashton then replies on 18 September 2014, so the same day, at 15.32. If we go to the bottom of page 2
2 3 4 5 6 7 8 9	A. Q. A. Q.	about it .  Sorry.  I didn't know much about it.  I suggest to you that this does indicate you were expressing an opinion about the spread of fire and what was required in terms of fire spread in the external cladding.  I disagree.  Do you know what analysis had been done to get to this view?	2 3 4 5 6 7 8 9	A.	to send some details as a matter of urgency to the fire engineer on the project?  On all other projects the you usually send the information to the main contractor and they send it out to the consultant or the architect.  Now, after Exova were provided with some Harley plans, Mr Ashton then replies on 18 September 2014, so the same day, at 15.32. If we go to the bottom of page 2 {HAR00003638/2} and the top of page 3 so if we look
2 3 4 5 6 7 8 9 10 11	A. Q. A. Q.	about it .  Sorry.  I didn't know much about it.  I suggest to you that this does indicate you were expressing an opinion about the spread of fire and what was required in terms of fire spread in the external cladding.  I disagree.  Do you know what analysis had been done to get to this view?	2 3 4 5 6 7 8 9 10	A.	to send some details as a matter of urgency to the fire engineer on the project?  On all other projects the you usually send the information to the main contractor and they send it out to the consultant or the architect.  Now, after Exova were provided with some Harley plans, Mr Ashton then replies on 18 September 2014, so the same day, at 15.32. If we go to the bottom of page 2 {HAR00003638/2} and the top of page 3 so if we look at the very bottom, there's an email, we can just see
2 3 4 5 6 7 8 9 10 11	A. Q. A. Q.	about it.  Sorry.  I didn't know much about it.  I suggest to you that this does indicate you were expressing an opinion about the spread of fire and what was required in terms of fire spread in the external cladding.  I disagree.  Do you know what analysis had been done to get to this view?  No, because I didn't know about where firebreaks were really required.	2 3 4 5 6 7 8 9 10 11 12	A.	to send some details as a matter of urgency to the fire engineer on the project?  On all other projects the you usually send the information to the main contractor and they send it out to the consultant or the architect.  Now, after Exova were provided with some Harley plans, Mr Ashton then replies on 18 September 2014, so the same day, at 15.32. If we go to the bottom of page 2 (HAR00003638/2) and the top of page 3 so if we look at the very bottom, there's an email, we can just see the start of it, from Terry Ashton, 18 September 15.32
2 3 4 5 6 7 8 9 10 11 12 13 14 15	A. Q. A. Q. A.	about it.  Sorry.  I didn't know much about it.  I suggest to you that this does indicate you were expressing an opinion about the spread of fire and what was required in terms of fire spread in the external cladding.  I disagree.  Do you know what analysis had been done to get to this view?  No, because I didn't know about where firebreaks were really required.	2 3 4 5 6 7 8 9 10 11 12 13 14 15	A.	to send some details as a matter of urgency to the fire engineer on the project?  On all other projects the you usually send the information to the main contractor and they send it out to the consultant or the architect.  Now, after Exova were provided with some Harley plans, Mr Ashton then replies on 18 September 2014, so the same day, at 15.32. If we go to the bottom of page 2 (HAR00003638/2) and the top of page 3 so if we look at the very bottom, there's an email, we can just see the start of it, from Terry Ashton, 18 September 15.32 from Terry Ashton. If we go over the page
2 3 4 5 6 7 8 9 10 11 12 13	A. Q. A. Q. A.	about it.  Sorry.  I didn't know much about it. I suggest to you that this does indicate you were expressing an opinion about the spread of fire and what was required in terms of fire spread in the external cladding. I disagree. Do you know what analysis had been done to get to this view?  No, because I didn't know about where firebreaks were really required.  Now, if we return to the email chain, if we go back to	2 3 4 5 6 7 8 9 10 11 12 13 14 15 16	A.	to send some details as a matter of urgency to the fire engineer on the project?  On all other projects the you usually send the information to the main contractor and they send it out to the consultant or the architect.  Now, after Exova were provided with some Harley plans, Mr Ashton then replies on 18 September 2014, so the same day, at 15.32. If we go to the bottom of page 2 {HAR00003638/2} and the top of page 3 so if we look at the very bottom, there's an email, we can just see the start of it, from Terry Ashton, 18 September 15.32 from Terry Ashton. If we go over the page {HAR00003638/3} it's to Neil Crawford he says:  "Neil "If the insulation in the cavities behind the
2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17	A. Q. A. Q. A.	about it.  Sorry.  I didn't know much about it. I suggest to you that this does indicate you were expressing an opinion about the spread of fire and what was required in terms of fire spread in the external cladding. I disagree. Do you know what analysis had been done to get to this view?  No, because I didn't know about where firebreaks were really required.  Now, if we return to the email chain, if we go back to {HAR00003638/4} at the top of the page, we can see that	2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17	A.	to send some details as a matter of urgency to the fire engineer on the project?  On all other projects the you usually send the information to the main contractor and they send it out to the consultant or the architect.  Now, after Exova were provided with some Harley plans, Mr Ashton then replies on 18 September 2014, so the same day, at 15.32. If we go to the bottom of page 2 {HAR00003638/2} and the top of page 3 so if we look at the very bottom, there's an email, we can just see the start of it, from Terry Ashton, 18 September 15.32 from Terry Ashton. If we go over the page {HAR00003638/3} it's to Neil Crawford he says:  "Neil  "If the insulation in the cavities behind the rainscreen cladding is combustible you will need to
2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18	A. Q. A. Q. A.	about it.  Sorry.  I didn't know much about it. I suggest to you that this does indicate you were expressing an opinion about the spread of fire and what was required in terms of fire spread in the external cladding. I disagree. Do you know what analysis had been done to get to this view?  No, because I didn't know about where firebreaks were really required.  Now, if we return to the email chain, if we go back to {HAR00003638/4} at the top of the page, we can see that on 18 September, Neil Crawford of Studio E sends that on to Terry Ashton at Exova. Do you see that there?	2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18	A.	to send some details as a matter of urgency to the fire engineer on the project?  On all other projects the you usually send the information to the main contractor and they send it out to the consultant or the architect.  Now, after Exova were provided with some Harley plans, Mr Ashton then replies on 18 September 2014, so the same day, at 15.32. If we go to the bottom of page 2 {HAR00003638/2} and the top of page 3 so if we look at the very bottom, there's an email, we can just see the start of it, from Terry Ashton, 18 September 15.32 from Terry Ashton. If we go over the page {HAR00003638/3} it's to Neil Crawford he says:  "Neil  "If the insulation in the cavities behind the rainscreen cladding is combustible you will need to provide cavity barrier as shown on your drawing (number
2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19	A. Q. A. Q. A. Q.	about it.  Sorry.  I didn't know much about it. I suggest to you that this does indicate you were expressing an opinion about the spread of fire and what was required in terms of fire spread in the external cladding. I disagree. Do you know what analysis had been done to get to this view?  No, because I didn't know about where firebreaks were really required.  Now, if we return to the email chain, if we go back to {HAR00003638/4} at the top of the page, we can see that on 18 September, Neil Crawford of Studio E sends that on to Terry Ashton at Exova. Do you see that there?  Yes.  He says:	2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18	A.	to send some details as a matter of urgency to the fire engineer on the project?  On all other projects the you usually send the information to the main contractor and they send it out to the consultant or the architect.  Now, after Exova were provided with some Harley plans, Mr Ashton then replies on 18 September 2014, so the same day, at 15.32. If we go to the bottom of page 2 {HAR00003638/2} and the top of page 3 so if we look at the very bottom, there's an email, we can just see the start of it, from Terry Ashton, 18 September 15.32 from Terry Ashton. If we go over the page {HAR00003638/3} it's to Neil Crawford he says:  "Neil  "If the insulation in the cavities behind the rainscreen cladding is combustible you will need to provide cavity barrier as shown on your drawing (number 1279 (06) 120) in order to prevent fire from spreading
2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20	A. Q. A. Q. A. Q. A. A.	about it.  Sorry.  I didn't know much about it. I suggest to you that this does indicate you were expressing an opinion about the spread of fire and what was required in terms of fire spread in the external cladding. I disagree. Do you know what analysis had been done to get to this view?  No, because I didn't know about where firebreaks were really required.  Now, if we return to the email chain, if we go back to {HAR00003638/4} at the top of the page, we can see that on 18 September, Neil Crawford of Studio E sends that on to Terry Ashton at Exova. Do you see that there?  Yes.  He says:  "Hi Terry	2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20	A.	to send some details as a matter of urgency to the fire engineer on the project?  On all other projects the you usually send the information to the main contractor and they send it out to the consultant or the architect.  Now, after Exova were provided with some Harley plans, Mr Ashton then replies on 18 September 2014, so the same day, at 15.32. If we go to the bottom of page 2 {HAR00003638/2} and the top of page 3 so if we look at the very bottom, there's an email, we can just see the start of it, from Terry Ashton, 18 September 15.32 from Terry Ashton. If we go over the page {HAR00003638/3} it's to Neil Crawford he says:  "Neil  "If the insulation in the cavities behind the rainscreen cladding is combustible you will need to provide cavity barrier as shown on your drawing (number 1279 (06) 120) in order to prevent fire from spreading from one flat to the one above even if there isn't
2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21	A. Q. A. Q. A. Q. A. A.	about it.  Sorry.  I didn't know much about it. I suggest to you that this does indicate you were expressing an opinion about the spread of fire and what was required in terms of fire spread in the external cladding. I disagree. Do you know what analysis had been done to get to this view?  No, because I didn't know about where firebreaks were really required.  Now, if we return to the email chain, if we go back to {HAR00003638/4} at the top of the page, we can see that on 18 September, Neil Crawford of Studio E sends that on to Terry Ashton at Exova. Do you see that there?  Yes.  He says:  "Hi Terry "I am working on the Grenfell Tower regeneration	2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21	A.	to send some details as a matter of urgency to the fire engineer on the project?  On all other projects the you usually send the information to the main contractor and they send it out to the consultant or the architect.  Now, after Exova were provided with some Harley plans, Mr Ashton then replies on 18 September 2014, so the same day, at 15.32. If we go to the bottom of page 2 {HAR00003638/2} and the top of page 3 so if we look at the very bottom, there's an email, we can just see the start of it, from Terry Ashton, 18 September 15.32 from Terry Ashton. If we go over the page {HAR00003638/3} it's to Neil Crawford he says:  "Neil  "If the insulation in the cavities behind the rainscreen cladding is combustible you will need to provide cavity barrier as shown on your drawing (number 1279 (06) 120) in order to prevent fire from spreading from one flat to the one above even if there isn't a continuous cavity from the top to the bottom of the
2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22	A. Q. A. Q. A. Q. A. A.	about it.  Sorry.  I didn't know much about it. I suggest to you that this does indicate you were expressing an opinion about the spread of fire and what was required in terms of fire spread in the external cladding. I disagree. Do you know what analysis had been done to get to this view?  No, because I didn't know about where firebreaks were really required.  Now, if we return to the email chain, if we go back to [HAR00003638/4] at the top of the page, we can see that on 18 September, Neil Crawford of Studio E sends that on to Terry Ashton at Exova. Do you see that there?  Yes.  He says:  "Hi Terry "I am working on the Grenfell Tower regeneration project from the Studio E end. The following RFI has	2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22	A.	to send some details as a matter of urgency to the fire engineer on the project?  On all other projects the you usually send the information to the main contractor and they send it out to the consultant or the architect.  Now, after Exova were provided with some Harley plans, Mr Ashton then replies on 18 September 2014, so the same day, at 15.32. If we go to the bottom of page 2 {HAR00003638/2} and the top of page 3 so if we look at the very bottom, there's an email, we can just see the start of it, from Terry Ashton, 18 September 15.32 from Terry Ashton. If we go over the page {HAR00003638/3} it's to Neil Crawford he says:  "Neil  "If the insulation in the cavities behind the rainscreen cladding is combustible you will need to provide cavity barrier as shown on your drawing (number 1279 (06) 120) in order to prevent fire from spreading from one flat to the one above even if there isn't a continuous cavity from the top to the bottom of the building.
2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23	A. Q. A. Q. A. Q. A. A.	about it.  Sorry.  I didn't know much about it. I suggest to you that this does indicate you were expressing an opinion about the spread of fire and what was required in terms of fire spread in the external cladding. I disagree. Do you know what analysis had been done to get to this view?  No, because I didn't know about where firebreaks were really required.  Now, if we return to the email chain, if we go back to {HAR00003638/4} at the top of the page, we can see that on 18 September, Neil Crawford of Studio E sends that on to Terry Ashton at Exova. Do you see that there?  Yes.  He says:  "Hi Terry  "I am working on the Grenfell Tower regeneration project from the Studio E end. The following RFI has come in relating to horizontal firebreaks within the	2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23	A.	to send some details as a matter of urgency to the fire engineer on the project?  On all other projects the you usually send the information to the main contractor and they send it out to the consultant or the architect.  Now, after Exova were provided with some Harley plans, Mr Ashton then replies on 18 September 2014, so the same day, at 15.32. If we go to the bottom of page 2 {HAR00003638/2} and the top of page 3 so if we look at the very bottom, there's an email, we can just see the start of it, from Terry Ashton, 18 September 15.32 from Terry Ashton. If we go over the page {HAR00003638/3} it's to Neil Crawford he says:  "Neil  "If the insulation in the cavities behind the rainscreen cladding is combustible you will need to provide cavity barrier as shown on your drawing (number 1279 (06) 120) in order to prevent fire from spreading from one flat to the one above even if there isn't a continuous cavity from the top to the bottom of the building.  "Kind regards
2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24	A. Q. A. Q. A. Q. A. A.	about it.  Sorry.  I didn't know much about it. I suggest to you that this does indicate you were expressing an opinion about the spread of fire and what was required in terms of fire spread in the external cladding. I disagree. Do you know what analysis had been done to get to this view? No, because I didn't know about where firebreaks were really required. Now, if we return to the email chain, if we go back to {HAR00003638/4} at the top of the page, we can see that on 18 September, Neil Crawford of Studio E sends that on to Terry Ashton at Exova. Do you see that there? Yes. He says:  "Hi Terry "I am working on the Grenfell Tower regeneration project from the Studio E end. The following RFI has come in relating to horizontal firebreaks within the cladding areas.	2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24	A.	to send some details as a matter of urgency to the fire engineer on the project?  On all other projects the you usually send the information to the main contractor and they send it out to the consultant or the architect.  Now, after Exova were provided with some Harley plans, Mr Ashton then replies on 18 September 2014, so the same day, at 15.32. If we go to the bottom of page 2 {HAR00003638/2} and the top of page 3 so if we look at the very bottom, there's an email, we can just see the start of it, from Terry Ashton, 18 September 15.32 from Terry Ashton. If we go over the page {HAR00003638/3} it's to Neil Crawford he says:  "Neil  "If the insulation in the cavities behind the rainscreen cladding is combustible you will need to provide cavity barrier as shown on your drawing (number 1279 (06) 120) in order to prevent fire from spreading from one flat to the one above even if there isn't a continuous cavity from the top to the bottom of the building.  "Kind regards "Terry."
2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23	A. Q. A. Q. A. Q. A. A.	about it.  Sorry.  I didn't know much about it. I suggest to you that this does indicate you were expressing an opinion about the spread of fire and what was required in terms of fire spread in the external cladding. I disagree. Do you know what analysis had been done to get to this view?  No, because I didn't know about where firebreaks were really required.  Now, if we return to the email chain, if we go back to {HAR00003638/4} at the top of the page, we can see that on 18 September, Neil Crawford of Studio E sends that on to Terry Ashton at Exova. Do you see that there?  Yes.  He says:  "Hi Terry  "I am working on the Grenfell Tower regeneration project from the Studio E end. The following RFI has come in relating to horizontal firebreaks within the	2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23	A.	to send some details as a matter of urgency to the fire engineer on the project?  On all other projects the you usually send the information to the main contractor and they send it out to the consultant or the architect.  Now, after Exova were provided with some Harley plans, Mr Ashton then replies on 18 September 2014, so the same day, at 15.32. If we go to the bottom of page 2 {HAR00003638/2} and the top of page 3 so if we look at the very bottom, there's an email, we can just see the start of it, from Terry Ashton, 18 September 15.32 from Terry Ashton. If we go over the page {HAR00003638/3} it's to Neil Crawford he says:  "Neil  "If the insulation in the cavities behind the rainscreen cladding is combustible you will need to provide cavity barrier as shown on your drawing (number 1279 (06) 120) in order to prevent fire from spreading from one flat to the one above even if there isn't a continuous cavity from the top to the bottom of the building.  "Kind regards

A. Yes. 2 Q. Then if we go one page up to the bottom of page 23 {HAR00003638/2}, we can see Neil Crawford sends you that 4 email chain. Neil Crawford to Daniel Anketell-Jones, 5 18 September, 15.50: 6 "Daniel 7 "Please see correspondence relating to RFI001/Cavity 8 Barrier requirement below. 9 "Regards 10 "Neil." 11 Do you see that there? 12 A. Yes. 13 Q. So he's pointing you to that correspondence. 14 A. Yes. 15 Q. Are you saying now that you didn't read down those 16 emails and have a look at what the debate was? 17 A. No, I would have looked at his response but not gone any 18 further. I can't remember going any further. 19 Q. Mr Ashton said {HAR00003638/3}: 20 "If the insulation in the cavities behind the 21 rainscreen cladding is combustible you will need to 22 provide cavity barrier as shown on your drawing ..." 23 What was your reaction to that advice, do you 24 remember? 25 A. No, I don't remember.

1 Q. Do you remember whether you agreed with it or whether 2. you had any concerns with it? 3 A. No, I wasn't able to make a judgement. 4 Q. Okay. So you didn't ever query why Mr Ashton appeared 5 to be linking the combustibility of the insulation to 6 the requirement for cavity barriers? That wasn't 7 something that you ever queried? 8 A. Not that I can remember. 9 Q. Did you think about what guidance Mr Ashton might be 10 referring to when he gave this advice? 11 A. The Building Regulations I would have assumed at that 12 13 Q. But you didn't check at that point and look at, say, 14 Approved Document B to see what he might have been 15 referring to? 16 A. No, because we would always refer back to them for the 17 guidance and follow what they told us. Q. Now, this advice -- if we go up the chain to your email 18 19 immediately above back to Neil Crawford {HAR00003638/1}, 20 you say, Daniel Anketell-Jones, 18 September, same day, 21 16.03 to Neil Crawford, ccing Simon Lawrence and others 22 at Rydon:

1 the correspondence below; I believe that the fire 2 barrier in these locations, will not be necessary. 3 "Can you confirm that this is acceptable?" 4 Do you see that there? 5 A. Yes. 6 Q. Now, I'm going to ask you some questions about that, but 7 I just want to show you another version of that email so 8 I can make good the point that, actually, when you sent 9 that email -- here we're seeing it in a chain, but when 10 you sent it, you also attached the Celotex RS5000 11 datasheet. So if we can pull that up now. So this is 12 at {HAR00012103}. 13 So this is a Harley version of that email, and we 14 can see at the top of that page that here we can see 15 there was an attachment, "Rainscreen cladding product 16 datasheet aug14.pdf". Do you see that at the top? 17 A. Yes. 18 Q. So it's the same email, but we can see here that there 19 was the attachment. I just want to pull up the 20 attachment. It's {HAR00012104}, so it's the next 21 document in the Harley run of docs. This is the RS5000 22 Celotex datasheet. Do you see that? 23 A. 24 Q. Now, was this the first time that you provided Studio E 25 and Rydon with any indication that the insulation was 163 1 going to be RS5000? 2 A. I honestly don't know. 3 Q. You don't know? 4 A. I would have assumed that they were completely aware of 5 what was going to be on there and, you know, at that 6 point I believed that they were the same product that 7 was in the NBS specification. 8 Q. If you thought it was the same product as in the 9 NBS specification , why were you attaching this  $\,RS5000\,$ 10 datasheet for them to see? Why were you telling them 11 what the product was? 12 I would always do that on all projects, would be to send 13 them the actual datasheets. 14 O. Can we go back to the email again and look at it, 15 {HAR00012103}. You say: 16 "The insulation is class 0. Therefore after reading 17 the correspondence below; I believe that the fire 18

barrier in these locations, will not be necessary." 19 Do you see that there?

20 A. Yes.

21 Q. So do you agree that you are giving advice in this email 22 about what your opinion is of the fire classification of 23 the insulation and whether that means that fire barriers 24 are necessary in certain locations? Do you agree? 25 A. No, I disagree. I think that this shows that I didn't

164

"The insulation is class 0. Therefore after reading

"Thank you for your response.

"Neil,

23

24

- $1 \qquad \quad \text{understand the fire} \quad \text{classifications} \ \ \text{,} \ \ \text{that} \ \ I \ \ \text{didn't} \ \ \text{know}$
- 2 where fire barriers were required and that I believed
- 3 that it was up to the consultants to tell us where they
- 4 needed to go.

6

- $5\,$   $\,$  Q. If that's right, why didn't you just respond saying,
  - "I can't help you, I don't know about fire
- 7 classifications , you need to direct your question to the
- 8 fire consultant or Studio E"?
- 9 A. But this is me asking them a question to start with,
- they've come back with another answer, and I'm asking
- 11 them if my interpretation of their answer is correct.
- 12 Q. No, what's happened is Mr Ashton has come back and
  13 queried whether the insulation is combustible and said
- queried whether the insulation is combustible, and said
- 14 if it is combustible you'll need to do certain things.
- $15 \hspace{1cm} \hbox{You've been asked for your response to that, and you} \\$
- 16 have said
- The insulation is class 0. Therefore after reading
- 18 the correspondence below; I believe that the fire
- barrier in these locations, will not be necessary."
- your opinion on fire performance.
- 22 A. No, this is me asking if my interpretation of what
- they've said is correct. They've come back and said
- that it's -- "If it's combustible, you have to do (a)",
- and I've gone back said, "Well, it's class 0, so does
  - 165
  - 1 that mean we can do (b)?"
  - 2 SIR MARTIN MOORE-BICK: Well, it goes a bit further than
- 3 that, doesn't it, because you do seem to be venturing
- 4 an opinion of your own on the basis that --
- 5 A. Yeah, based on what he's replied.
- 6 SIR MARTIN MOORE-BICK: All right.
- 7 A. Then it's clearly stated at the bottom that I'm asking
- 8 whether that's right.
- 9 SIR MARTIN MOORE-BICK: It would seem to reflect your view
- of what's meant by class 0; would that be fair?
- $11\,$  A. Yes, at that time I wasn't trained in fire at all and he
- $12 \hspace{1cm} \text{sent back something about -- that it was -- about what} \\$
- $13 \qquad \quad \text{happens if \ it's \ combustible or not combustible.} \quad I've$
- 14 gone and looked at the sheet and seen that it's class 0,
- so I've sent it back to him asking if the interpretation
- is correct.
- 17 SIR MARTIN MOORE-BICK: Okay, yes.
- $18\,$  MS GRANGE: Why did you think it was relevant to tell people
- $19 \hspace{1cm} \text{that the insulation was class 0?} \hspace{0.2cm} \text{What did you think the} \\$
- 20 relevance of that was?
- $21\,$   $\,$  A. At that time, as I said before, I wasn't trained or
- 22 taught about fire classifications . I'd looked at the
- $23\,$  sheet and that was the only thing that I'd seen on
- there, so I sent it back to him.
- $25\,$  Q. I see. Was that the only check you carried out, to look  $166\,$

- 1 at the datasheet before you responded?
- $2\,$   $\,$  A. Yes, that was -- at that point in my career, that was
- 3 all I would have known to --
- $4\,$   $\,$  Q. You didn't check with anybody else or check any other
- 5 guidance before you responded?
- $\,$  6  $\,$  A. No. I wouldn't have known what else to look for at all .
- 7 I was a structural engineer at that point.
- 8 Q. If we go back to the long email chain, {HAR00003638} --
- 9 sorry, it's not that one. I think what we see is there
- was another request for you to confirm -- that's right,
- sorry, it was in Mr Ashton's -- yes, go back to that,
- $12 \hspace{1.5cm} \{ \text{HAR00003638} \}, \text{ and we look at Mr Ashton's reply that you}$
- $13\,$  were being asked to comment on. So it's the bottom of
- $14\,$  page 2 and on to the top of page 3. If we can go to
- page 3 {HAR00003638/3}, he says:
- $17\,$  ... even if there isn't a continuous cavity from the top
- to the bottom of the building."
- Did you ever confirm whether there was a continuous
- 20 cavity from the top to the bottom of the building?
- 21 A. No.

3

- $22\,$   $\,$  Q.  $\,$  Did you ever go back to Mr Ashton or Mr Crawford about
- 23 the extent of the external wall cavity?
- 24 A. No, I think in this email chain it's only talking about
- 25 the parts between the windows, so I don't think that
  - 167
- 1 part had been discussed yet.
- Q. Do you agree with me that more relevant questions about
  - the insulation were whether the insulation was of
- 4 limited combustibility or whether the system had been
- 5 tested to BR 135 and 8414? Wasn't that where the debate
- 6 should have gone?
- 7 A. Looking back on it now with that knowledge about fire
- 8 performance of products and testing of products, yes,
- 9 but at that point I had no training in that respect,
- which is why I always referred it on to fire engineers.
- 11 Q. If we now turn on and we look at a further development
- on this chain, {HAR00003638/1}, what we see here is in
- 13 the top email Mr Crawford is emailing Terry Ashton and
- ccing you. Again, this is all happening on
- 15 18 September 2014, on the same day. This is now at
  - 17.11. He says:
  - "Hi Terry
- Thank you.
- 19 "Daniel,
- 20 "Can you confirm your position in relation to
- 21 Terry's comment below regarding combustibility and
- continuous cavity paths. Having just finished several
- weeks of fire stopping checks on the Kensington Aldridge
- Academy where John Hoban crawled into almost every
- conceivable cavity possible with a torch (including

168

16

1 nearly falling through a suspended ceiling!) we need to 2 be clear on our position before going to 3 building control. 4 "Regards 5 "Neil." 6 Would you agree that, even though you're only cc-ed 7 in to that, there's a part of that email from 8 Mr Crawford that's directly addressed to you? Do you 9 see that? 10 A. Yes, I can see that. 11 If we look down at what Terry Ashton said below that, he 12 said this: 13 "Neil 14 "A material which has a Class O rating is not 15 necessarily non-combustible although the reverse is 16 invariably true. Some Class 0 products will burn when 17 exposed to a fully developed fire. In any case, you 18 need to prevent fire spread from [one] flat to the flat 19 above as I stated in my earlier email. What isn't clear 20 from the information to hand is whether or not there is 21 a continuous cavity from top to bottom in any part of 22 the cladding (apart from around the column casings) 23 irrespective of the type of insulation." 24 Do you see that there?

169

1 Q. So that's the advice Terry Ashton was giving and you're sent that. Can you recall, what was your reaction to 3 that?

4 A. I can't recall. I believe from seeing information later
5 on that we put in cavity barriers at every floor level,
6 so we must have taken on board what he was saying.

Q. But what was your reaction in terms of what he's saying about the insulation? Because what he's saying there is:

"A material which has a Class 0 rating is not necessarily non-combustible ... Some Class 0 products will burn when exposed to a fully developed fire ."

Isn't that potentially warning you that class 0 is not enough?

A. Honestly, at that point I didn't understand the
difference, and if I'd read this, I can't remember what
I would have thought.

Q. Well, we know you're sent it and you're specifically asked some questions about it by Mr Crawford. Did this email cause you any concern about your statement that the insulation was class 0?

22 A. I can't remember.

25

7

8

9

10

11

12

A. Yes.

Q. Do you know whether it in any way caused you to
 reconsider the assessment of whether Celotex RS5000 was
 suitable for Grenfell Tower?

170

 $1\quad \ A.\quad I \ \ was under the impression that \ the \ Celotex \ product had$ 

 $2 \qquad \quad \text{been already approved by the architect} \ \ \text{and} \\$ 

3 Building Control officer and the fire engineer, so it

4 wouldn't have occurred to me to question them.

Q. I see. So even though the fire engineer is coming back
 and saying to you, "Class 0, you've got to be careful

7 around class 0" -- that's me paraphrasing what he's said

8 in the first couple of lines -- you're saying that

9 didn't prompt any reconsideration in your mind about

whether or not to use RS5000 for the Grenfell project?

A. No, because I thought that all those people had already

12 approved the product.

Q. Did you ever raise the combustibility of the insulation with anyone at Rydon, Exova or Studio E? Did you ever

independently raise that question with them?

16 A. No.

Q. And can you remember ever going back about your position
in relation to Terry's comment below about
combustibility and continuous cavity paths? If we go
back to the email at the top, Neil Crawford is asking
you to confirm your position:

"Can you confirm your position in relation to
 Terry's comment below regarding combustibility and
 continuous cavity paths."

We can't find any response. Do you know if you ever

171

1 did respond to that email?

2 A. I can't remember.

3 Q. You can't remember what advice you gave at that point?

4 A. No.

25

Q. Did you ever take any steps after this to investigate
 further whether the RS5000 product was compliant?

A. No, because, as far as I was concerned, it had already
 been checked for compliance by people who understood it

9 far better than I did.

Q. Did you speak to Celotex again to get any more
 information and to raise with them the fact that class 0
 might not be the entire answer to whether it could be

13 used at Grenfell?

14 A. No, because this didn't jump out at me at that time,

15 I have no memory of it.

Q. Now, I want to put it to you directly before we move on
 from this topic that, if you look at the emails as we've
 done today between you and Mr Roome in August 2014 when
 you're discussing the quantity of RS5000 to use on the

Grenfell project, and you also put it together with this email chain a month later in September where you forward

the RS5000 datasheet and you say the insulation is

class 0, I want to put it to you directly: do you accept that it appears to have been you as the person within

Harley who took the decision to use RS5000 on the

1 Grenfell project? 2 A. No. It was decided long before I was involved. I never 3 put the product forward, never selected it, never made 4 any decision about using it on the project. 5 Q. So can you help us as to who within Harley did authorise 6 the use of RS5000, from Harley's own perspective? 7 A. I don't know. 8 MS GRANGE: Okay. 9 Mr Chairman, I think that would be a good moment for 10 a break because I want to move on to another topic, and 11 I would just like five minutes to review my questions. 12 SIR MARTIN MOORE-BICK: Yes. Let's have a break there, 13 then. 14 We'll have a short break now, Mr Anketell-Jones. 15 We'll come back at 3.30, and then that will give you 16 a little bit more time to organise your questions. 17 MS GRANGE: Yes, thank you. 18 SIR MARTIN MOORE-BICK: No talking to anyone about your 19 evidence, please, while you're out of the room. So if 20 you would like to go with the usher, she'll look after 21 you. Thank you. 22 (Pause) 23 3.30, then, please. 24 (3.14 pm) 25 (A short break) 173 1 (3.30 pm) 2 SIR MARTIN MOORE-BICK: All right. Ready to carry on? 3 THE WITNESS: Yes.

4 SIR MARTIN MOORE-BICK: Good, thank you.

5 Yes, Ms Grange.

6 MS GRANGE: Yes, just to pick up one discrete topic that arose yesterday, which was about CVs. Do you remember 8 we looked at your CV that Rydon had put forward as part

9 of its tender proposals?

10

7

11 Q. You said yesterday that there were certain parts of that

12 CV that weren't accurate, like your involvement in the

13 Chalcots Estate. Do you remember that?

14 A. Yes.

15 And you said that that CV was produced without your

16 knowledge or consent.

17 Can we just look at a document relevant to this 18 story. This is at {RYD00002798}. So this is

19 an email -- you're not copied in here -- from

20 Mark Harris to Simon Lawrence on 6 February 2014, and

21 it's ccing Mike Albiston and Katie Bachellier there.

22 It's about CVs. It says:

23 "Morning Simon

24 "Please find attached CV summary's(sic) of three

25 members of the Harley design and delivery team. There 1 will also be a project specific site manager, but at 2 this stage, I could not confirm a name.

3 "I have purposely kept each CV to a single page, but 4 can elaborate on experience and qualifications for each 5 individual if so desired?

"Alternatively, I can send a full CV for each."

7 Can you see that?

8 A. Yes.

6

12

13

14

15

9 Q. Then we can see that the CVs that were sent were for 10 you, Mark Stapley and Rob Maxwell, and those are the 11 three CVs we see in the Rydon tender package.

> Now, we've checked those CVs that are sent there by Mark Harris, and they are identical to the ones we showed you yesterday in the Rydon tender, including your

16 Now, what I want to ask you -- I appreciate you're 17 not involved in this here -- did Mark Harris check with 18 you whether your CV was accurate before it was sent?

19 Not that I have any recollection of, no.

20 Do you remember having a chance to review the CV before

21 it was sent out?

22 A. I didn't even know it had been sent out.

23 Q. Can you help us as to how Mark Harris might have sent

24 a CV relating to you that had inaccuracies?

25 No, you'd have to ask him.

175

1 Q. Okay.

2

3

Δ

5

6

7

8

9

10

I now want to turn to a bit of a more detailed look at exactly how the design process worked on the Grenfell project, and in due course I'm going to take you to look at the process for approving drawings on the Grenfell project, so that's this topic.

Just to kick that off, were you aware that there were any regular design reviews carried out during the Grenfell project, either formal design reviews or informal design reviews, that happened with Kevin Lamb?

11 A. I would have expected that he would have been sending

12 the drawings to the architect and design team for their

13 review.

14 Q. But did Harley have any kind of processes in place to, 15

if you like, kind of draw a line in the sand and take 16 stock of where the design had got to and review the

17 design as it went through, or was Kevin Lamb just left

18 to get on with dealing with the drawings and sending

19 those to Rydon and Studio E as appropriate?

20 He was left to do the work, yes.

21 Did you personally check the drawings that were being

22 produced by Kevin Lamb?

23 Α. No.

24 Q. You didn't. You don't have any memory of doing that?

25 A. No, I have a memory of passing some on to the managing

1 1 director for him to check, but I was working on another general assembly drawings by Kevin Lamb? 2 2 project. A. I don't remember, but I've been shown the emails where 3 3 Q. Okay. We will look at some emails relevant to that in it happened. 4 4 a moment. Q. And you agree that it did happen? 5 Do you accept that you were regularly copied in to 5 A. Yes. 6 6 Q. Yes. emails on the project? 7 7 A. From what I've been shown, yes. Can we look at another example. So if we go to 8 8 Yes. So even after Mr Lamb's appointment, you were {HAR00003634}. This is 22 September 2014, if we look in 9 9 regularly copied in to emails about the project; yes? the email at the top, from you to Kevin Lamb, subject: 10 10 A. Yeah, for a period. "Grenfell Design": 11 Q. When you say "for a period", what do you mean by that? 11 "Kev 12 A. At some point I became completely uninvolved with the 12 "Could you make one change - detail 304 - change it 13 13 project. I can't remember when it was, but I think that to 2 angles in the shadow gap to allow for tolerance. 14 14 at some point I stopped receiving emails on the project. "These can be issued then. 15 15 "Will you be able to attend tomorrow's meeting? Q. Can we just look at something that Mr Albiston has said 16 16 in his witness statement about your role. If we look at Will you be able to table the other details then? 17 {HAR00010151/3} at paragraph 9, I want to pick up -- so 17 "Kind regards 18 18 this is Mr Albiston's witness statement. Three lines "Daniel ..." 19 19 down, he says this: Do you see that there? 20 20 "The specification was also reviewed by Daniel A. Yes. 21 21 You said earlier that you weren't personally checking Anketell-Jones (Harley). Daniel Anketell-Jones would 0. 22 22 have been looking at the tender documents from a more any of the drawings that were produced by Kevin Lamb. 23 23 technical and design point of view. For example he Do you agree that this suggests that you did sometimes 24 24 would be looking to see that the materials specified check the drawings? 25 25 were suitable for that job." I would have been checking them for structural 177 179 1 1 Do you see that there? requirements and sort of fabrication things to make sure 2 2 A. Yes. that they could be installed. But I would expect 3 Q. I wanted to give you the chance to respond to what 3 everything to do with other elements of performance that 4 4 Mr Albiston said there about your role. Do you agree I wasn't concerned with to go back to the architect and 5 with his description? 5 Building Control, such as, you know, conformity to 6 6 A. No, I think that again it's a -- there's confusion in Building Regulations. These were, you know, looking at 7 7 timeframes, because at this point I hadn't -- I wasn't them from a point of view of structural performance and 8 8 educated enough or hadn't done enough of the MSc to be whether it can be fabricated. 9 able to be responsible for those sorts of things. 9 Q. I see. What's this an example of, angles in the shadow 10 Q. I just want to look at some exchanges between you and 10 gap, would you say that's fabrication? 11 11 Mr Lamb. To start with, the witness statement of A. Yes. 12 Kevin Lamb, this is {HAR00010419/5}, and I want to look 12 Can we look at some more examples. If we go to 13 at paragraph 22. So if we look down there, he's talking 13 {HAR00003636}, this is on 25 September 2014. We can see 14 about some Studio E drawings forming the basis of his 14 from the bottom email that Kevin said: 15 design, "along with discussions with both Daniel 15 "Please check attached. 16 16 Anketell-Jones and Ray Bailey ". Do you see that? "The vents do not quite manage 5000mm2 ... 17 A. Yes. 17 increasing the vent width ... will get that, however didn't you mention only 2500mm2 when we were at the 18 Q. Then he says this: 18 19 19 "I sent preliminary, key concept general assembly meeting? 20 drawings on 20th August 2014 to Daniel Anketell-Jones 20 "Regards

178 180

21

22

23

24

25

"Kevin ..."

everyone please?"

Then above that, you've said:

Do you see that there?

"These look fine to me. Can you issue them to

Studio E."

for his input and approval to issue to Rydon and

Q. Now, do you remember being sent those key concept

Do you see that there?

21

22

23

24

1 A. Yes. 1 work? 2 2 Q. And we can also see you potentially amending drawings A. No. No. 3 in November 2014. If we go to {HAR00003785}, this is on 3 Q. And just going back to how much time you were spending 4 4 20 November from Mark Stapley to Kevin Lamb, ccing you on the project, we know that you were doing the façade 5 and Rob Maxwell. He says: 5 degree part-time. Is it right, I think you said 6 6 "Hi Kevin, yesterday, was that one day a week you were taking out 7 7 "Thanks for sending over the [drawings]. Dan is studying on that course? 8 8 going to modify die drawings EX03 and 04 so that we can A. No, you would have a week out at a time, and then you reduce the width to 120mm, this will be achieved by 9 9 would usually have a week to do the work that had been 10 10 increasing the wall thickness on the leg with the set afterwards. 11 serrated edge." 11 Q. So during the time you were doing that course, what 12 Do you see that there? 12 would you say, what percentage of your time for Harley 13 13 A. Yes. was taken out by doing that course, would you estimate? 14 14 Q. That suggests you were going to modify a drawing at some A. I think over the course of the year it would be 15 15 point or drawings? Do you agree? eight weeks. 16 16 Yes, these were the structural drawings for the dies. Q. Yes, okay. 17 I would have been involved in that. 17 Now, we can see later in the project that there are 18 Q. Yes. 18 examples where many drawings are issued without your 19 19 Then could we move on to 7 May 2015. This is approval or prior review. Let's just look at an example 20 20 {HAR00004089}, and this is Grenfell Tower, 7 May 2015, of that. This is {SEA00013350}. So this is Kevin Lamb 21 21 so much further on in time, and you say: on 18 August 2015, so later in time, to Simon Lawrence, 22 22 "Hi Kev. copying in Ben Bailey, Mark Stapley, you, Ray Bailey, 23 23 "When you get a sec would you mind sending me the Neil Crawford. There's a lot of drawings, GA 24 latest [drawing] model for Grenfell. I'm trying to 24 drawings -- are they general arrangement drawings? --25 25 catch up with all the calcs. that are being issued at that time, do you see that 181 183 1 1 "Thanks there? 2 "Dan." 2 A. Yes. 3 3 Do you see that there? Q. He says: 4 4 "Neil, A. Yes. 5 Then the response is at {HAR00004224}, if we can look at 5 "Please find attached curtain wall drawings all now 6 6 that. There he says: issued for construction based upon your comments 7 7 "Dan, 07.08.15. 8 8 "Attached, however the layout has become a bit messy "The only item that has deviated from your mark ups 9 9 so please call if you can't locate the info you want." are the internal jamb flashings on [drawing] 352 ..." 10 Do you see that there? 10 Do you see that there? 11 11 A. Yes. Now, those seem to be curtain wall drawings; does 12 Can you help us as to what you were going to be checking 12 that mean they were probably about the lower levels of 13 13 on these drawings? the tower? 14 A. For every project it needs a set of structural 14 A. Yes. 15 15 calculations. Through the design process, you do each Q. In practice, how did you decide which of Mr Lamb's 16 bit as it's required and submit it, and then you 16 drawings to check? Was there some kind of system or 17 probably do a complete tidy-up at some point. I think 17 practice that you were following in terms of what you 18 I was just trying to do a tidy-up and make sure that 18 would be checking of his work and what you wouldn't 19 19 everything was as had been drawn, so all the right check? 20 angles were aligned with what was in the calculations 20 Α. No, it would only be from individual discussions. 21 21 before, you know, doing a final submittal. Sometimes he'd send something to me and I might print it 22 22 Q. Right, yes. off and take it up to Ray to look at, but generally it 23 23 Did you ever come across any issues with Mr Lamb's would be almost entirely kept to the structural parts, 24 24 because he had prior knowledge of, you know, detailing work, whether one-off issues or recurrent issues?

184

25

Did you ever have cause to speak to him about his design

182

25

and fabrication to be able to proceed on his own.

Q. At this point, I just want to ask you some more detailed 2 questions about the process for approving or signing off 3 on drawings.

> Can you explain to us in general terms what the process was by which drawings were issued by Harley and then checked and signed off? What was your understanding of the process that was followed at Grenfell?

- 9 A. On Grenfell I'd only be making an assumption. I can 10 tell you what it was on other projects and how Grenfell 11 would have worked from that.
- 12 So does that mean at the time you weren't aware of what 13 the process was for --
- 14 A. No, I wasn't -- I wasn't submitting drawings or getting 15 comments back. I was primarily concerned that the work
- 16 was happening.
- 17 Q. If you're line-managing Kevin Lamb, you're the design 18 manager and he's the project designer, how would he know
- 19 what the process was for getting drawings issued and
- 20 approved and signed off if you don't know? How would he
- 21

4

5

6

7

8

- 22 A. Any time that we brought in an external designer before,
- 23 it wasn't like the designers in the office. You're
- 24 trying to bring in someone who is competent and capable
- 25 of running on their own. With an external designer, the

185

- 1 checks you're doing is making sure that they're keeping 2 to programme.
- 3 Q. So does that mean you expected Kevin Lamb off his own
- 4 back to be in touch with Rydon and Studio E to discuss
- 5 what the process was for approving drawings?
- 6 A. Yes, as the designer on the project, that's what you'd 7 expect.
- 8 Q. I see. So that was your expectation, was it? And
- 9 did you understand that Kevin Lamb was doing that, was
- 10 checking with Rydon and others what the process was for 11 approving drawings?
- 12 I would have thought that 'that's what had happened, yes.
- 13 Q. Can we just look at a few examples of what seemed to happen with some of the drawings in terms of the process
- 14
- 15 for getting them finally signed off and approved for
- 16 construction. Can you turn to {SEA00012756}, and I want 17 to start by looking at the email at the bottom of page 1
- 18 and over on to page 2.
- 19 So right at the bottom there we see, on
- 20 17 February 2015 at 11.05, Kevin Lamb is sending
- 21 an email to Neil Crawford, Bruce Sounes, you,
- 22 Mark Stapley, Rob Maxwell, Ben Bailey, and if we go over
- 23 to the next page {SEA00012756/2}, he says -- is that the
- 24 very top of that page? Can we maybe go back to the
- 25 bottom of page 1. Yes, sorry, it's important to note

186

- 1 he's addressing that to Simon, do you see that,
- 2 Simon Lawrence? Do you see that there at the very
- 3 bottom of the page?
- 4 A.

6

- 5 The email of 17 February at 11.04, "Simon", so this is
  - Simon Lawrence of Rydon. Then over the next page he's
- 7
- 8 "Please find attached revised type 10 windows, now 9 with symmetry as requested.
- 10 "Please approve and forward your official
- 11 instruction for us so as we can proceed with remakes of
- 12 those in manufacture."
- 13 Do you see that there?
- 14 A. Yes
- 15 Q. So this is Kevin Lamb sending to Simon Lawrence for
- 16
- 17 Now, looking up this email chain, if we go back on 18 to page 1 (SEA00012756/1), we can see that Neil Crawford
- 19 at Studio E then responds on the same day at 12.12:
- 20 "Hi Kevin
- 21 "Please see attached comment."
- 22 Do you see that there?
- 23 A. Yes.
- 24 Q. So Kevin Lamb is addressing his initial email to
- 25 Simon Lawrence, but it's Neil Crawford who is responding

187

- 1 first. Do you see that there?
- 2 A. Yes.
- 3 Who, on your understanding, was responsible for checking
- 4 and approving the drawings for construction?
- 5 It would have been the architect.
- 6 Q. The architect, Neil Crawford, so not Rydon?
- 7 A. No.
- 8 Q. And what would that checking and approval process
- 9 actually entail? Did you have an understanding of it?
- 10 A. Not on Grenfell. It was never specifically spelt out.
- 11 I would be guessing.
- 12 Q. Okay.
- 13 Now, if we turn to the drawing that Mr Crawford
- 14 attaches with his comment, if we go to {SEA00003093},
- 15 this is Mr Crawford's annotation on that drawing. We
- 16 can see what he's done, and I think he confirmed that
- 17 was his writing in red. Do you see that there?
- 18 A. Yes.
- 19 Q. So he's made a comment:
- 20 "Better to hinge this way as per sketch of
- 21 email ..."
- 22 Do you see that there?
- 23 A. Yes
- 24 Q. And he's marked it in the stamp on the right-hand side,
- 25 the Studio E architect's stamp, he's marked it status B.

Now, it's a little bit difficult to read here, but what status B says there is:

3 "Conforms to design intent subject to incorporation

- 4 of comments. Revise and resubmit for category A status."
- -
- 6 Do you see that there?
- 7 A. Yes.
- 8 Q. Now, was it your understanding on the project that, in
- 9 these circumstances, the drawings did have to be
- 10 resubmitted after incorporation of Neil Crawford's
- 11 comments?
- 12 A. Sorry, can you re-read the bit in -- that is not clear?
- 13 Q. Yes. You want me to re-read the category B comment?
- 14 A. Yes, please.
- 15 Q. Yes, so what it says is:
- "Conforms to design intent subject to incorporation
- of comments. Revise and resubmit for category  ${\tt A}$
- 18 status."
- Now, my question to you is: was it your
- 20 understanding in these circumstances -- so where it's
- 21 marked category B, it's not A, it's not "Conforms to
- design intent" -- that the drawing should be resubmitted
- 23 to the architect after incorporating the comments they'd
- 24 made?
- 25 A. Trying to look back on it, I have no memory of any

189

- 1 conclusions I would have drawn on this.
- 2 Q. Yes. So you can't help us as to whether it routinely
- $3 \qquad \quad \text{happened on the project that the drawings would be} \\$
- 4 resubmitted to get the category A status?
- 5 A. No, I can't help you on that.
- 6 Q. Now, also on this drawing we can see a printed stamp on
- 7 the bottom right of the drawing, if we zoom out again.
- 8 Can you see there someone has put "Approved for
- 9 construction" on the bottom? There's a stamp there. Do
- 10 you see that?
- 11 A. Yes.
- $12\,$   $\,$  Q.  $\,$  Now, do you know who applied that stamp or who would
- have applied that stamp to this drawing?
- 14 A. I don't know who did it, no, but --
- 15 Q. It appears to us to be -- this is a Harley drawing and
- it appears that Harley had stamped it "Approved for
- 17 construction" before it had been reviewed by
- Neil Crawford and his stamp.
- $19\,$  A. I mean, there's a lot of revisions there. I mean, how
- 20 would you know he hadn't checked it at one of those
- 21 previous revisions?
- 22 Q. Right, well, I think we've tried to check and we're not
- aware that this drawing did get category A status prior
- 24 to this.
- Were you aware on other drawings of these drawings

190

- being approved for construction with that kind of stamp
- before they'd been sent to Studio E or indeed Rydon?
- 3 A. No, I wasn't aware.
- 4 Q. Whose role would you have thought it was to apply that
- 5 "Approved for construction" stamp on the project?
- $\boldsymbol{6}$   $\,$  A. It would be the designer's role to put that on on their
- 7 interpretation of that statement next to the B.
- 8 Q. So would you expect Mr Lamb to be applying that
- 9 "Approved for construction" stamp after they've got
- 10 a category A from the architect?
- 11 A. I think, re-reading this now, I would still read that as
- $12 \hspace{1cm} \text{that you resubmit it with those comments incorporated} \\$
- means that it has a category A.
- 14 Q. I see. So you're saying that we can read this not as
- a category B but as category A, assuming these comments
- are going to be incorporated?
- 17 A. Yes.
- 18 Q. But wouldn't the architect want to check that whatever
- comments had been made had been properly transposed over
- 20 to the next version of the drawings?
- 21 A. I mean, talking from experience now, it's commonly done
- that way, that the architect will put his comments on
- the drawing, and he'll status it that if the drawing --
- 24 if those comments are incorporated, it can be assumed
- 25 that it's a status A.

191

- 1 Q. But that's not what the B stamp says here, is it?
- 2 A. No. Reading it now, that's the way that I interpret it.
- 3 O. I see
- 4 So just following the story of this drawing a bit
- 5 further, if we go to {SEA00012758}, this is a further
- 6 email from Kevin Lamb on that day, 17 February 2015, to
- 7 Simon Lawrence again, ccing Neil Crawford and others,
- 8 including you, on the Grenfell project, and he says:
  - "Simon,
- 10 "The window mods are now approved by Neil (as
- 11 attached), so all we need now is your official go ahead
- 12 to proceed."
- Do you see that there?
- 14 A. Yes.

9

- 15 Q. So was it your understanding that ultimately
- Simon Lawrence of Rydon had the final responsibility of
- approving the drawings for construction?
- 18 A. No, I didn't have that understanding.
- Q. And who was it you thought was responsible for approvingthe drawings for construction?
- $21\,$   $\,$  A. To approve them for construction,  $\,I\,$  would have thought
- it was the architect.
- 23 Q. I see.
- $24\,$   $\,$  Do you think this might have been a special case

192

where Harley or Kevin Lamb here wanted an instruction

1 2		from Rydon over and above the normal process to proceed with the drawings?	1 2	Q.	We can then see at the top of this email chain that Neil responds to Kevin and says:
3	Δ	I don't know what the timeframes are here, but I would	3		"Please find attached comments on the Crown
4	л.	have thought it was a again, I'm just guessing	4		drawings."
5		that it was to do because it was ordering materials	5		Do you see that there?
6		and he wanted to be certain that everyone was happy with	6	٨	Yes.
7		it.	7	о. О.	
	0			Ų.	If we look at the attachment to that, this is
8	Ų.	Right.	8		{RYD00043547/4}. We can see that Neil Crawford has
9		If we just finish this off, if we go to	9		stamped the drawing status B, and annotated the drawing
10		(SEA00012761), we see Simon Lawrence replies to this	10		regarding metal copings and flashing at the roof
11		chain. There we have that. Again, you're copied in:	11		parapet. Do you see that there? There's the red
12		"Hi Kevin	12		comment and the bubbles.
13		"Neil has completed his comments and is happy. So	13	A.	Yes.
14		you can proceed."	14	Q.	He says:
15		Do you see that there?	15		"Existing roof parapet requires to be surveyed and
16	A.	Yes.	16		metal copings/flashings to fit over."
17	Q.	So you can't help us as to whether that process was	17		Do you see that there?
18		typical of the process that was adopted for assessment	18	A.	Yes.
19		and approval of drawings on the project?	19	Q.	He's marked it status B again. Do you see that there?
20	A.	Not for this project, no.	20	A.	Yes.
21	Q.	Would it be fair to say that this step-by-step process	21	Q.	It's clearly B, not A.
22		didn't always occur in such a clear manner in respect of	22		If we can now turn to {SEA00013262}, we can see from
23		amendments to and approval of Harley drawings?	23		the bottom email that Mr Lamb then sends another email
24	A.		24		to Simon Lawrence, copying you and others in, on
25	Q.		25		1 July 2015, and he says:
	٧.				
		193			195
1		process sending it to Rydon, waiting for the	1		"Neil,
2		architect comments, getting it back and then Rydon	2		"Please find attached revised coping detail to the
3		confirming again that they're happy didn't always	3		Crown element."
4		occur in respect of amendments to and approval of Harley	4		Do you see that there?
5		drawings? Would you agree with that?	5	A.	Yes.
6	A.	I was under the belief that the process of sending them	6	Q.	He says:
7		to the architect and getting them approved did always	7		"If you could have a quick look and pass your
8		happen.	8		comments, we shall then reissue the whole of this
9	Q.		9		element for construction, based upon your previous
10	ζ.	{SEA00013221}, and I want to look at the second email at	10		approvals."
11		the bottom of page 1. This is 29 May, from Kevin Lamb	11	Α	Yes.
12		to Simon Lawrence, ccing the same individuals in. He	12	Q.	And he makes another comment about the shorter coping in
13			13	Q.	. •
		writes:	14		the last line.
14		"Neil,			Then if we go up, we can see that Mr Lamb has
15		"Please find attached drawings for the Crown element	15		actually sent it initially to the wrong Neil and then
16		for approval."	16		sends it to the right Neil. Then Neil Crawford at the
17		Do you see that there?	17		top of that page responds on 1 July:
18	A.	Yes.	18		"Hi Kevin
19	Q.	So although the email is being sent by Kevin to	19		"Please see attached.
20		Simon Lawrence, it's being addressed in the body of the	20		"Regards
21		email to Neil Crawford. Do you see that there?	21		"Neil ."
22	A.	Yes.	22		Do you see that there? And attaches another
23	Q.	Can you help us as to why he would have sent it to Simon	23		drawing.
24		but addressed it to Neil?	24		If we can look at that, that's at $\{SEA00013263\}$ . So
25	A.	No, I can't.	25		we think that's the same drawing. This time we've got

1		status A, "Window head/coping", "Conforms to design	1		Do you see that there?
2		intent", do you see that there	2	A.	Yes.
3	A.	Yes.	3	Q.	Now, one of those, in the second line of the
4	Q.	in the Studio E stamp?	4		attachments, the middle drawing is one called, "C1059
5		If we keep following the story of this same drawing,	5		GA Model 50 223". Do you see that?
6		can we now turn to {HAR00004443}, and if we look at	6	A.	Yes.
7		this, this is from Kevin Lamb to Simon Lawrence, copying	7	Q.	If we can turn that up, this is {SEA00003316}.
8		in others, but again it's addressed to Neil, and it	8		We can see clearly here that this hasn't got
9		says:	9		a Studio E stamp, so it has not yet been reviewed by
10		"Main entrance adjusted as per your further comments	10		Mr Crawford, but we can see in the bottom right-hand
11		this morning.	11		corner that it's said to be "Approved for construction".
12		"Cladding [drawing] just with additional set out	12		Do you see that there?
13		info for the installers ."	13	A.	Yes.
14		Do you see that there?	14	Q.	Can you help us as to why this drawing would be said to
15	A.	Yes.	15		be approved for construction when it hasn't yet been
16	Q.	So it would appear that Neil Crawford makes some	16		considered by the architect?
17		additional comments on the drawing, and then	17	A.	No, I wouldn't.
18		Neil Crawford to Kevin Lamb:	18	Q.	Mr Crawford then replies to the email, if we turn to
19		"No further comments as attached."	19		$\{HAR00004669\}$ , we have Mr Crawford, 22 October 2015,
20		If we go to that attachment, if we go to	20		saying:
21		{SEA00003310/3}, we can see that this is now revision B	21		"Hi Kevin
22		of the drawing, which was amended on 26 August 2015. We	22		"Please see attached comments on ground floor."
23		can see that at the bottom. Do you see that there?	23		Then if we turn to the attachments and the drawing
24	A.	Yes. At the start of this chain it was talking about	24		that we were looking at, which is the C1059 223 drawing,
25		the crown, then this last email it was talking about the	25		if we go to $\{HAR00004670/3\}$ , here we can see that
		197			199
1		main entrance.	1		Mr Crawford has made a number of comments to the drawing
2	Q.	Yes.	2		and stamped it status B. Do you see that there?

- A. But then it's --
- 4 Q. Then it's back to this again. This appears to be the 5 drawing that's attached --
- 6 A. Okay.

14

- 7 Q. -- we think by Neil Crawford and it's marked status A.
- 8 What I wanted to ask you is, in that example it 9 appeared to be Neil Crawford responding saying, "Hi
- 10 Kevin, no further comments as attached", whereas before
- 11 it was sent to Simon Lawrence.
- 12 Again, my question is: can you help us as to which 13 was more representative of the typical approach to

drawings? Was it Simon Lawrence or Neil Crawford who

- 15 ultimately approved the drawings for construction?
- 16 A. I wasn't working closely enough to it to be able to say 17 definitely, but it was always my impression that it was
- 18 the architect who was approving drawings.
- 19 Can we look now at {HAR00004590}. This is an email of
- 20 20 October 2015 from Kevin Lamb to Simon Lawrence,
- 21 copying you and others in. There's a large number of 22 drawings there. He writes, "Neil", so he's addressing
- 23 it again to Neil Crawford:
- 24 "Please find attached GF Curtain wall elements for

198

25 comment/approval."

- ing
- 3
- 4 Now, following this drawing through, Mr Lamb then
- 5 responds to Mr Crawford's email. This is {HAR00004743}.
- 6 So this is Kevin Lamb to Neil Crawford at Studio E,
- 7 26 November 2015. He copies a number of people at
- 8 Harley, including you, but Simon Lawrence isn't copied
- 9 in to this email or sent this email. He says:
- 10 "Neil,
- 11 "Please find attached GF curtain wall drawings,
- 12 revised in accordance with your comments."
- 13 Do you see that there?
- 14 A. Yes.
- 15 Q. And in the attachments that same drawing, "C1059 GA
- 16 Model 51 223A" is there, and that's revision A of the
- 17 drawing.
- 18 If we can turn now to {HAR00001999}, this is
- 19 an email on the same date, 26 November 2015, from 20 Ben Bailey to Mike and Lucy at AGF. They're Aluminium
- 21 Glass Façades Limited, I think they're a fabricator; is
- 22 that right?
- 23 A. I don't know, to be honest.
- 24 Q. And Ben Bailey writes:
- 25 "Please see our construction issue drawings attached

for Grenfell Tower."

1

2

3

4

5

6

7

8

9

10

11

12

13

14

1

We can see the second email down on this chain is the email from Kevin Lamb returning the revised drawings to Neil Crawford. If we look down that page, that was Kevin Lamb returning them to Neil Crawford. If we go over to the next page {HAR00001999/2}, we can see that. But we can't find any response from Neil Crawford confirming the revisions are acceptable and stamping the drawings status A, and yet it's been sent by Ben Bailey to the fabricators.

The question that we wanted to put to you is: would it be usual for Harley to send out construction issue drawings without waiting for Studio E to revert with a stamped status A drawing?

- 15 A. It wouldn't be normal on other projects, no.
- Q. Do you agree it would be best practice to wait for
   Mr Crawford to return having marked the drawings as
- 18 status A?
- A. The only reason that you'd send them out beforehand is if you were trying to get approximate pricing for something, otherwise it would be best practice.
- Q. Do you agree that that might deprive Studio E and Rydonof the opportunity to see the final version before it
- 24 was issued for construction?

25 A. If that was done, yes.

201

Q. Was there anyone supervising you as the design manager

- 2 during the Grenfell project? So we've talked about your 3 supervision of Mr Lamb, but was anybody supervising you Δ as his design manager? 5 A. I wasn't his design manager on anything more than 6 programme, and that was to be reported back to the 7 project manager and the contracts manager, so they would 8 have been interested in how he was maintaining 9 programme, and it would have been reported back that 10 way. My line manager was Mark Stapley. But every time 11 that we brought in an external design resource, it was 12 that they were, you know, competent to do the work under 13 their own steam. They wouldn't be line-managed from 14 a point of view of checking the quality of their work. 15 The point of going to an external design resource at 16 that time was because you needed someone who was capable 17 and wasn't going to be -- have to have someone shadowing
- 19 Q. Yes, okay.

all their work.

18

On projects of this size and complexity, in your experience, would it be normal to have a matrix of responsibilities setting out which contractor or subcontractor was responsible for each element of the design?

 $25\,$  A. On other projects , that was the normal thing to do.

202

1 O. Yes.

Did you ever query why on the Grenfell project therewas no such design responsibility matrix?

- $\begin{array}{lll} 4 & \text{A.} & \text{I think because of my limited involvement, I didn't get} \\ 5 & & \text{involved to that extent.} \end{array}$
- 6 Q. So does it follow that you didn't think it was unusual 7 that no such design responsibility matrix had been

8 established on the project?

- 9 A. On other projects they had been established. I'm not 10 sure if they'd become the norm as they are now.
- Q. To your knowledge, did anyone at Harley ever suggestthat such a matrix might be helpful on the project?
- 13 A. No.
- Q. Do you think such a matrix would have been helpful onthe project?
- 16 A. From looking back at it now, yes, it would.

17 Q. Yes.

Now, I'm going to ask you some questions about the
ACM in a moment, but before we get to that, I just want
to look at what you say at paragraph 26 of your witness
statement about the design process more generally. This
is at {HAR00010149/6}, and I want to look at
paragraph 26.

So if we can read what you say there, you say:

"There is a hierarchy in construction design where

203

the senior design team consisting of the architects,
consultants (fire, acoustic and structural) and
Building Control sit at the top. The main contractor
sits under this and the subcontractor designers sit at
the bottom. The senior design team are seen as the
experts and therefore their opinion is always deferred
to by everyone sitting below them."

Do you see that there?

9 A. Yes.

8

- Q. Now, would you agree that Harley had a responsibility to
   consider the viability of the design regardless of any
   perceived hierarchy?
- A. I think Harley could only comment on and, you know,
  perceive the viability of the design on the areas that
  they were expected to be experts in, which was the
  fabrication and installation parts. That's where their
  expertise lied. You know, points such as, you know,
  performances were not, you know, certainly at that time,
- 19 without a technical manager, where their expertise lied.
- Q. Do you agree in terms of fire performance that Harley
   could reasonably be expected to provide design input on
   a project like Grenfell?
- 23 A. I don't see how they could without that expertise.
- Q. Do you accept that when it came to specialist design
   input in relation to the façade, Harley were not sitting

1 at the bottom of the hierarchy; when it came to the 2 façade, as specialists, Harley were actually higher up 3 that hierarchy than you've portrayed in that paragraph? 4 Only on the points of installation and fabrication. 5 Q. You go on to say in the next main paragraph, third line 6 down, at the top of page 7 {HAR00010149/7}, so if we go 7 over the page, within paragraph 27, you say this, third 8 line down there: 9 "As far as I was aware the materials were all 10 compliant as they had all been selected and specified by 11 architects and the specification and drawings had been 12 reviewed and approved by a fire consultant and 13 Building Control. I am not aware of anyone raising any 14 issue or concern about the materials being used at any 15 stage ." 16 Now, we've done a lot, and I don't want to go over 17 it again, about whether it had been selected and 18 specified by the architects, but I want to ask you a bit 19 about the fire consultant. You say: 20 "... and drawings had been reviewed and approved by 21 a fire consultant ..." 22 Do you see that there? 23 24 Which fire consultant are you referring to? 25 A. If I'm talking about my knowledge then, I would have

205

1 just known that there was a fire consultant on the 2 project. Looking back at it now, I would say that was

3

- 4 Q. Yes. So you wouldn't have known at the time that it was
- 5 Exova?
- 6 A. No, I wasn't involved enough with the project.
- 7 Q. So would you agree that, at the time, you wouldn't have
- 8 known that the architect 's drawings and the
- 9 specification had been approved by a fire consultant?
- 10 A. No, I would have expected that to have been done at what 11 was referred to as the stage 4 design.
- 12 Q. Did you ever seek any assurances that a fire consultant 13
- had reviewed the drawings?
- A. No, but if I'd been the designer on the project, it's 14
- 15 what I would have done.
- 16 Q. Would it be fair to say that you did not take any
- 17 positive steps to confirm that a fire consultant had
- 18 approved the drawings?
- 19 A. It's fair to say that, but it wasn't my position to do
- 20
- 21 Q. Were you ever under the impression that it was Harley's
- 22 responsibility to establish a fire strategy for the
- 23 cladding design?
- 24 A. No, I would have assumed that that was done before the

206

25 stage 4 design by the architect.

- Q. That was something Mr Sounes said in his statement --
- 2 that's the transcript at {Day12/168:9} -- that it was
- 3 Harley's responsibility to establish a fire strategy for
- 4 the cladding design. You don't agree with that; is that 5
- 6 A. No, I think it goes back to what you said about having 7 a design matrix.
- 8 MS GRANGE: Now, I want to ask you some questions about the 9 ACM.

10 Mr Chairman, I won't finish this topic today, but if 11 you're happy to sit until 4.30, I would like to keep 12 going for now.

13 SIR MARTIN MOORE-BICK: Yes, all right.

14 MS GRANGE: Thank you.

15 Can we start by looking at the design team meeting 16 minutes on 13 August 2014. This is at {RYD00016885}. 17 So this is the design team meeting number 1 on 18 13 August 2014, and we can see that you are present 19 there at the bottom of the first column of lists of

20 names, Dan Anketell-Jones and Kevin Lamb, we see that

21

1

2

3

4

5

6

7

8

9

10

11

14

15

16

22 A. Yes.

23 If we go to section 7 on page 5 {RYD00016885/5} and read

24 at the bottom at 7.01, we can see it says:

25 "Planning.

207

"An overview of the Planning Application and discharge was given by BC & SL to bring everyone up to speed."

So that would be Simon Lawrence and -- I don't know who BC is there.

"Following several months of discussions, mock-ups and negotiations the final material submission was forwarded to Planners at the end of July. Forming sign off is anticipated 29/8/14. Our feelings are that the risk around planning sign off is now low as the design to date is now in line with the Planners requests.

12 "SL confirmed that we are to proceed [to] design 13 based on the following criteria.

> ·" Champagne coloured Cladding panels for the main part of the building ..."

Do you see that there?

17

18 Q. . Rainscreen cladding to be cassette (hidden fixing) 19 type."

20 And then he goes on about other aspects of it.

21 Was it your understanding by this point -- so

22 I think this is the first design team meeting and you're

23 there -- the decision had been taken to use the

24 Reynobond rainscreen cladding panels?

25 A. Yes.

- 1 Q. Did you understand at the time that the product was individuals at CEP, including Geof Blades. 2 2 formed of two thin sheets of aluminium with a low 3 density polyethylene, PE, core? Did you understand that 3 A. No. 4 4 at the time? O. Did you know her? 5 A. I understood that it had a core but I didn't understand 5 No, never spoken to her. 6 6 what it was. 7 7 O. Can you explain why you weren't interested in the core? 8 8 Why was that not something you wanted to know as the particularly. 9 9 design manager for this project, what was in the core of 10 the main rainscreen panels? 10 11 A. I think for this project I was only responsible for 11 but what she says is: 12 making sure that Kevin got started and then to make sure 12 13 13 he got on according to programme. In respect of other 14 14 projects, I would usually submit all that information to 15 15 Building Control and the architect to get signed off. 16 16 SIR MARTIN MOORE-BICK: Can I just ask, from a structural 17 point of view, you would need to know the weight of the 17 18 panels, wouldn't you? 18 19 19 A. Yes. 20 20 SIR MARTIN MOORE-BICK: And therefore possibly their 21 21 composition? 22 22 A. That's usually specified as an overall weight per metre 23 23 24 24 MS GRANGE: Now, I've asked you a little bit about your 25 25 knowledge of other cladding fires, and I think you've 209 211 1 1 said that you didn't have much knowledge at the time of 2 2 cladding fires, whether domestic or international; is 3 3 that correct? 4

  - 4 A. That's correct.
  - 5 Q. So were you not aware at this time that there had been
  - 6 cladding fires abroad on buildings containing
  - 7 polyethylene, PE, cored panels?
  - 8 A. No.
  - 9 Q. If you had been asked, "What is the core made of?",
- 10 would you have been able to give an answer?
- 11 A. No.
- 12 So you didn't understand that there was polyethylene in
- 13 the core?
- 14 A. Not that I can remember, no.
- 15 Q. Had you been told that it was polyethylene, would you
- 16 have had any concerns in terms of fire performance with
- 17 a polyethylene core?
- 18 A. At that point I don't think it would have jumped out.
- 19 I think that I'd worked on projects previously where the
- 20 same products had been signed off, and if it had been
- 21 signed off by Building Control there, I thought it would
- 22 be okay anywhere else.
- 23 Q. Can we turn up an email. This is {CEP00049719}. If we
- 24 can blow that up and the top half of that page. This is
- 25 an email from Deborah French of Alcoa on 13 May 2013 to 210

- Did you know Deborah French at Alcoa?
- Q. What about Geof Blades at CEP? Did you know him?
- A. Knew of him; I'm not sure that I ever spoke to him
- Q. Now, just to be clear, you're not copied in to this email, I'm not saying you knew about this at the time,

"As you may be aware there had been some reports via BBC concerning a fire on a building in UAE regarding

"As a business we are aware of this report and our technical team are following the details, but in the meantime I wanted to add some thoughts that may help if you get questions from your customers/clients etc.

"Regarding the supply of Reynobond in the UK, as you know we supply both PE and FR core and can control and understand what core is being used in all projects due to the controlled supply route we have. By only supplying Reynobond to a very small group of Approved Fabricators and working very closely with them on all

projects we are able to follow what type of project is being designed/developed and then offer the right

Reynobond specification including the core.

"At this stage we will continue to offer both PE& FR core and continue the close working relationship we have with our Approved Fabricators to make sure the right technical support ..."

8 Et cetera, et cetera. Do you see that there?

9 A. Yes.

5

6

7

10 Q. Were you ever made aware of this email or the substance 11 of what's in this email?

12 A.

13 Q. Were you aware of fires in the UAE involving ACM in or 14 around May 2013?

15 A. No, I think the first time that I learnt about those was 16 when I was doing the course at Bath.

17 Q. Right. So you were never made aware before that of the 18 contents of this email, ie that there were concerns in

19 the industry arising out of these fires in 2013?

20 A. No.

21 Q. Were you aware that Reynobond ACM could be supplied with 22 either a PE or an FR core?

23 No, again, I think that was something that I didn't

24 learn about until I was at Bath.

25 So you weren't aware at the time of the Grenfell project 212

1	that there was an FR core to the Reynobond, a fire	1	INDEX
2	retardant, fire resistant core?	2	MR DANIEL ANKETELL-JONES (continued)1
3	A. Not that I can remember, no.	3	Questions from COUNSEL TO THE INQUIRY
4	Q. So you didn't ever have any discussions with anybody at		(continued)
5	Alcoa or CEP about whether a PE or FR core should be	4	
6	used on the Grenfell project?	5	
7	A. No, I think I had virtually no communications with CEP	6	
8	or Alcoa.	7	
9	MS GRANGE: Mr Chairman, I think that's probably	8	
10	an appropriate moment, because there's a little bit to	9	
11	go on this topic.	10	
12	SIR MARTIN MOORE-BICK: Right.	11	
13	MS GRANGE: So I will need to ask this witness to come back	12	
14	tomorrow morning.	13	
15	SIR MARTIN MOORE-BICK: Well, you did indicate that. Can	14	
16	you give me some idea of how long you might require him?	15	
17	MS GRANGE: I would hope to be about an hour in the morning	16	
18	with him.	17	
19	SIR MARTIN MOORE-BICK: Right.	18	
20	Well, Mr Anketell-Jones, I'm sorry that we've not	19	
21	been able to finish your evidence today, and I'm sure	20	
22	you would have liked to have got away, but I'm afraid	21	
23	I'm going to have to ask you to come back tomorrow for	22	
24	a few more questions.	23	
25	Judging by what Ms Grange has said, I think you can	24	
	213	25	
1	hope to get away between 11.00 and 11.30, if that		215
2	affects your arrangements.		
3	But we're going to break now, so I'll ask you to be		216
4	back here at 10 o'clock to start again in the morning,		
5	and please not to talk to anyone about your evidence		
6	over the break. All right?		
7	THE WITNESS: Yes, sir.		
8	SIR MARTIN MOORE-BICK: Thank you very much. Would you like		
9	to go with the usher, please.		
10	(Pause)		
11	Right, Ms Grange, 10 o'clock tomorrow morning.		
12	MS GRANGE: Yes, thank you.		
13	SIR MARTIN MOORE-BICK: Thank you very much.		
14			
15	(4.30 pm) (The hearing adjourned until 10 am		
	• •		
16 17	on Wednesday, 16 September 2020)		
18			
19			
20 21			
22			
23			
$_{\Delta}$			

214

able (42) 9:15 14:13 26:19.22 38:14 55:15 63:14 65:18 69:6 71:3 78:13 83:16 86:8 112:4,12 123:18 126:6.25 132:15.20 133:13,17 135:14 138:25 140:2,4 143:21 144.9 145.10 19 153:9,21 157:9 162:3 178:9 179:15,16 184:25 198:16 210:10 212:1 213:21 abnormal (1) 153:11 above (34) 38:9 70:17 75:9 79:16,21,24 80:8,14 83:13 84:4 87:19 88:3 89:24 90:6,8 91:1,9 95:8,14 97:14 102:5.15 134:6,11 139:17 143:9.20 146:24 154:4 160:20 162:19 169:19 180:22 193:1 abroad (1) 210:6 academy (1) 168:24 accept (7) 36:3,12 114:24 129:16 172:23 177:5 204:24 acceptable (9) 75:9 90:25 91:9 95:14 115:24 134:6,12 163:3 accepted (4) 64:12 129:1,2 137:15 accepting (1) 115:6 accordance (2) 100:12 200:12 according (1) 209:13 account (1) 51:4 accurate (3) 95:1 174:12 175:18 achieve (3) 25:4 118:24 125:20 achieved (7) 87:14 92:8 104:14 118:24 122:25 134:4 181:9 achieves (1) 92:1 achieving (1) 154:6 acm (17) 23:22 24:4 25:5 27:1.4.10 36:10 82.12 103.8 114:6,9,13 203:19 207:9 211:15 212:13,21 acoustic (1) 204:2 across (6) 6:14 29:4 67:23 84:22 138:3 182:23 action (3) 29:23 31:6 actions (1) 31:5 actual (2) 42:21 164:13 actually (22) 11:20 24:20 26:24 39:7 49:21 53:8 56:17 67:6.21 76:9 77:13 80:18 104:14.19 112:23 132:20 146:6 150:9 163:8 188:9

adb (2) 91:16 129:18 201:16,22 204:10,20 add (3) 156:20 157:21 206:7 207:4 agreed (5) 14:5 33:4 54:7 118:7 162:1 ah (1) 2:11 additional (5) 46:13 ahead (2) 33:12 192:11 alarm (1) 144:13 albiston (7) 23:16 25:23 address (2) 51:25 81:25 29:16 31:12 174:21 addressed (6) 32:18,20 177:15 178:4 169:8 194:20.24 197:8 albistons (1) 177:18 addressing (3) 187:1,24 alcoa (4) 210:25 211:2 213:5.8 aldridge (1) 168:23 align (1) 137:21 adjourned (1) 214:15 aligned (2) 77:12 adjournment (1) 120:18 182:20 adjusted (1) 197:10 alliance (1) 146:15 allow (2) 54:2 179:13 adopted (2) 28:3 193:18 allowed (6) 103:23 advance (2) 49:13 50:11 134:20,24 135:6,12,16 advice (11) 19:8 90:15 almost (4) 42:16 136:15 168:24 184:23 along (3) 130:3,7 164:21 170:1 172:3 178.15 advise (2) 26:22 41:14 already (21) 48:13 99:18 102:16.19 adviser (2) 140:11 144:7 116:17 124:11 125:5,14 127:4 131:8 141:3,11,13 142:1 146:9.14 149:19 afraid (3) 88:15 148:18 155:11 171:2,11 172:7 also (20) 2:7 3:16 after (23) 8:18 14:15 7:5.22 38:9 49:4 67:7 15:18 22:2,3 61:16 70:3 76:20 85:4,7 63:15 70:11 84:15 98:25 100:8 122:23 88:14 105:19 146:6 163:10 172:20 175:1 149:10 160:7 162:25 177:20 181:2 190:6 164:16 165:17 172:5 alternative (6) 60:10 82:16,21 91:15,20 148:5 afternoon (1) 53:16 alternatively (1) 175:6 afterwards (2) 13:15 alternatives (5) 36:11 59:9,16 60:17 61:3 although (3) 32:17 9:6,22 10:2,23 11:7 169:15 194:19 alucobond (1) 60:12 29:13 40:9 70:7 75:4 aluminium (5) 12:11 84:12,18,24 85:12 70:1 96:25 200:20 209:2 always (31) 9:9 10:11 98:2,10,20,25 99:17 100:20 101:7 105:23 11:11 16:17 17:20 120:10 126:24 132:22 19:11.12 24:7 50:19 147:6 164:14 168:14 62:7 65:14 72:18,25 172:10 178:6 190:7 76:7 84:18 85:12,15 192.7 193.4 11 194.3 87.5 113.8 116.6 137:19 152:5 154:7 198:4,12,23 205:17 162:16 164:12 168:10 193:22 194:3,7 198:17 against (4) 40:22 81:15 204:6 amended (1) 197:22 amending (1) 181:2 amendments (2) 193:23 194:4 agree (38) 15:3 32:20 analyse (2) 61:11 62:22 38:20,23 39:1,6 41:22 analysed (1) 63:19 analysis (3) 21:10 65:9 71:6 111:14,19 115:22 158:10 130:8 132:1 137:5,22 angles (3) 179:13 180:9

211:18

addition (3) 60:7

139:24 140:8

126:20 131:19

197:12.17

198:22

56:7,9

adequate (3) 42:7

adopt (1) 27:24

102:25 103:4,11

affected (1) 92:23

aforementioned (1)

affects (1) 214:2

173:20 177:8

183:10

189:10.23 191:9

again (50) 7:9 8:4

24:17 26:13 28:6

87:12 92:15 95:18

195:19 197:8

212:23 214:4

119:15.22

agf (1) 200:20

agm (2) 2:5 3:6

ago (2) 97:3 117:1

46:11 54:11 60:25

147-23 153-8 155-18

157:1,5 164:21,24

168:2 169:6 178:4

179:4,23 181:15 194:5

182.20

anketelljones (23)

1:5,7,8,16 2:23 3:13

41:12 57:5,17 102:2

138:19 190:12,13

applies (1) 98:12

52:6

213:22

161:23 162:10,18

118:2 120:8,20 161:4 162:20 173:14 177:21,21 178:16,20 207:20 213:20 215:2 annotated (2) 38:6 195:9 annotation (1) 188:15 annotations (2) 37:22 38:16 another (36) 37:17 42:6.24 44:25 46:17 47:7 53:5 59:19,22 61:6 63:24 64:14.22 93:15 95:22 97:24 98:1 105:18 109:9 119:1 126:13 129:3 138:10,10 144:21 150:7 163:7 165:10 167:10 173:10 177:1 179:7 194:9 195:23 196:12,22 ansic (1) 92:1 answer (15) 60:21 63:1,3,5 64:7,20,24 86.2 103.21 138.5 156:8 165:10,11 172:12 210:10 answered (2) 31:13 127:6 answers (3) 1:18 26:9 98.4 anticipate (1) 130:4 anticipated (2) 113:5 208-9 anticipating (1) 112:18 anybody (12) 45:23 62:2,12,22 64:10 73:3 93:1 142:3 149:4 167:4 202:3 213:4 anyone (28) 17:2 27:21 34:7.12.17.17 42:21 56:17 57:6 71:14 72:5,20,21 74:1 78:16 81:6 88:13 101:12,18 114:11 119:25 120:11 171:14 173:18 202:1 203:11 205:13 214:5 anything (15) 14:2 57:7 63:13 71:23 85:14 87:15 89:2 91:19.20 97:5 99:19 112:8 120:12 146:2 202:5 anyway (3) 122:22 128:11,15 anywhere (1) 210:22 apart (1) 169:22 appear (8) 4:1 23:6 40:25 47:13 126:19 147:6 148:25 197:16 appeared (3) 4:10 162:4 198:9 appears (11) 6:24 10:19 32:20 49:17 105:20 147:23 153:3 172:24 190:15,16 198:4 appease (4) 135:24 136:4,9 137:8 application (4) 98:17 100:24 115:20 208:1 applications (1) 128:25 applied (4) 100:6

apply (3) 69:7 100:2 191:4 applying (2) 15:17 191:8 appoint (2) 40:1 41:14 appointed (6) 20:13 22:11 42:12,13,20 47:2 appointment (8) 23:10 36:7 39:17 48:2,5 74:18 84:15 177:8 appreciate (3) 130:21 132:23 175:16 approach (2) 45:16 198:13 appropriate (9) 56:24 105:21 114:20 119:3 143:19 149:17 154:4 176:19 213:10 approval (12) 72:3 73:18 132:19 154:8 178:21 183:19 187:16 188:8 193:19,23 194:4,16 approvals (1) 196:10 approve (9) 72:3 105:3.6.8 126:7 138:15,16 187:10 192:21 approved (27) 21:4 30:3 65:15 136:6 141:3 142:1 162:14 171:2,12 185:20 186:15 190:8.16 191:1.5.9 192:10 194:7 198:15 199:11.15 205:12.20 206:9,18 211:24 212:6 approving (8) 176:5 185:2 186:5,11 188:4 192:17,19 198:18 approximate (1) 201:20 approximately (2) april (5) 24:18,19 25:24 146:16.17 architect (49) 17:21 24:8.16 28:18.25 34:25 35:11 51:15 59:1 62:8 66:2,8 71:22 80:1 85:17 94:11 97:23 101:23 102:12 105:10,12,15 116:7 117:23 119:5 124:5.14 131:8 139:10 141:4 146:10 154:8 160:6 171.2 176.12 180.4 188:5,6 189:23 191:10,18,22 192:22 194:2,7 198:18 199:16 206:25 209:15 architects (10) 73:21 93:2 107:22 137:24,25 188:25 204:1 205:11,18 206:8 architectural (1) 34:14 area (4) 82:14 94:3 127:20 156:17 areas (5) 26:18 127:12 156:11 158:24 204:14 arent (5) 6:10 7:9 74:21 126:14 152:21 argue (1) 72:10 arising (2) 23:2 212:19

arose (1) 174:7 around (12) 48:10 51:18 53:5 54:1,19 75:11 84:15 109:24 169:22 171:7 208:10 212:14 arrangement (1) 183:24 arrangements (1) 214:2 arrived (1) 117:21 art00001487 (1) 22:14 ascertain (1) 133:15 ashton (13) 158:17 159:8 160:8,12,13 161:19 162:4.9 165:12 167:22 168:13 169:11 170:1 ashtons (2) 167:11.12 ask (36) 1:5 2:18 17:5 19:6 36:18 37:16 39:16 40:10 57:23 67:9 90:14 102:21 122:9 130:15,16 133:5 140:9 143:3.5 144:1 150:17 153:22 154:21 155:25 163:6 175:16.25 185:1 198:8 203:18 205:18 207:8 209:16 213:13.23 214:3 asked (29) 1:20 7:7 12:5 45:23 50:17 78:16 82:13 86:7 102:23 122:14 123:10 124:9.21 130:23 131:2 138:19 145:13.22 150:16 152:8,10 157:7.8.14 165:15 167:13 170:19 209:24 210:9 asking (21) 16:25 18:19,23 26:25 82:20 101:19 117:20 124:3 126:19 128:16.20 130:10 138:4 144:6,18 165:9,10,22 166:7,15 171.20 asks (1) 25:9 aspects (2) 94:2 208:20 assembly (2) 178:19 179:1 assess (2) 51:16 65:18 assessment (10) 27:9 101:19 115:18 116:2,4 141:8 145:18.19 170:24 193:18 assessments (1) 21:11 assigned (1) 106:5 assistance (1) 28:12 associated (4) 51:13,18 61:15 101:3 assume (2) 38:17 130:2 assumed (9) 27:15 34:24 55:11 135:5 142:19 162:11 164:4 191:24 206:24 assuming (2) 86:3 191:15 assumption (4) 39:6 118:5 129:24 185:9 assurance (1) 115:12 assurances (1) 206:12 attached (32) 13:6 25:3

146:23 155:9 156:2 158:25 163:10 174:24 180:15 182:8 184:5 187:8.21 192:11 194:15 195:3 196:2.19 197:19 198:5,10,24 199:22 200:11,25 attaches (3) 29:8 188:14 196:22 attaching (3) 24:24 80:19 164:9 attachment (5) 163:15.19.20 195:7 197:20 attachments (5) 28:15 86:15 199:4.23 200:15 attend (3) 2:5 45:13 179:15 attendance (1) 49:15 attended (6) 1:21 7:20 12:25 49:11 63:15 116:19 attendees (1) 13:6 attending (3) 13:3 14-15 15-9 attention (7) 51:24 68:19 103:22 104:2,7,9 152:23 attitude (1) 135:11 aug14pdf (1) 163:16 august (32) 32:11,13 34:1 39:22 48:10 49:12.22 52:1 53:6.10 74:17.22 83:20 84:12,14,16 93:16 98:2 100:10 105:18.20 106:2 107:20 116:19,21 127:5 172:18 178:20 183:21 197:22 207:16,18 author (1) 38:2 authorise (1) 173:5 authority (2) 88:24 155:20 autocad (3) 30:1 31:2,6 availability (1) 109:14 available (4) 39:23 40:16 66:25 107:23 aware (115) 8:4,12 9:4.13 10:3.4 11:8.14 12:5,8,10 15:5 18:20 19:7 20:24 21:23 24:12.13 27:4.6 36:14 38:12 40:24 44:13,15 45:1 59:12,17,18,21 60:15 19 22 61:19 63:22,23 67:12 69:2,18 71:14 73:8,11 75:18 78:8,12,22,24 79:19 84:2,6,9,11 86:4 87:16 88:23.24 89:10 93:6,9 96:19,21 98:21 102:6.8 107:20 109:6 113:14,16 114:14 115:3,9,21,25 116:4,5 121:12 128:1,22 129:1,12,15,16,17,20 137:13 141:8,13 146:9 148:9,23,24 149:8 153:12 14 17 154:2,13,19 159:22 164:4 176:7 185:12

196:15 205:2

190:23,25 191:3

28:14 33:2,8 43:11

85:7 139:23 140:6

205:9,13 210:5 211:13.16 212:10,13,17,21,25 awareness (4) 21:6 35:8.10 75:19 away (6) 13:25 42:16 44:5 139:13 213:22 214:1

В b (15) 35:19 162:14 166:1 188:25 189:2,13,21 191:7,15 192:1 195:9,19,21 197:21 200:2 bachellier (1) 174:21 back (116) 1:6 4:4 7:17 8:9 10:2,14 12:23 13:20 14:18,22 16:18 24 17:2,4,8,10,16,20 19:13.22 20:16 22:18 25:22 26:15 28:12 36:8 40:9 42:25 47:13 51:19 57:5 60:21 66:16 70:5,24 72:3,19 73:6,13 78:13,21 83:10,14,23 84:12 86:8 90:18,19 91:21 92:24 97:10 99:17 100:20 102:9 104:5 113:9 120:13 124:10.24 125:4 126:5,19 127:12 128:3,5 134:21 137:3 139:13 142:14 143:15 144:23,25 145:3.23.24.25 146:16 150:9 155:19 158:14 159:24 162:16.19 164:14 165:10.12.23.25 166:12,15,24 167:8.11.22 168:7 171.5 17 20 173.15 180:4 183:3 185:15 186:4.24 187:17 189:25 194:2 198:4 202:6,9 203:16 206:2 207:6 213:13,23 214:4 backup (4) 135:24 136:3,9 137:7 bailey (16) 23:16 43:5 45:7 49:11 56:22 62:20 63:8 152:24 153:22 178:16 183:22,22 186:22 200:20,24 201:9 baileys (5) 16:6 62:16 63:24 102:21 116:1 barely (1) 10:4 barrier (6) 160:18 161:8,22 163:2 164:18

basic (1) 72:22 basically (3) 5:25 34:2 126:3 basics (2) 127:21 128:12 basingstoke (1) 7:4 basis (6) 5:10 28:3 110:8 129:3 166:4 bath (4) 8:14 68:1 212:16.24 bbc (1) 211:14 bc (2) 208:2.5 bearing (1) 38:18 became (5) 15:25 27:18 67:25 69:2 177:12 become (7) 8:12 21:23 56:5 104:21.24 182:8 203:10 becoming (1) 132:4 before (47) 10:9 37:16 42:11.19.21 44:4 45:24 48:18 49:23 68:2 71:3 74:10,11,17 75.18 77:10,10,11,19,23 83:20 86:7 88:10 99:9,11 130:17 133:23 134:1 141:14,21 166:21 167:1,5 169:2 172:16 173:2 175:18.20 182:21 185:22 190:17 191:2 198:10 201:23 203:19 206:24 212:17 beforehand (2) 28:4 201:19 beg (1) 151:10 began (1) 65:1 beginning (8) 13:9 16:7.9 20:10 53:11 55:8 61:5 123:13 begins (4) 58:14 59:4 96:12 155:2 behind (5) 9:14 82:12 136:13 160:16 161:20 being (67) 5:5 14:11 17:8 22:11,25 23:9 27:6 31:17 38:21 39:11 41:1 47:18 50:4,6 65:6 69:3,10 71:11 72:18 73:20 76:9 78:24 86:22 87:19 91:6,10 92:22 93:7 95:20 98:21 102-14 112-12 115-9 117:14 122:14 123:10,16,24 124:8,21 129:25 130:23.23 131:2 137:18,20 138:18 139:7 143:25 147:3,22 148:14,16 151:22 152:7 154:4 157:7 167:13 176:21 178:25 183:25 191:1 194:19,20 205:14

164:17 165:18 170:4 believed (9) 51:8,9 72:10 93:13 94:2 101:24 125:23 164:6 165:2 bells (1) 144:13 below (21) 29:18 43:11 46:8 52:5 60:7 82:10,13 90:14 96:5 99-1 121-9 151-16 161:8 163:1 164:17 165:18 168:21 169:11 171:18,23 204:7 ben (12) 45:13 74:16 75:2.3 108:25 109:1 152:24 183:22 186:22 200:20.24 201:9 benefit (1) 133:25 bennett (5) 81:24 82:3,25 83:10 84:2 berry (1) 151:24 bespoke (2) 48:7 52:13 best (2) 201:16,21 better (3) 45:20 172:9 188:20 between (17) 16:11 29:22 36:25 71:11 78:17 85:11 110:6,6 113:10 128:20 149:9.12 156:18 167:25 172:18 178:10 214:1 bit (16) 20:16 42:24 75:25 77:15 83:1 166:2 173:16 176:2 182:8,16 189:1,12 192:4 205:18 209:24 213:10 black (1) 137:19 blades (2) 211:1.6 blank (3) 2:12,16,17 bleep (1) 43:18 blips (1) 2:23 blow (8) 12:19 23:14 28:8 36:20 41:7 53:7 110:15 210:24 board (7) 42:15 75:6 89:6,24 90:19 138:3 170:6 body (2) 124:1 194:20 boss (1) 150:25 both (6) 25:13 46:1 142:18 178:15 211:21 212:4 bottom (64) 3:11.12.19 7:5,6 8:21 9:1 10:20 11:1,5,18,24 23:18 24:21 25:10 35:21 40:10 43:3,3 44:4 53:8.11 60:4 69:12.12 81:23 83:7,9 96:6 109:10.10 119:10 122:3,3 135:18 144:22 151:16 155:1,1 159:7 160:9,11,21 161:2 166:7 167:13,18,20 169:21 180:14 186:17,19,25 187:3 190.7 9 194.11 195.23 197:23 199:10 204:5 205:1 207:19,24 bought (1) 42:9

156:16 159:1 163:1

box (1) 11:21 boxes (1) 89:21 br (14) 4:11 8:24 10:25 11:5,8,10,14 75:7 90:24 95:13.21 98:10 100:12 168:5 bracketry (2) 6:7,9 brand (1) 107:7 bre (3) 4:6 86:20 100:8 break (12) 56:25 57:4.15 119:9 120:9,12 173:10.12.14.25 214:3,6 brief (2) 58:11 59:3 briefly (3) 22:10 58:23 122:8 brigade (1) 9:10 bright (2) 76:21 78:23 bring (6) 4:14 40:3 48:3 100:20 185:24 208:2 bringing (2) 7:17 10:2 broadly (2) 26:22 137:13 brochure (1) 91:8 brochures (5) 76:21 78:23 87:8.10.11 brother (1) 41:13 brought (4) 42:18 68:19 185:22 202:11 bruce (7) 23:16 30:1,3 31:2 32:15 155:5 186:21 bs (10) 4:11 10:17 90:24 95:11,21 96:7 122:17 126:1 131:14 142:9 bs476 (3) 122:24 140:2,7 bs8414 (1) 140:8 bs84142 (1) 139:23 bubbles (1) 195:12 budget (3) 25:14 81:9,12 build (2) 23:25 71:24 builddesk (3) 106:14,20 118:13 building (75) 6:16 7:2 16:16 17:22,24,25 18:1.4.8.11.12 34:10 35:1,12 51:12,15,17 61:15,25 62:1,9 65:16 66:2.3.9 67:3 69:6.8 71:22,24 73:18 80:5 81:11 83:3,9,11 88:24 90.11 94.11 21 95.8 97:15,22,23 103:12 105:10,13,16 116:8 123:14 124:14 129:9 131:9,11 138:1 141:4 146:10.15.23 148:20 154:8 160:22 162:11 167:18.20 169:3 171:3 180:5,6 204:3 205:13 208:15 209:15 210:21 211:14 buildings (19) 75:9 76:20 79:5,12,16,24 80:8 87:19 88:3 90.8 25 91.9 13 95.14

bullet (4) 29:24 59:6 66:23 70:12 burn (3) 11:25 169:16 170:12 business (5) 16:21 50:23 73:4 152:13 211:16 busy (1) 42:5 c (2) 25:16 35:19 c1059 (3) 199:4,24 200:15 calcs (1) 181:25 calculate (2) 106:22 107:18 calculated (3) 106:8 107:2.9 calculation (1) 133:11 calculations (4) 75:13 133:13 182:15,20 calculator (1) 90:1 call (12) 32:22 33:4,12,14 85:13 called (9) 4:16 49:25 78:14 106:5,20,23 145:23 150:22 199:4 came (21) 13:24 22:1 36:22 42:15 47:24 89:15 107:12 108:14 111:8 113:20 115:23 126:19 129:8 153:19 154:23 204:24 205:1 cant (65) 1:25 2:17.18.19 5:4.11.16 7:14 8:10 14:2,8,11 15:2.11 17:4 47:10 76:2,4 77:13 79:17 80:24 86:1.3 87:1 88:18 92:6,14 95:19 101:16 106:24 113:12 114:2 127:19 130:6 135:22 138:14.16 139:1.9 141:22 147:11 157:8 161:18 165:6 170:4.16.22 171:25 201:7 capability (1) 51:16 185:24 202:16 58:20 capitals (1) 13:14 career (2) 26:17 167:2 careful (1) 171:6 carried (7) 102:1 120:3 122:17 131:8.12 166:25 176:8 103:19,23 139:17 carry (6) 1:10 10:21 143:20 210:6 55:15 57:18 133:13 buildup (2) 114:3

174:2

139:24 bulldesk (1) 106:12 buying (2) 151:5 153:10 137:21 140:12 144:25 145:2,24 147:6 182:9 calling (2) 85:15 145:25 51:23 71:2 76:10 81:2 cannot (2) 76:18 98:15 50.9 67.25 68.1 70.24 108:9,12 110:10 112:8 172:2,3 177:13 182:9 190:2,5 193:17 194:25 capable (4) 51:9 154:6 capacity (3) 40:2 46:14

carrying (1) 77:25 casings (2) 25:7 169:22 cassette (1) 208:18 cassettes (1) 53:25 cast (2) 8:9 14:13 catch (2) 92:10 181:25 catchup (1) 109:24 categorised (1) 21:7 category (10) 189:4,13,17,21 190:4.23 191:10,13,15,15 cause (4) 131:4 143:12 170:20 182:25 caused (1) 170:23 causing (1) 143:17 caveat (1) 98:21 cavities (2) 160:16 161:20 cavity (16) 103:5,6 155:5 160:18,21 161:22 162:6 167:17,20,23 168:22,25 169:21 170:5 171:19.24 cced (2) 31:12 169:6 ccing (10) 29:16 53:14 82:5 83:1 162:21 168:14 174:21 181:4 192:7 194:12 cdm (9) 20:19 21:1,2,8,11,16,20,24 22:7 ceiling (1) 169:1 cel00000009 (1) 88:22 cel00000011 (1) 100:9 cel000000112 (1) 100:16 cel000000114 (1) 100:23 cel00000012 (1) 98:1 cel000000123 (1) 98:7 cel000000124 (1) 98:23 cel00000013 (1) 93:17 cel000000135 (1) 94:15 cel00000014 (1) 109:9 cel00000018 (1) 110:15 cel000000191 (1) 139:20 cel000000192 (1) 122:2 cel00000023 (1) 144:22 cel00000035 (1) 152:17 cel00001037 (1) 2:8 cel00001038 (1) 4:14 cel000010382 (1) 7:1 cel000010383 (1) 7:22 cel000010384 (1) 9:18 cel000010385 (1) 10:17 cel000010386 (2) 10:23 11:19 cel000010387 (1) 11:1 cel00001237 (1) 74:15 cel00001255 (1) 12:18 cel00001451 (1) 105:22 cel000031191 (1) 83:7 cel000031192 (1) 82:22 cel000031193 (1) 81:22 cel00003628 (1) 146:17 cel00008582 (1) 150:7 cel00009974 (1) 121:3

cel00011960 (1) 84:13

celotex (110) 2:7 3:22

4:1 12:18,22 69:13,25

70:18,23 71:6 74:16 76:1.15.16.17.19.19.21.25 77:4,11 78:9,16,21 79:5.11 80:7 81:2.6.18 82:25 83:17.21.23 84:3,9 85:24 86:5,18 87:18 90:1,16,23 93:16 94:5,20 95:10 97:4,4,13,19 101:12 102:4 103:8,11,18,18 104.13 105.20 23 106:6,17,23,24 109:3.4 110:19 112:15,24 113:24 116:2 121:2.4.13.16.20.22 122:5 127:18,23 128:20.23 129:12 130:4.10.17 131:5 132:5 134:5 136:21 142:17 146:5 149:16.18.20 150:5 151:8,9 152:16 153:4,4,14,20 154:9.11 163:10.22 170:24 171:1 172:10 celotexs (2) 80:7 143:1 cement (2) 96:12,22 centre (2) 66:21 67:2 centres (3) 25:15,16,17 cep (4) 211:1,6 213:5,7 cep00049719 (1) 210:23 certain (8) 11:10 129:13 134:25 157:4 164:24 165:14 174:11 193:6 certificate (4) 64:9 86:19 88:22 122:23 certificates (2) 64:11 cetera (5) 22:17 126:12 127:8 212:8,8 chain (22) 43:1 81:21 82:3 84:23 144:21 154:25 155:1 158:14 159:17,23 161:4 162:18 163:9 167:8.24 168:12 172:21 187:17 193:11 195:1 197:24 201:2 chairman (5) 56:24 120:5 173:9 207:10 213:9 chalcots (2) 48:20 174:13 challenge (1) 72:9 champagne (2) 53:24 208:14 chance (3) 12:12 175:20 178:3 change (8) 71:7.11 108:2 135:23 139:2,4 179:12.12 changed (2) 77:14 85:17 changes (1) 97:14 changing (5) 108:5 113:15,16 137:4 149:14 channels (1) 25:16 check (45) 14:25

165:19

170:5

208:13

base (1) 23:24

based (9) 36:3 46:7

76:7 112:10 129:24

166:5 184:6 196:9

barriers (10) 18:22 19:2

103:5,7 155:6 157:3

162:6 164:23 165:2

211:22 212:2

belief (1) 194:6

believe (22) 8:7,8 10:9

29.4 31.24 42.21 72.4

94:12 99:21 101:24

105:3 114:17 116:11

118:7 149:11,13

16:20,25 18:12 19:20

28:1 34:8 35:2 53:1

62:10,24 63:9,14
72:22 76:1 79:15 80:4,16 95:23 98:16
101:18 106:23 108:17
117:5 118:8,15 120:2 124:25 129:5 134:19
143:23 152:6 162:13
166:25 167:4,4 175:17 176:21 177:1 179:24
180:15 184:16,19
190:22 191:18 checked (23) 51:15
52:14,20 63:10 66:1,2,9 79:23 80:3,13
91:24 94:11 102:11,16
108:21 118:4,11 119:14 146:4 172:8
175:12 185:6 190:20
checking (24) 34:13,14,19 35:4,9,12
56:3 62:4,13 66:7
98:16 116:6 118:20,23 119:19,22 179:21,25
182:12 184:18 186:10
188:3,8 202:14 checks (7) 18:2 28:4
62:8 131:8,11 168:23
186:1 chimney (3) 156:19
157:4,20
choice (4) 24:1 27:10 36:13 38:25
choose (1) 113:7
<b>chosen (3)</b> 93:11,12 113:8
chronology (3) 28:6
109:8 121:25 circumstances (4)
108:13 129:13 189:9,20
civil (1) 50:20
clad (1) 23:25 cladding (66) 7:23,25
8:2,5,13 10:18 15:4,5
16:15 24:14,25 25:5 27:3 33:8 58:15 59:14
60:7,9,22 62:24
66:19,22 67:2 68:21 69:22 70:2 75:8 78:25
81:18 86:20,21 87:17
90:17 93:17 96:16 97:25 115:18 122:19
123:2 126:12 127:7
131:24 132:15,25 133:25 134:9
156:11,18,19 157:5,21
158:8,24 160:17 161:21 163:15 169:22
197:12 206:23 207:4
208:14,18,24 209:25 210:2,6
claimed (1) 103:19
clarify (2) 29:22 143:3 clarity (1) 155:25
class (33) 64:9
92:2,9,10,12,17,22 93:1,7,11 94:20 95:2
103:18 122:24 131:17
140:8 162:25 164:16 165:17,25
166:10,14,19
169:14,16 170:10,11,13,21

171:6,7 172:11,23 80:20 106:7 184:6 classification (9) 95:1 185:15 189:4.11.17.23 191:12,15,19,22,24 100:11 101:1.3 164:22 193:13 194:2 195:3 classifications (5) 10:24 196:8 197:10.17.19 92:25 165:1,7 166:22 198:10 199:22 200:1,12 commercial (2) 41:19 clear (10) 22:14 54:15 63:19 148:3 149:3 commonly (1) 191:21 communications (2) 131:10 213:7 companies (3) 50:22.22 clearly (3) 166:7 195:21 77:14 company (10) 48:7 49:4 client (12) 16:18.19 52:22 73:7 18:11,13,14 20:25 77:12,18,21 121:14 55:10 125:22 128:20 123:15 151:14 comparative (1) 60:8 130:15 131:4 144:17 compare (1) 145:12 compared (1) 12:11 123:10 124:1 125:24 comparison (1) 86:19 competent (3) 49:2 close (2) 78:3 212:5 185:24 202:12 closely (4) 24:13 39:7 competing (1) 142:18 competition (2) 144:12 150:17 competitor (2) 143:1 150:24 complete (1) 182:17 colleagues (7) 12:22 completed (1) 193:13 13:20 14:18.21 24:9 completely (3) 137:4 164:4 177:12 coloured (1) 208:14 complex (1) 133:20 column (6) 25:6 95:9 complexity (1) 202:20 compliance (26) 14:7 17:1 28:2 31:23 32:9 columns (1) 156:17 34:9,15 61:13,24 colwell (3) 4:6,19 9:19 62:5,14 63:10,20 combination (1) 31:21 66:21 67:13 72:23 80:17 86:21 91:16.20 129:19 148:4 162:5 97:25 103:1 104:13 168:4,21 171:13,19,23 132:24 148:5 172:8 combustible (8) 160:17 compliant (10) 27:10 161:21 165:13,14,24 34:20 35:1 66:8 72:18 125:23 129:12,15 come (28) 1:6 10:14 172:6 205:10 20:16 50:3 57:5 67:23 complied (2) 16:15 75:10,22,24,25 77:4,6 62:24 81:1 112:11 113:9 complies (1) 18:6 124:4 126:5 134:2 components (7) 5:23 139:13 143:15 158:23 31:21 35:25 90:12 165:10.12.23 173:15 97:13.14 139:24 composite (2) 70:1 97:1 comfortable (1) 51:1 composition (1) 209:21 comprised (2) 64:18 coming (14) 2:9 28:18 78:10 47:22 83:14,23 85:19 conceivable (1) 168:25 concentrating (2) 110:8 112:4.13.19 113:4 132:8 149:13 5:14,17 concept (8) 9:12 12:10 commas (1) 137:12 35:24 36:6,17 102:16 178:19.25 26:20 33:8 38:9 107:1 concepts (1) 12:9 136:2 153:9 158:25 concern (11) 45:15 134:24 142:8,11,13 143:17 144:5,8 159:19 170:20 205:14

97:12 98:12,13,17

clause (1) 67:8

clauses (1) 60:8

169-2 19 189-12

193:22 211:9

199:8

cleared (1) 135:22

clients (7) 17:23

clip (1) 10:18

198:16 211:25

codes (1) 127:14

collapse (1) 11:25

26:15 150:16

97:9 98:8 169:22

combustibility (8)

166:13,13 167:16

182:23 213:13,23

comforted (1) 41:1

comment (19) 18:5

167:13 168:21

171:18.23 187:21

188:14,19 189:13

commentapproval (1)

commented (1) 139:1

comments (27) 33:1,3,9

195:12 196:12 204:13

concerned (13) 43:25

44-15 56-5 62-23

69:23 80:6 125:9

135:8 141:2 142:23

172:7 180:4 185:15

203:25

consultant (18)

171:5

207:19

colleague (1) 81:23

co (1) 44:8

73:17,19 122:14

concerning (1) 211:14 concerns (5) 44:13 124:8 162:2 210:16 212:18 conclude (1) 92:13 conclusion (7) 111:8 113:10,20 115:23 131:3 143:22 148:6 conclusions (1) 190:1 conditions (2) 52:10 59.5 conduct (1) 115:17 conduit (1) 128:19 conference (5) 7:13 13:25 14:3,7 15:2 conferences (1) 14:16 confident (3) 23:23 46:1 143:19 confidential (6) 140:3 142:10,15,16 143:4,4 configuration (3) 103:22 104:3.9 confirm (14) 16:19 18:5 53:18 83:3 115:19 156:10 163:3 167:10,19 168:20 171:21.22 175:2 206:17 confirmation (4) 19:13 103:6 140:6 155:11 confirmed (4) 82:15 118:4 188:16 208:12 confirming (2) 194:3 201:8 conformationsic (1) 83:15 conformity (3) 52:15,20 180:5 conforms (4) 189:3,16,21 197:1 confused (7) 63:12 104:12,16,21,23,24 confusing (1) 63:14 confusion (1) 178:6 connected (1) 14:22 consent (1) 174:16 consider (17) 18:21 22:10 32:8 55:15 56:9 64:4 65:3.8.10.17 71:19 90:10 97:22 119:1 127:17 140:25 204:11 considerable (1) 4:10 consideration (3) 27:1 103.4 118.21 considerations (1) 15:8 considered (7) 27:6 31:21 34:8 65:23 92:7 97:15 199:16 considering (1) 71:14 consisting (1) 204:1 construction (29) 20:20 43:17,23 46:9 89:23.25 90:5 119:14,20,22 184:6 186:16 188:4 190:9,17 191:1,5,9 192:17,20,21 196:9 198-15 199-11 15 200:25 201:12,24

10:12,14 17:22 19:4.13 73:22 129:9 159:19 160:6 165:8 205:12.19.21.24 206:1.9.12.17 consultants (7) 27:15 135:7,14 136:5 138:1 165:3 204:2 consulting (2) 18:24 68:3 contact (9) 39:21 49:24 56:15 121:2.5.12.16.17 147:10 contacted (2) 48:8 49:23 contained (1) 62:23 containing (1) 210:6 contents (1) 212:18 continue (4) 1:4 120:21 212:4,5 continued (5) 1:7,14 5:9 215:2,3 continuing (1) 149:9 continuous (7) 160:21 167:17,19 168:22 169:21 171:19.24 contract (4) 28:19 43:9 45:21 66:25 contracted (1) 48:9 contractor (6) 23:25 39:22 124:5 160:5 202:22 204:3 contracts (2) 56:16 202:7 contributions (1) 21:19 control (45) 17:22,24 18:1,4,8,12,12 35:1,12 51:15 52:18,25 62:1,9 65:16 66:3,9 71:22 73:18 80:5 88:24 94:11 105:10.13.16 116:8 124:14 129:9 131:9,11 138:1 141:4 146:10,15,23 148:20 154:8 169:3 171:3 180:5 204:3 205:13 209:15 210:21 211:21 controlled (1) 211:23 controls (1) 17:25 convenient (1) 57:1 conversation (5) 66:6 85:11 130:2 146:2 147:13 conversations (13) 29:22 69:4 85:18 128:4 138:17 143:6,25 147:2,21,24 148:13,22 150.4 convey (1) 54:22 conveyed (1) 54:21 coordinating (1) 41:13 cope (1) 47:1 copied (22) 22:15 23:17 25:22 26:5 28:10 29:10 32:14.17 41:10.18 44:14 82:20,25 110:17 159:17,24 174:19 177-5 9 193-11 200-8 copies (2) 67:1 200:7

copings (1) 195:10 copingsflashings (1) 195:16 copy (1) 37:18 copying (10) 23:15 25:23 28:9 41:8 43:4 45:7 183:22 195:24 197:7 198:21 core (16) 38:3 209:3,5,7,9 210:9.13.17 211:21.22 212:3,5,22 213:1,2,5 cored (1) 210:7 corner (2) 10:21 199:11 correct (15) 20:9 26:6 36:4 48:14 60:23 117:24 151:11,12,13 159:2 165:11.23 166:16 210:3.4 correctly (2) 31:18 152:7 correspondence (5) 161:7,13 163:1 164:17 165:18 corridor (1) 44:23 cost (1) 23:24 costings (2) 23:6.10 costs (1) 60:9 couldnt (9) 19:10,15 36:16 69:5,7 92:10 93:21 137:22 138:5 counsel (2) 1:14 215:3 couple (6) 20:10 25:3 45:12 77:6 84:24 171:8 course (12) 8:15 23:24 41:15 81:1 88:18 92:15 176:4 183:7,11,13,14 212:16 cover (7) 42:8 87:10 93:18 98:3.14.17 100:10 covered (6) 8:15 51:14 56:4 98:15 122:18 126:11 cpd (1) 5:8 crawford (43) 32:13 33:13,18 34:6,12 155:4 158:16 160:14 161:3.4 162:19.21 167:22 168:13 169:8 170:19 171:20 183:23 186:21 187:18.25 188:6,13 190:18 192:7 194:21 195:8 196:16 197:16 18 198:7,9,14,23 199:10,18,19 200:1,6 201:4,5,7,17 crawfords (3) 188:15 189:10 200:5 crawled (1) 168:24 credit (2) 150:25 151:7 criteria (8) 11:20,20,22 75:7 90:24 95:13 98:9 208:13 critical (1) 131:1 cross (1) 159:11 crosscheck (1) 133:14 crossed (1) 135:21 crown (4) 194:15 195:3

109:25 cursory (3) 72:14,21 73:9 curtain (9) 3:13 6:6 22:19.21 74:17 184:5,11 198:24 200:11 curtins (1) 18:24 customersclients (1) 211:19 cv (10) 174:8,12,15,24 175:3,6,15,18,20,24 cvs (5) 174:7.22 175:9,11,12 cwct (14) 1:20,21 2:1,5 3:5 4:17 5:3 7:13 13:1,2 15:9 66:22 67:3.13

cwct0000046 (1) 67:10 d (1) 35:19 daj (1) 118:1 damage (1) 44:6 dan (22) 26:1.4 41:12,18 52:3 64:20 84:17 106:8 107:2,9 109:13,23 110:20 134:17 139:22 145:5 146:18 150:14 181:7 182:2.7 207:20 daniel (15) 1:7 3:13 32:18 63:5 118:2 161:4,6 162:20 168:19 177:20,21 178:15,20 179:18 215:2 data (3) 4:25 85:5 140:6 database (2) 121:4,6 datasheet (7) 80:20 163:11,16,22 164:10 167:1 172:22 datasheets (3) 72:2 73:16 164:13 date (2) 200:19 208:11 dated (12) 4:18 12:22 32:12 41:6 51:25 67:11,21 81:23 100:9 106:1 151:16 152:24 day (15) 12:16,17 13:5,11 29:18 49:16.18 63:25 105:19 160:9 162:20 168:15 183:6 187:19 192:6 day121689 (1) 207:2 day322511 (1) 64:2 day3251413 (1) 62:18 day3512317 (1) 1:24 day3520210 (1) 18:19 deal (2) 41:19 46:14 dealing (2) 40:21 176:18 deb (1) 28:11 debate (2) 161:16 168:5

deborah (3) 28:9

210:25 211:2 debris (1) 12:1

decide (2) 126:12

decided (5) 45:19 46:19

108:1 155:11 173:2

decision (10) 37:7,14

39:1,3 92:23 108:4,10

172:25 173:4 208:23

184:15

196:3 197:25

currentfuture (1)

coping (2) 196:2,12

decisions (1) 38:20	64:22 125:1 185:23	difficulties (1) 128:2	78:16 87:10 95:24	draft (3) 28:15 30:2
dedicated (1) 78:25	191:6 204:4	dijon (1) 7:24	100:20 105:11 107:19	156:23
deferred (1) 204:6	designing (1) 6:7	diminish (1) 55:12	112:14 113:14 115:2	drafted (1) 156:25
definitely (2) 93:22 198:17	designs (7) 16:15 17:7,9 20:4 35:4 52:19 56:22	dipping (1) 55:18	118:11 124:2 126:21 130:21 142:2 145:8	draw (4) 129:24 143:2
		direct (4) 51:2 90:19 114:18 165:7	158:5 165:25 184:11	148:6 176:15 drawing (44) 30:1,3,2
degree (2) 50:19 183:5 delamination (2) 12:1,6	desired (1) 175:5 desktop (6) 91:22	directly (8) 14:22	185:12 186:3 203:6	31:2,4 33:9 41:13
delivery (1) 174:25	101:13,15,19,25	19:24,25 33:17 128:23	doesnt (4) 43:22 139:6	103:22 104:2,6 160:
demonstration (1) 9:21	102:17	169:8 172:16,23	145:9 166:3	161:22 181:14,24
density (1) 209:3	detail (10) 4:10 25:4,6	director (4) 49:11	doing (28) 6:15 24:24	184:9 188:13,15
department (1) 73:2	68:8 87:12 98:5	56:15,19 177:1	35:6 47:11,11 56:18	189:22
depending (1) 46:18	122:10 157:11 179:12	directors (1) 16:22	63:22,23 68:1 74:9	190:6,7,13,15,23
deprive (1) 201:22	196:2	disagree (2) 158:9	76:2 80:22 88:19 93:3	191:23,23 192:4
describe (1) 44:19	detailed (10) 27:25 51:5	164:25	146:24 149:1,1,5,8	195:9,9 196:23,25
described (4) 94:20	93:3 97:13 98:13	disagreed (1) 13:16	159:10 176:24 182:21	197:5,12,17,22 198:
103:3,18,21	101:2 115:22 128:8	discharge (1) 208:2	183:4,11,13 186:1,9	199:4,14,23,24
description (4)	176:2 185:1	disclose (1) 130:5	212:16	200:1,4,15,17 201:1
15:14,17,20 178:5	detailing (4) 46:16 47:7	disclosing (1) 128:2	domestic (1) 210:2	drawings (83) 16:20
design (161) 5:7 6:4	49:5 184:24	discount (7)	done (45) 25:11	24:25 27:20 33:1,8
10:10 14:23 15:19	details (22) 11:25 49:13	153:3,6,8,13,17,19	27:9,15,16,22,24	34:8,13,19 54:4,6
16:18,25	54:1,19 83:8 88:21	154:1	28:1,4 29:17,21 48:17	61:12 62:4,14 68:19
17:3,3,10,17,17,23,25	97:7 98:14 100:17	discounting (1) 154:11	52:24 61:9,22,25	81:3,7 84:22 111:10
18:1,2,4,8 19:16 20:20	101:3 121:9 126:1	discounts (3)	62:8,10 66:12 72:25	113:18,22,23 114:5
21:1,10,11 22:11 26:9	130:9,11,22 132:24	154:9,14,16	73:10 74:11 81:8	117:23 122:20 128:9
27:25	135:9 159:10,20 160:2	discrete (1) 174:6	116:7 124:11,13	176:5,12,18,21
30:2,7,9,11,15,17,18,19,		discuss (16) 22:22	125:5,6 126:2 129:3	178:14,20 179:1,22,
31:3,14,20 32:4,8	determine (1) 27:9	33:2,4,14 49:18 50:25 76:17 77:4 85:20	138:9,10 141:11	181:2,7,8,15,16
33:23,24,24 34:2	developed (2) 169:17 170:12	99:19 109:15 115:2	145:21 151:22 152:7 158:10 172:18 178:8	182:13
35:1,2,24 36:6,17 40:5 41:17,23 42:7,21	development (7)	140:13 147:12 151:23	188:16 191:21 201:25	183:18,23,24,24 184:5,11,16
44:23 45:8,14,18,24	87:17,18,20,22,24,25	186:4	205:16 206:10,15,24	185:3,5,14,19
46:10 47:11,17	168:11	discussed (16) 16:4	dont (95) 7:12,14,16	186:5,11,14 188:4
48:7,22 49:15 51:5	deviated (1) 184:8	23:7 25:3 49:15 50:1	8:7,8 10:9 11:17 18:2	189:9 190:3,25,25
52:5,13 53:1,23	diagram (2) 99:1,2	53:25 67:19 81:10	27:17 29:4,5	191:20 192:17,20
54:3,17,22,23,25	diagrams (1) 8:24	86:11 113:18	30:9,11,19,21,21	193:2,19,23 194:5,1
56:6,10,12,17,20	didnt (86) 5:11 24:8	114:18,19 115:15	31:24 32:1	195:4 198:14,15,18,
58:20 61:11 62:1	35:5,6,10 42:7,16 50:4	117:14,17 168:1	33:16,17,18,20 40:21	200:11,25
64:7,10,17,17,18,20,21,2	2 51:16 55:13 62:2	discussing (3) 79:6,9	41:4 42:21 43:18	201:3,9,13,17
65:7,10,16 66:25	74:4,5 78:19,19 79:18	172:19	44:17,18 45:17	205:11,20 206:8,13,
68:13 73:18,19,24	80:10 87:23,25 88:1,9	discussion (9) 11:23	50:14,15 64:12 73:6	drawn (5) 104:9 131:3
74:22 77:25 80:11	89:2,12 94:9 95:24	20:5 34:6 98:9 105:21	74:3,5 76:11 78:12,12	137:2 182:19 190:1
91:24 93:3 103:1	96:24 97:1	106:17 109:2 114:25	80:24 81:20,20 88:15	dubai (2) 8:1,2
114:23 116:19,20,23	99:13,15,16 100:2	115:7	92:14,25 93:25	due (7) 41:15 81:1
117:3 120:3 132:19	101:7,10 102:17	discussions (13)	94:6,7,11 98:4,20,22	92:15 106:10 149:15
137:4 141:24 174:25	104:8,15,19 118:6	14:4,6,9 23:9 81:17	99:21,22 104:22	176:4 211:22
176:3,8,9,10,12,16,17	127:13,20,20 128:12	110:9 112:1 113:6	106:19 107:23 108:16	duo (9) 135:23
177:23 178:15 179:10	129:4,5 130:16	114:15 178:15 184:20	109:7 110:24	136:3,6,8,20,25 137
182:15,25 185:17	131:3,16 133:13,17	208:6 213:4	114:10,17,24 116:11	139:2,4
189:3,16,22 197:1	138:22 140:19,24	docs (1) 163:21	118:17 119:22 120:11	durability (1) 136:14
202:1,4,5,11,15,24	143:9 144:11,25 145:1	document (31)	140:22 142:5,6 143:16	duragloss (1) 60:11
203:3,7,21,25	147:16 148:7 157:6,25	2:8,17,19 3:5 4:4	146:1 147:14,15	duration (2) 9:24 66:2
204:1,5,11,14,21,24 206:11,23,25	158:4,12 160:1 161:15 162:4,13 164:25	22:13 23:12 37:17	148:18 149:13,22 152:11 159:22 161:25	during (13) 13:5 14:6 16:14 20:21 23:3
207:4,7,15,17	165:1,5 167:4 170:15	58:9,14 67:23 68:3 74:14 90:9 93:23	164:2,3 165:6 167:25	33:18 38:22 61:9
208:10,12,22 209:9	171:9 172:14 175:22	94:14 98:1 100:13	173:7 176:24 179:2	67:25 122:25 176:8
designeddeveloped (1)	176:24 180:18 192:18	105:18 109:9 119:13	185:20 190:14 193:3	183:11 202:2
212:2	193:22 194:3 203:4,6	121:3 140:2 142:9	200:23 204:23 205:16	duties (3) 20:20,24,25
designer (44) 20:24	209:5 210:1,12 212:23	143:11 149:4 156:2,23	207:4 208:4 210:18	duty (1) 21:3
21:7 35:23 39:14,24	213:4	162:14 163:21 174:17	doomed (1) 44:10	(-)
40:2 41:2,12,25 42:19	die (1) 181:8	documentation (1)	door (1) 44:8	
45:16 46:16,17	dies (1) 181:16	148:25	doublecheck (1) 118:18	E
47:3,6,7 48:6,10,25	difference (5) 93:7	documents (24) 2:4	doubt (1) 141:24	
52:22 53:19 54:15	102:8 113:10 150:25	36:8 39:8	doubts (1) 99:25	e (38) 22:16 23:15
56:18 61:20	170:16	86:16,18,22,24 88:13	down (30) 3:10 4:6 6:22	24:21 27:20,22,24
65:20,21,25 66:4	differences (1) 78:17	93:15 97:24 98:17	7:5 9:22 10:16 44:23	28:1 31:6 34:7,7,12,
71:19 73:25 79:18	different (12) 35:16	104:3,6,19 105:19	59:6 68:17 70:11	68:19 88:16 103:4
88:17 97:15,22,23	77:11,18 78:10,15	118:8 128:2 130:5	85:23 89:4,20,21 95:8	108:17,21 125:2
105:9 108:23 114:17	93:5 96:24 102:6	140:9,16,24 144:6	97:11 99:4 111:21	131:10 141:7 155:4
131:13 185:18,22,25	107:7 108:6 124:7	145:9 177:22	128:8 129:8 153:2	158:16,22 163:24
186:6 206:14	150:8	does (35) 4:2 9:6 10:7	159:23 161:15 169:11	165:8 171:14 176:19
designana (12)	differently (1) 27:5	11:7 12:7 46:21 51:16	177:19 178:13 201:2,4	178:14,22 186:4
designers (13)				107 10 100
15:5,23,25 24:6 40:4 46:22 55:25 56:1	difficult (5) 127:22,23 129:14 132:5 189:1	52:25 68:25 70:25 71:23,24 72:13 73:8	205:6,8 dr (1) 4:19	187:19 188:25 191:2 197:4 199:9 200:6

:21 24 0:18 8:5 :14 19 10 3:9 ,15 8.22 3,18 :3 15 37:7 :24 25

2,17 :2 201:13,22

earlier (9) 25:3 42:24 81:22 86:4 87:8 110:7 118:14 169:19 179:21 early (4) 19:21 48:20,22 easier (1) 33:2 edge (1) 181:11 edition (1) 11:5 educated (11) 63:12 65:18 80:16 87:3,6 96:3 104:24 126:24 143:21,24 178:8 education (1) 133:10 effect (6) 36:16 40:25 156:19 157:4,20 159:1 effective (1) 18:21 eight (1) 183:15 either (12) 7:14 50:11 55:14 96:13 107:23 111:1,3 124:4 125:1 136:10 176:9 212:22 elaborate (1) 175:4 element (4) 194:15 196:3,9 202:23 elements (2) 180:3 elevations (1) 19:12 elongation (2) 9:3,12 else (28) 7:15 18:17 27:21 34:7,12,18 39:23 44:24 47:11 74:1 81:6 87:15 88:13 101:12.18 110:17.18 113:6 114:11 119:25 142:4 143:23 149:4 152:13 157:14 167:4,6 email (137) 12:18,20,21 14:21 22:15 23:14,18 24:17,19,20,24 25:21.22.24 26:5.10 29:9,14,17,21,23 30:6,15 31:9 32:12 33:13 41:5 42:24 43:1,2 44:14 46:7,9 52:4 53:5.6 54:11.16 74:15 75:1 80:18 82:2.10.12.23 83:8 84:3,13,13 92:16,19 95:4 109:21 110:14,16,18 111:14 114:24 115:6 119:14 122:2,4 129:25 130:20 132-23 136-17 139-19 143:18 144:5,21 148:25 150:7,8 151:15,15,17 154:24 155:5,15 156:3 158:14 159:23 160:11 161:4 162:18 163:7,9,13,18 164:14,21 167:8,24 168:13 169:7,19 170:20 171:20 172:1,21 174:19 179:9 180:14 186:17,21

72:25

198:24

210:22

28:8,10,24

81:21,23,24

187:5,17,24 188:21

192:6 194:10,19,21

195:1.23.23 197:25

200:5,9,9,19 201:2,3

210:23,25 211:10

198:19 199:18

212:10,11,18 emailing (1) 168:13 emails (12) 41:17 46:11 82:4 110:6,12 161:16 172:17 177:3,6,9,14 179:2 employ (1) 45:21 employees (2) 64:3 65:2 employers (3) 27:19 58:6 61:13 end (12) 16:7,9 33:22 37:6 39:22 49:14 123:14 128:7 144:5 150:23 158:22 208:8 ends (2) 65:6 91:15 enduse (1) 98:17 engaged (3) 46:3,13 51:11 engineer (15) 5:19,22 6:1,12 17:6 19:8 73:21 77:13 135:4 137:18,20 160:3 167:7 171:3.5 engineering (3) 20:4 50:20 93:4 engineers (3) 137:24,25 168:10 enough (14) 40:5 46:25 104:15,22 130:17 135:7,13,14 157:9 170:14 178:8,8 198:16 206:6 enquiring (2) 123:8,22 ensure (4) 19:7 48:25 52:19 101:25 ensuring (1) 16:15 entail (1) 188:9 entering (4) 147:1,20,24 148:13 entire (2) 114:2 172:12 entirely (1) 184:23 entitled (1) 4:9 entrance (2) 197:10 entry (2) 105:23,25 envelope (2) 23:24 134:3 envelopes (2) 7:2 67:3 equal (3) 59:9,15 61:2 equivalent (1) 113:13 error (1) 67:22 errors (2) 52:14,20 es (2) 61:12 62:4 establish (2) 206:22 207:3 established (3) 89:25 203.8 9 estate (2) 48:20 174:13 estimate (1) 183:13 estimated (2) 123:16,24 **estimating (7)** 29:2 43:12 61:9 73:2 81:10 123:15 144:3 et (5) 22:17 126:12 127:8 212:8,8 etc (2) 122:19 211:19 eternit (3) 99:4,8,20 euro (1) 127:14 even (18) 18:3 47:6 72:7,13 104:16,23 108:6 113:9 127:20

137:13 141:14 155:20

160:20 167:17 169:6

171:5 175:22 177:8

193:21.25 206:16.19

61:23 67:25 99:7

62:23 69:22 71:24

73:8.11 80:6 81:5 93:9

98:7 113:8 141:2,13

146:9 172:7,9 205:9

186:20 187:5 192:6

186:13 213:24

30:1 31:2,7 85:7

86:15.23 127:5 132:20

192:16 201:23 208:7

52:5 112:4 147:1.20

149:25 155:9 171:25

174:24 184:5 187:8

194:15 195:3 196:2

198:24 200:11 201:7

193:9 207:10 213:21

4:9,10,17,23,24

5:20,21,24

7:2,7,7,24

6:2.4.8.14.25

8:15,22,23,25

9.9 10 10 14 18

19:1,3,8,13 20:4

72:5.14 73:9.21

80:17,20 92:11

94:16.18.20 97:12

100:4 118:22 122:24

125:16,17 126:22,24

127:21 128:12 129:9

132:13 133:18 134:25

136:7,12,16,17,19,23

137:7,24,25 149:7

155:5.12.16.17.23

156:20 157:3,5,25

158:6,7 159:19

160:2,19 163:1

10:12,14,19 11:21,22

12:7,12 17:21 18:21

32:8,9 64:5 65:3,10,23

186:15

family (1) 146:20

147:18

evening (1) 110:13 event (2) 14:15 15:9 eventually (2) 45:16 124:24 ever (76) 14:25 15:13 20:3,5 21:6,10 23:9 26:13,15 27:9 29:2,9,11 33:18,21 34:6,12,17 50:25 55:4,22 56:5 63:22,23 66.6 67.23 74.8 79:5,11 81:2 87:2 97:5 98:20 99:19.25 100:13 101:18 103:11 108:17 114:7,11 115:11,17 116:9.11.14 119:1 121:19,22 124:25 138:5.12 139:9 143:3.5 148:22 150:1 154:16 162:4.7 167:19,22 171:13.14.17.25 172:5 182:23,25 203:2,11 206:12,21 211:7 212:10 213:4 every (10) 64:13,13 77:6 132:18.21 156:16 168:24 170:5 182:14 202:10 everyone (8) 1:3 27:14 44:24 75:10 180:24 193:6 204:7 208:2 everything (4) 61:23 106:12 180:3 182:19 evidence (23) 16:6 38:19 57:6 62:16 63:25 68:25 70:25 87:1 98:20 99:13 101:7 102:5 104:21 116:1,4 120:11 122:9 139:15.17 153:12 173:19 213:21 214:5 ex03 (1) 181:8 exact (4) 103:22 104:2,8 130:22 exactly (9) 8:17 40:14 73:13 76:18 99:2 112:25 122:16 126:10 176:3 examination (3) 72:14,21 73:9 example (9) 14:9 73:14 154:17 177:23 179:7 180:9 183:19 194:9 198:8 examples (5) 6:24 7:2 180:12 183:18 186:13 exchanges (2) 36:3 178:10 existed (1) 78:19 existing (1) 195:15 exo00001291 (1) 156:3 exova (5) 158:17 160:7 171:14 206:3,5 expanded (1) 32:25 expect (6) 62:2 80:1 105:14 180:2 186:7 expectation (2) 74:11 186.8 expected (17) 46:22 61:22,23,24 65:22,25 66:13 79:23 105:11

124:11,13 125:4 fair (5) 166:10 176:11 186:3 204:15,21 206:10 faith (1) 52:14 expecting (2) 62:12 fall (2) 12:13 16:22 147:24 falling (1) 169:1 familiar (7) 58:9,10,11 experience (4) 51:7 175:4 191:21 202:21 experienced (1) 56:1 experiences (2) 4:9,17 expertise (6) 72:12 94:3 fan (2) 37:1,11 157:2 204:17.19.23 far (19) 27:4 40:24 42:5 experts (2) 204:6,15 explain (15) 7:12.14 15:8 35:16 40:14 55:4 63:8 73:13 104:1 108:7 111:25 115:23 feature (1) 12:6 138:12 185:4 209:7 february (4) 174:20 explained (5) 48:13 55:7.8.22 65:24 feel (2) 50:7 133:17 explaining (2) 35:17 feelings (1) 208:9 36:21 felt (1) 138:6 explains (5) 11:22 ferrier (1) 22:25 13:2,3 49:14 95:12 few (4) 110:21 154:5 explanation (1) 37:4 explore (2) 22:9 68:8 fibre (2) 96:12,21 exposed (2) 169:17 field (1) 100:24 170:12 figure (1) 107:15 expressing (3) 24:10 figures (2) 112:5 117:20 36:10 158:6 file (11) 21:15,19 25:25 expressly (1) 115:11 extending (1) 9:2 extent (4) 20:17 156:10 final (5) 98:10 182:21 167:23 203:5 exterior (1) 31:21 finalise (1) 54:2 external (28) 4:23 6:25 finally (3) 119:8 131:22 7:25 10:18 11:21 financial (1) 150:1 31:22 37:20 40:2,4 42:9 45:8,14,20,24 find (18) 25:3 47:23 46:3.10 51:18 90:12 119:14,20 158:7 159:11.21 167:23 185:22,25 202:11,15 externally (1) 8:25 extract (2) 37:11 fine (1) 180:23 105:23 fingers (1) 135:21 extractor (1) 37:1 finish (5) 86:2 145:1 extracts (1) 8:24 extrusion (1) 54:2 finished (1) 168:22 finishes (1) 60:11 fire (130) faade (19) 5:24 6:5,10,13,21,23 7:12 12:13 31:22 34:9 38:21 41:23 50:22.22 51:1,5 183:4 204:25 205:2 faades (5) 4:24 6:4 13:21 51:18 200:21 fabiunke (1) 24:21 fabricated (2) 26:25 180:8 fabrication (10) 26:12 46:17 47:8,12 49:6 180:1,10 184:25 204:16 205:4 fabricator (1) 200:21 fabricators (3) 201:10 211:25 212:6 facades (1) 4:11 face (4) 25:12.15 33:21,21

164:17,22,23 165:1.2.6.8.18.21 166:11,22 168:7,10,23 169:17.18 170:12 171:3.5 204:2.20 205:12,19,21,24 206:1,9,12,17,22 207:3 210:16 211:14 213:1,2 firebreak (3) 19:12 150:10 151:18 firebreaks (7) 151:22 152:4.12 155:10 156:11 158:12,23 firerated (1) 6:6 fires (11) 7:12.23 8:1,2,5,13 209:25 210:2.6 212:13.19 first (29) 1:17 3:9 15:15,16 22:20 32:18 39:18 43:13 69:21 75:6 88:7 90:4 91:11,12 102:15 105:25 122:8 123:7 127:15 128:7 141:14 143:7 146:4 163:24 171:8 188:1 207:19 208:22 212:15 fit (1) 195:16 fitting (1) 118:5 five (2) 9:2 173:11 fixed (6) 25:13,15,17 90:18 122:18 127:8 fixing (3) 25:12,13 208:18 fixings (2) 78:1 152:11 flame (3) 9:3,12 92:2 flames (1) 9:2 flaming (1) 12:1 flashing (1) 195:10 flashings (1) 184:9 flat (3) 160:20 floor (4) 44:22 156:17 170:5 199:22 focus (6) 5:8 9:10 20:11 37:25 54:1.19 focused (5) 5:7,9 9:19 14:23 19:22 focusing (2) 10:9 106:16 follow (10) 1:17 51:16 73:7 78:16 95:24 98:4 154:22 162:17 203:6 212:1 followed (5) 85:10 109:21 147:6 148:4 185:7 following (18) 12:16 13:25 32:25 33:13 53:17 60:10 102:10 121:25 126:9 129:17 158:22 184:17 192:4 197:5 200:4 208:6,13 211:17 follows (1) 96:8 followup (1) 13:7 fordham (2) 22:17 119:13 forecasts (1) 112:13 forgot (1) 150:17 form (9) 95:24 122:22 128:10,14 133:17

150:5 153:17 156:4,5 formal (1) 176:9 formally (4) 16:4 22:11 75:11.22 formed (3) 58:5 96:2 209:2 forming (2) 178:14 208:8 formula (1) 133:19 fort (3) 74:19,21,24 fortnightly (1) 110:8 forward (26) 24:18 28:6 29:13.17 55:5 82:17 109:8 114:22 119:7 123:2 124:21 125:11.22 126:4.18.22 131:23 132:15 133:25 134:8 146:13 154:3 172:21 173:3 174:8 187.10 forwarded (2) 31:17 208:8 forwarding (6) 30:6,10,12,14,16 31.10 found (3) 101:3 137:18.20 four (3) 64:22 68:17 89:21 fourth (1) 62:19 fr (12) 71:11 78:17,19 106:8 107:2,6 108:2 211:21 212:5.22 213:1.5 fr5000 (12) 70:14,23 71:8.15.20 78:9 79:11 86:5 102:3 107:9,21 141:19 frame (1) 90:19 france (2) 7:24 8:2 french (3) 28:9 210:25 211:2 frequently (2) 77:9 103:17 front (5) 11:4 33:3 43:10 117:4 123:14 fulfilled (1) 16:10 full (3) 19:8 100:17 175:6 fullscale (2) 9:19 10:18 fully (8) 40:22 55:2 93:1 102:11 155:20 157:6 169:17 170:12 further (20) 6:22 7:5 52:4 89:20 95:8 109:22 113:6 118:6 133:24 161:18,18 166:2 168:11 172:6 181:21 192:5.5 197:10,19 198:10 G ga (3) 183:23 199:5 200:15

gap (2) 179:13 180:10

graham (1) 16:6

17:24 56:24

grange (39) 1:13,15

2:11,17,20,25 3:2,4

57:2,21,22 74:7,8

garnock (1) 7:6

gather (1) 3:3

gave (4) 1:18 60:21

162:10 172:3

general (11) 8:4

52:14,20 59:12 81:24

gear (1) 44:9

85:18 114:19 178:19 179:1 183:24 185:4 generally (7) 12:17 64:8 72:1 85:15 138:3 184:22 203:21 geof (2) 211:1,6 get (56) 2:13,23 8:24 9:21 10:16,24 11:20 14:16 21:3 28:12 45:8,18,20 46:10 47:20 53:23 54:7 17 55:21 65:15 80:2 97:11 98:8.10 106:23 112:16 121:22 124:23 134:21 135:21 138:5.25 140:4 142:18 143:2,7 146:19 147:8 150:16 152:5 154:9.16 158:10 159:17 172:10 176:18 180:17 181:23 190:4,23 201:20 203:4.19 209:15 211:19 214:1 getting (11) 15:20 32:2 104:25 133:1 153:13,17 185:14,19 186:15 194:2.7 gf (2) 198:24 200:11 give (12) 9:21 27:1 55:1 89:14 135:13 140:12 145:2,24 173:15 178:3 210:10 213:16 given (9) 47:21 55:16 60:12 104:3 105:2,4 111:24 130:1 208:2 gives (1) 140:7 giving (2) 164:21 170:1 glass (1) 200:21 glazing (1) 38:1 global (2) 86:20 100:8 goes (8) 25:6 49:14 72:1 83:10 155:19 166:2 207:6 208:20 going (56) 1:4 10:16,24 18:17 20:16 26:4 29:5 33:13 40:9 47:20,22 54:1.14.19 55:5 57:23,24 58:2 66:1 72:25 75:19 78:21 80:2.4 86:17 90:22 114:9 115:2,3 132:14 133:15 134:7 137:3 150:9 154:22 155:23 157:4 161:18 163:6 164:1,5 165:20 169:2 171.17 176.4 181.8 14 182:12 183:3 191:16 202:15,17 203:18 207:12 213:23 214:3 gone (7) 62:3,13 142:14 161:17 165:25 166:14 168:6 good (23) 1:3,8,9,12,16 2:20,21 12:12 52:14 53:16 75:4 83:2 84:18 85:12 120:5,6,16,23 122:12 134:18 163:8 173:9 174:4

120:4,7,24,25 125:16 127:3 133:5.7.22.23 166:18 173:8,17 174:5,6 207:8,14 209:24 213:9.13.17.25 214:11,12 graphs (1) 139:25 great (1) 54:5 grenfell (143) 6:10 9:5 16:23 17:7 19:8,10,16 20.21 21:6,9,12,13,14,17,21,22 22:18.25 27:11 33:7,19 36:5 39:20 42:8 43:10,17,22 44:15 45:19 46:4.23 48:6 49:1,13,16 53:19 55:18 56:11 58:5.20 59:12 60:1 62:11 65:19.23 67:13.24 68:4,14 70:23 71:15 72:20 74:22 76:1 78:8 79:20 80:11,25 81:4,7,19 85:4,21 86:12 92:23 93:8 94:4 96:1,25 100:1,7 101:14.15.18.20 103:12 105:7 106:2,7 108:11,14 109:15 111:7,16 112:14,25 113:7 114:3,13,16,19 115:1,2,4,8,10,14,18 116:3.13.15 119:3 123:19.19.21 124:9.11 125:2 131:6 141:1.2.6.25 143:13 146:7 149:17 152:17 153:13,25 155:5 158:21 170:25 171:10 172:13,20 173:1 176:3.5.9 179:10 181:20.24 185:8.9.10 188:10 192:8 201:1 202:2 203:2 204:22 212:25 213:6 grey (1) 137:19 ground (1) 199:22 grounds (1) 129:4 group (1) 211:24 guess (2) 108:16 130:7 guessing (6) 108:9,15 127:25 148:18 188:11 193:4 guidance (17) 51:13,18 61:15 129:17,18 146.15 23 147.12 17 148:2,10,17,20 149:3 162:9,17 167:5 guide (11) 86:21,22 93:17,19 94:5 95:3.18.19 96:4.14 97:25 Н

h92 (4) 58:14,18 66:18 70:7 hackley (1) 16:6 hadnt (14) 10:12 46:21

85:17 88:10 102:16 125:6 141:12.21 148:7 149:8 159:20 178:7.8 190:20 half (4) 4:15 12:19

fail (2) 44:10 138:11

failure (3) 11:19,20,22

110:15 210:24

hammersmith (1) 85:4
hand (3) 123:3 131:24
169:20
handed (2) 76:22 78:24
handwriting (3)
38:12,13,14
<b>happen (3)</b> 179:4 186:14 194:8
happened (13) 15:23
16:21 19:15 31:11
40:5 71:4 76:5 86:7
165:12 176:10 179:3
186:12 190:3
happening (3) 136:24
168:14 185:16
happens (2) 124:23
166:13
happy (11) 19:14 23:25
34:5 108:18,21 137:9,10 193:6,13
194:3 207:11
har00000978 (1) 29:13
har00001999 (1) 200:18
har000019992 (1) 201:6
har00003634 (1) 179:8
har00003636 (1) 180:13
har00003638 (3) 154:24
167:8,12
har000036381 (2)
162:19 168:12
har000036382 (2) 160:10 161:3
har000036383 (4) 159:7
160:14 161:19 167:15
har000036384 (2)
155:2 158:15
har00003785 (1) 181:3
har00003866 (1) 37:19
har00004089 (1) 181:20
har00004224 (1) 182:5 har00004443 (1) 197:6
har00004443 (1) 197:0
har00004669 (1) 199:19
har000046703 (1)
199:25
har00004743 (1) 200:5
har00005711 (1) 24:19
har00005786 (1) 28:7
har00005916 (1) 41:7
har00006011 (1) 23:13
har00006153 (1) 43:1 har000061531 (1) 45:5
har000061532 (1) 43:7
har0001014910 (1)
103:15
har000101492 (1) 39:18
har000101493 (2)
35:15 48:3
har000101495 (1) 68:11
har000101496 (2)
76:13 203:22 har000101497 (1) 205:6
har000101497 (1) 203.0
177:17
har0001018442 (1)
102:22
har00010415 (1) 51:22
har000104156 (1) 52:9
har0001041916 (1)
36:19
har000104192 (1) 42:14 har000104193 (1) 49:10
har000104195 (1) 49:10
(-)

178:12 hearing (3) 1:4,4 214:15 har00012103 (2) 163:12 164:15 har00012104 (1) 163:20 hard (1) 137:20 harley (146) 3:13,17 8:18 14:18 15:14 16:7,11,14 19:6 21:18 22:4,6,10,19,21 23:17,21,23 24:9,13 25:24 26:8.16 27:9,13,18,21 30:1.2.7.9.23 31:2,3,6,7,14,20 32:8 34:18 35:4,23 36:5.9.12 37:18.19 38:22 39:11,21 40:3.16 41:9 42:7 44:19 45:25 46:4.23 48:9,14,18,20 49:12 50:18 51:4,23,25 52:19.22 54:24 62:3,12,22 65:10,22 68:19 71:14,24 72:5.14.24 73:10 74:17 75:23 77:1,5 81:2.6.17 82:4 83:21 84:2 88:14 93:6,10 94:6 102:25 108:20,24 110:19 113:6 114:5,7,11 116:10,14 119:25 121:15.22 124:15 125:2 139:2.15 142:3.4 149:10.16.20 150:1 151:7 153:20 156:4.6 160:7 163:13,21 172:25 173:5 174:25 176:14 177:21 183:12 185:5 190:15,16 192:25 193:23 194:4 200:8 201:12 203:11 204:10,13,20,25 205:2 harleys (9) 18:20,25 24:5 46:14 52:21 76:16 173:6 206:21 207:3 harris (25) 23:14,17,18 24:22 25:23 28:8,10 29:8.15.17 30:6 31:11 32:2 40:21 41:5,8 43:4 44:13 45:7 111:4 144:2 174:20 175:13,17,23 hasnt (2) 199:8,15 havent (1) 54:11 having (25) 5:9 7:18 19:22 32:7 36:16 66:6.12 69:4.24 87:2 95:20 104:5 109:2 111:25 123:3 131:24 140:7 141:23 143:24 151:23 155:15 168:22 175:20 201:17 207:6 headache (6) 122:13 127:16,17,22 129:22 134:7 headcoping (1) 197:1 headed (2) 66:19 122:5 heading (1) 100:24 health (2) 21:15,19

heavily (1) 103:20 hed (11) 19:19 48:19,22 49:2 50:20.21.23 110:23 139:11 145:13 184:21 hefty (1) 153:8 height (11) 75:9 79:12 83:3,8,12,17,24 89:24 90:6 91:1 95:15 heights (1) 7:3 held (2) 50:13 117:6 hell (1) 191:23 help (44) 9:6 10:7 11:7 12:7 16:10,23 42:14 52:18 54:5 55:21 73:12 92:7 107:1 108:1.13 114:2 118:19 122:21 123:13.18 128:10 129:22 136:2 137:24 144:2,15 151:21.24 152:2.2.8 153:19,21 165:6 173:5 175:23 182:12 190:2,5 193:17 194:23 198:12 199:14 211:18 helped (4) 48:19.21.22 112:18 helpful (2) 203:12,14 helping (2) 112:16 121-22 here (29) 22:15 23:17 41:10 59:1 61:24 70:10 71:8 84:19 93:18 98:9 113:1 120:13 128:13 131:2 156:19 157:20 163:9,14,18 168:12 174:19 175:17 189:1 192:1,25 193:3 199:8.25 214:4 hes (29) 13:14,19 24:24 30:10,12 31:5 32:22 33:13 36:21 43:22 45:14 63:17 102:23 144:5 161:13 166:5 170:7.8 171:7 178:13 185:18 187:1,6 188:16,19,24,25 195:19 198:22 hi (20) 12:24 25:2 28:11 41:11 75:3 84:17 109:23 110:20 139:22 146:18 158:20 168:17 181:6,22 187:20 193-12 196-18 198-9 199:21 211:12 hidden (1) 208:18 hierarchy (4) 203:25 204:12 205:1,3 high (8) 125:19.21 126:17 132:9,16 134:2 137:2 154:6 higher (1) 205:2 highest (1) 93:2 highly (1) 89:16 highperformance (9) 91:12 132:7,11 133:9 134:4 137:1 139:12 143.8 149.24 highrise (2) 7:25 48:18 hilti (5) 77:18 78:2

151:11,14 152:3

himself (2) 94:10 105:14 hindrance (1) 2:20 hinge (1) 188:20 hit (3) 43:10 125:11 132:5 hoban (1) 168:24 holding (3) 74:18,21,24 hols (1) 28:13 honest (9) 14:12 50:9 86:3 87:3 110:24 129:8 140:5 152:19 200:23 honestly (4) 113:16 145:10 164:2 170:15 hook (1) 68:21 hope (4) 134:18 150:15 213:17 214:1 hoping (4) 123:2 131:23 133:24 134:8 horizontal (3) 25:16 156:11 158:23 hour (1) 213:17 house (10) 43:17,22 82:5.10 84:25 146:22 150:10,22 151:18 152.4 housed (2) 36:25 37:10 however (5) 39:24 43:16 44:9 180:17 182:8

id (23) 11:11 16:19 19:12.19 26:18 45:25 49:24 63:15 72:18 88:17 95:21 99:9 108:9 116:5 127:25 143:14 144:2 166:22.23 170:16 185:9 206:14 210:19 idea (2) 84:22 213:16 identical (1) 175:13 identify (2) 3:9 114:6 ie (4) 34:14 40:12 46:12 212:18 ill (1) 214:3 im (41) 2:22 8:9 20:16 26:13 38:17 43:25 57:23.24 58:10 73:11 74:23 86:3,17 88:15 114:14 115:4,21,25 121:1 126:15.16 148:18,24 154:22 155:22 163:6 165:10.20 166:7 176:4 181:24 193:4 203:9,18 205:25 211:7.10 213:20,21,22,23 images (3) 7:9 9:21 25:4 imagine (9) 45:19 85:24 91:21 122:22 124:18 128:10,14 140:22 immediately (5) 42:18 83:13 96:5 133:4 impede (1) 135:16 implication (1) 46:11 implicit (1) 26:21 implies (1) 127:23 importance (1) 51:6 important (15) 15:4 87:20,22,24,25 98:16

125:25 129:5 130:10.14.17.21 132:2,24 186:25 importantly (1) 122:20 impression (6) 55:1 141:25 142:17 171:1 198:17 206:21 inaccuracies (1) 175:24 inaccurate (1) 108:7 incentive (2) 150:1,5 incidents (1) 4:22 include (1) 4:5 included (4) 12:2 18:24 86:16,18 including (19) 4:11 8:1.22 9:20 15:9 27:20 34:18 36:7 61:14 89:23 90:5.17 141:7 168:25 175:14 192:8 200:8 211:1 212:3 incorporated (3) 191:12.16.24 incorporating (1) 189:23 incorporation (3) 189:3,10,16 increasing (2) 180:17 181:10 indented (1) 70:12 independently (1) 171.15 index (2) 122:25 215:1 indicate (2) 158:5 213:15 indicated (1) 116:1 indicates (1) 11:24 indication (1) 163:25 indicative (2) 59:8,14 individual (2) 175:5 individually (1) 73:4 individuals (4) 22:17 41:9 194:12 211:1 industry (4) 49:3 50:20 87:23 212:19 infill (4) 36:22,22,24 38:2 info (4) 84:19 150:24 182:9 197:13 inform (1) 148:22 informal (1) 176:10 information (72) 10:11.16.21.22 12:15 18:11 50:10 52:13 60:6 65:14 66:24 84:6 92:12 13 18 98:8 21 105:12 113:2 119:15,15,23 123:3 124:8.24 125:1 126:6,9,20 127:1.3.6.9.18.24 129:10.14.23 130:1.12.18.19 131:19,24 132:2,19 134:7 135:6,14 136:21 137:14 138:13,18,23,24 139:1 141:6 142:2,24 144:1,9,16 145:17,21

146.8 154.21 156.4

160:5 169:20 170:4

interpret (1) 192:2

interpretation (5) 159:1

172:11 209:14

informed (1) 21:3

informing (1) 75:5 inhouse (1) 64:22 initial (3) 24:25 32:25 187:24 initially (1) 196:15 input (7) 20:4 33:24 34:2 36:6 178:21 204:21,25 inputs (1) 18:1 inputting (1) 20:17 inquiry (2) 1:14 215:3 install (1) 60:8 installation (6) 151:21 152:3,6,9 204:16 205:4 installed (7) 82:12 101:2 122:16,21 126:11 128:10 180:2 installers (1) 197:13 instance (1) 6:6 instances (1) 8:5 instead (2) 27:2 106:11 instruction (2) 187:11 192:25 insulated (1) 75:8 insulation (95) 38:3,25 57:25 68:7.9.22 69:7,8,10,14,15,15,16,23 70:1,10,22 71:1 72:22 73:14 74:15 80:19 82:11 83:4.22 84:3 86:12 87:17 88:2 89:6.14.17 91:12 92:8.17.22 93:6 94:5,19 103:16 112:7.17.20 117:22.23 118:6,12,16,25 119:1,2 121:1 122:15 124:22 125:11,17 131:20 132:7,11,13 133:9.15 134:5 139:12.12.16 141:3 143:8,8,19 146:5,14,24 148:3 152:21 153:14 154:17,20 160:16 161:20 162:5.25 163:25 164:16,23 165:13,17 166:19 168:3.3 169:23 170:8,21 171:13 172:22 insulations (4) 125:21 137:2 149:24 154:5 intend (1) 55:1 intended (3) 39:25 40:12 145:8 intending (1) 145:16 intent (5) 34:14 189:3,16,22 197:2 interested (5) 6:12 58:24 125:8 202:8 internal (5) 11:21 12:18 25:24 40:5 184:9 internally (2) 26:15 118:6 international (2) 8:13 210:2 internationally (2) 7:23

165:11,22 166:15 191:7 interpreted (2) 129:11 137:14 interpreting (1) 4:25 interrogate (1) 27:25 interrupt (1) 17:14 interview (3) 50:5,5,7 interviewed (3) 48:9 49:8,21 interviewing (1) 49:22 into (29) 1:6 4:10 18:1 25:6.22 26:5.25 28:10 29:10,23 30:2,23 31:3 36:6 44:14 51:4 75:10.24 82:25 97:6 103:3 110:17 112:5 147:1.20.24 148:13 149:13 168:24 introductory (1) 58:18 invariably (1) 169:16 inverted (1) 137:11 investigate (2) 27:21 172:5 invoice (1) 153:2 involved (23) 14:9 21:10 23:9 24:13 27:18 29:2 41:23 48:5,16 50:1 54:12 55:2 112:16 116:9 119:19 121:22 150:3 152:19 173:2 175:17 181:17 203:5 206:6 involvement (9) 17:19 22:10 55:5,12 68:14 123:21 154:11 174:12 203:4 involving (1) 212:13 irrespective (1) 169:23 irvine (1) 7:6 isis (5) 150:10.18.22 151:18 152:4 isnt (17) 26:4 48:14 112:7,22,25 125:16,24 126:8 127:23 136:19,23 141:19 160:20 167:17 169:19 170:13 200:8 issued (7) 179:14 183:18.25 184:6 185:5,19 201:24 issues (4) 152:10 182:23,24,24 istanbul (1) 8:3 item (7) 66:17,19 70:6.10 100:16 117:13 184:8 items (3) 41:19 43:11,16 its (105) 2:11 17:20 23:22 31:10 32:18 36:7,9 47:10,19 50:17 51:23.25 53:9.14 61:3,3 64:10,13 67:7,9,10,21 72:10 80:20 81:25 83:23 85:23 86:10 94:22,25,25 99:9 100:9,11 106:1,2,5,14 110.5 10 112.22 117:3,6 120:8 121:6,23 122:5 125:25

hear (1) 105:5

heard (1) 149:4

126:3 131:1

84:15 177:8 182:23

large (3) 12:21 50:21

largescale (1) 51:1

last (11) 23:19 35:21

44:5 47:20 52:11

184:15

198:21

42:18 45:17 46:19

71:2,5 74:1,3,3,5

78:19.19 87:4.23.25

75:13 77:6.7.24

88:1,4,4,9 89:12

109:7,14 110:24

123:19,20 125:25

132:9 136:25

91:8,11,22 93:1,3

94:6,7 100:5 101:15

105:3 107:23 108:10

114:5.6 119:25 122:16

126:10 127:4.20.20.21

128:12 131:3,14,16,19

138:18.21 139:9.11

142:5,6,21 145:23

146:9.21 147:2.21

148:14.16.18 152:19

153:10 155:22 157:25

158:4,10,12 164:2,3,5

165:1.6 170:18.23

171:25 173:7 175:22

180:5,6 182:21 183:4

184:24 185:18.20.21

204:13,17,17,18 208:4

209:8,17 211:2,4,6,21

knowing (4) 8:10 50:18

knowledge (24) 5:20

9:8 10:8 14:13 15:18

95:21 104:15 115:17

130:13 145:11 155:15

157:2,9 168:7 174:16

184:24 203:11 205:25

known (21) 9:7 19:1,2

49:4 66:14 77:16.23

121:5 125:19 127:12

140:21 150:3 167:3,6

130:8,13 137:9,10

206:1,4,8

knowsley (1) 7:3

209:25 210:1

26:9 51:7.12 78:14

190:12,14,20 193:3

200:23 202:12

68:2 92:17

47:19.21 66:11 67:10

132:12,19,24,25 136:14 140:7 141:17,22 142:10 150:2.9.10 151:22 152:24 155:25 156:4,5,5 160:14 163:18,20,20 165:24,24,25 166:7,13,14 167:9,13,16,24 174:9.21.22 178:6 182:16 186:25 187:25 189:1.20.21.21 191:21,25 194:20 195:21 197:8 198:3.4.7 199:11 201:9 206:14,19 iv (1) 52:11 ive (11) 22:3 27:5 36:3 87:1 159:10 165:25 166:13,15 177:7 179:2 209:24

jamb (1) 184:9 january (7) 122:1,4 133:4 135:19 139:20 141:12 144:23 jeremy (2) 82:24 83:14 job (24) 15:14,17,20 32:1 44:6 48:8 50:1 63:9 64:4 65:3 66:7,11 94:4 108:20 121:9 125:15 129:2,3 132:21 136:21 137:2,15,15 177:25 jobbyjob (1) 129:3 jobs (10) 101:16 123:2,23 131:24

134:1,3 jogging (1) 5:5 john (1) 168:24 jon (4) 82:9 122:12 144:24 151:19 jonathan (25) 2:6 3:22

132:4,15,17 133:25

12:21 74:16 75:1,15,22 77:2 82:4,21 83:1 84:14 85:2 87:21 88:6 109:18 110:2,16 112:15 114:7,12 122:5 127:4 129:23 151:14

judgement (1) 162:3 judging (1) 213:25 july (7) 41:6 48:10 150:9 151:16 195:25 196:17 208:8 julyaugust (1) 42:13

julybeginning (1) 39:22 julybeginning (1) 39:22 jump (1) 172:14 jumped (1) 210:18 jumping (1) 24:18 june (5) 28:19 29:14,16 43:2.4

K

k15 (9) 82:1,11,13,15 83:22 88:1,4,9,10 kai (1) 24:21 katie (1) 174:21 keen (4) 22:22 53:23 54:17 148:16 keep (13) 10:15,24 16:1 19:22 20:12 21:3 43:9 46:20 66:25 70:11 90:22 197:5 207:11 keeping (7) 16:2 19:18 34:3 58:22 61:17 80:16 186:1 kensington (1) 168:23 kept (5) 49:24 142:2 149:13 175:3 184:23 kev (2) 179:11 181:22 kevin (98) 17:9 19:18,23,25 20:3,6,18 32:13.18 33:17 34:3,18 36:18 38:19.25 39:10.17 42:12.19.22 45:16,25,25 46:20 47:2 48:1,6,13,25 51:6 52:19 53:1.14.18 54:14 55:16,23 56:13 61:19,22 63:22 66:4 67:19 71:18 74:8,18,23 79:23 80:15 84:15 94:9.10 105:11,14 108:25 109:1,2,4,6 117:11 141:7 157:18 176:10,17,22 178:12 179:1,9,22 180:14,21 181:4.6 183:20 185:17 186:3.9.20 187:15,20,24 192:6,25 193:12 194:11.19 195:2 196:18 197:7,18 198:10,20 199:21 200:6 201:3,5 207:20 kevindaniel (1) 32:24 kevins (3) 39:1 58:21 key (6) 13:19 23:1 94:2 121:16 178:19,25 kick (1) 176:7 kind (22) 5:5 75:14 85:1 91:12 98:4 105:12 109:17 110:1.8 113:2 124:1 125:1 132:24 145:4 150:3 159:13

160:23 176:14,15

kingspan (9) 37:7,14

38.3 82.14 103.17

142:18,24 143:9

kingspans (1) 81:24

kitchen (2) 37:11,11

knew (15) 45:23 50:4

74:12 77:17.21 78:6

87:12 102:14 126:17

know (146) 6:3 7:16

132:4,5 139:10 157:24

8:9,17 11:9 12:12,25

14:13 18:3 19:22 24:9

25.11 26.23 27.16 17

28:3 30:9,11,19,21

31:20 32:3,4 33:17

36:23 39:3 40:20 41:4

kitchens (1) 37:1

211:7,10

kinds (1) 87:3

144:12

179:17 184:16 191:1

labc (3) 86:19 88:21,23 label (1) 99:3 lack (1) 155:25 lamb (67) 20:18 32:13 34:18 38:25 39:17 42:12.19 45:16 46:5 47:2,8 48:6,25 50:13 51:6.23 53:14 55:16,23 56:6,13 61:19,22 63:22 66:4.6.11 67:19 74:8 79:23 94:9 105:11 109:2,4 117:11 141:7 176:10,17,22 178:11,12 179:1,9,22 181:4 183:20 185:17 186:3,9,20 187:15,24 191:8 192:6,25 194:11 195:23 196:14 197:7,18 198:20 200:4.6 201:3.5 202:3 207:20 lambs (13) 36:18 38:19

48:1 49:9 51:21 52:19

53:1 71:18 74:18

62:16 111:8 113:20 116:1 196:13 197:25 late (2) 47:18 146:7 later (18) 10:14 19:21 20:16 21:23 23:12 24:17 32:11 61:6 67:7 80:18 109:12,12 159:18,24 170:4 172:21 183:17.21 latest (1) 181:24 launch (3) 78:22 83:20 126:9 launched (4) 75:6,19 81:13 102:14 lawrence (30) 29:18.21 32:14 41:6,8 53:10 117:18,20 118:6 155:3 156:5 162:21 174:20 183:21 187:2,6,15,25 192:7.16 193:10 194:12,20 195:24 197:7 198:11,14,20 200:8 208:4 layout (1) 182:8 lead (3) 39:21 41:12,25 learn (1) 212:24 learning (1) 5:9 learnt (1) 212:15 least (3) 44:6 47:22 145:18 leave (2) 14:24 44:8 leaving (2) 22:3 54:12 left (8) 4:6,16 7:6 8:18 16:7 49:25 176:17.20 lefthand (7) 3:10 11:1,24 37:25 51:24 89:21 117:8 leg (1) 181:10 length (1) 9:3 let (8) 25:11 75:13 93:5 109:14 146:21 147:2.21 148:14 lets (10) 32:11 58:13 74:14 88:21 93:15 97:24 117:2 173:12 183:19 194:9 letters (1) 35:19 letting (1) 142:20 level (3) 140:1 156:17 170:5 levels (1) 184:12 liabilities (2) 52:11,12 liaised (1) 33:17 liaising (1) 56:19 lied (2) 204:17,19 lies (1) 43:18 lieu (1) 140:5 life (1) 135:9 like (27) 6:5,10 11:15 14:15 24:25 25:4 44:21 50:7 53:18 57:10 72:5 75:10,12 93.3 120.2 127.7 14 138:6 146:5 173:11,20

174:12 176:15 185:23

204:22 207:11 214:8

liked (1) 213:22 likely (10) 50:17 86:10 110:5,8,10 123:23 125:24 126:8 132:3 136:19 likes (1) 20:12 limitations (2) 89:20 111:24 limited (12) 15:7 17:19 55:23,25 65:24 68:14 118-5 129-19 148-3 168:4 200:21 203:4 line (21) 3:12 15:24 22:20 32:18 62:19 64:1 65:1 69:11,12 70:12 89:4 90:4 123:9 127:15 176:15 196:13 199:3 202:10 205:5.8 208:11 linemanaged (1) 202:13 linemanaging (2) 20:8 185:17 lines (7) 35:21 68:17 69:21 130:3,7 171:8 177.18 linking (1) 162:5 list (6) 3:10 6:22 7:25 13:6,8 117:8 listed (2) 97:14 98:25 lists (1) 207:19 literally (4) 42:4 47:23 105:1.2 literature (3) 96:15 97:19 104:13 little (10) 20:16 41:3 42:24 68:8 70:12 82:2 173:16 189:1 209:24 213:10 liverpool (1) 7:4 loads (1) 6:17 local (4) 88:24 155:12,16,17 locate (1) 182:9 locations (4) 163:2 164:18,24 165:19 london (5) 13:1 76:7 114:1 138:8.10 long (11) 9:24 42:11 50:21,23 77:16,23 117:1 141:21 167:8 173:2 213:16 longer (1) 49:3 longevity (1) 136:14 look (125) 3:11 4:4 6:1,20 7:21 8:21 9:22 11.18 12.17 17.12 20:17 25:1,8 26:1 29:11,24 31:9,10 32:2,3,3,4,7 35:20 36:18 39:7 41:5 42:17 45:4 49:9 51:21 52:9 53:5 58:13 59:3 60:4 62:16 63:24 64:11.13 66:17,18 68:7 70:6 74:14 78:13 81:1.22 82:3 83:7 84:13,22 86:8 92:15 93:15 94:15 96:5 97:9 102:22 103:14 104:5

105:18 25 107:24

109:8,10 110:14

117:2,4 122:1 124:23

127:1,12 128:7 134:15

140:24 144:21 145:2.8.10.12.16.17.21 151:15 153:2 160:10 161:16 162:13 164:14 166:25 167:6.12 168:11 169:11 172:17 173:20 174:17 176:2,4 177:3,15,16 178:10,12,13 179:7,8 180:12,23 182:5 183-19 184-22 186-13 189:25 194:9,10 195:7 196:7.24 197:6 198:19 201:4 203:20,22 looked (24) 13:8 56:22 58:23 64:11 87:1.7 92:19 93:11,12 104:3 111:8.15 113:19.20 118:14 122:8 126:8 127:9 141:14.18 161:17 166:14,22 174:8 looking (43) 5:2 6:18 15:3 17:20 26:14,23 27:12 38:17 40:9 43:17 47:13 48:2 54:21 58:21 60:25 61:16 69:4 70:24 86:10,13 91:21 92:24 100:20 102:9 107:19 112:23 113:3.9 124:10 125:4 128:3,5 141:23 168:7 177:22.24 180:6 186:17 187:17 199:24 203:16 206:2 207:15 looks (1) 120:2 loop (1) 43:9 loosely (1) 49:24 lot (14) 5:10 8:15 13:11,15,16 18:4 45:24 49:3 76:6.8 137:14 183:23 190:19 205:16 lovell (1) 44:8 lovely (1) 150:15 low (3) 12:11 208:10 209:2 lower (1) 184:12 Itd (3) 3:13,22 70:18 lucy (1) 200:20 lunch (1) 120:9 М m2 (1) 60:9

main (20) 23:19 38:1 39:21 53:18 54:15 58:6 60:15 61:19 65:20.21 69:14 103:17 124:4 160:5 197:10 198:1 204:3 205:5 208:14 209:10 mainly (2) 21:4 44:23 maintaining (1) 202:8 maintenance (1) 118:5 makes (3) 138:11 196:12 197:16 making (14) 16:1 19:18 34:3.4.4 39:7 61:17 66:8 80:15.20 141:8 185:9 186:1 209:12 manage (2) 58:21

180:16

management (2) 20:21 45:19 manager (27) 15:19,24 16:9.11 19:16 20:13 33:24 41:14 45:12 55:14 56:14,16 58:20 73:1,24 80:11 108:23 175:1 185:18 202:1,4,5,7,7,10 204:19 209:9 managing (3) 56:15,19manner (1) 193:22 manufacture (2) 69:22 187:12 manufacturer (3) 70:18 71:1 140:5 manufacturers (3) 59:7 103:7 154:17 many (8) 23:23 37:8,15 43:16 64:3 65:2 77:3 183:18 march (5) 67:11,22 81:25 146:6 152:24 mark (45) 3:16 14:24 15:24 23:14,17 24:22 25:2.23 28:8.10 29:15,17 31:11 32:2 38:13,23 40:21 41:8 43:4 44:13 45:7,7 55:8 64:21 65:7 106:6 110:18,21,23 111:4,4 113:25 144:2 151:20 157:17 174:20 175:10,13,17,23 181:4 183:22 184:8 186:22 202:10 marked (7) 33:1 188:24,25 189:21 195:19 198:7 201:17 market (1) 121:23 marketed (1) 78:9 marketing (2) 104:13 121:19 marks (2) 111:10 113:22 marley (3) 99:4.8.19 martin (48) 1:3,8,10,12 2:10,13,18,22 3:1,3 17:14 57:1.3.10.17.20 73:12,19,23 74:1,3,6 120:6,8,20,23 125:7 126:21 133:5,8,17,21 166:2,6,9,17 173:12,18 174:2,4 207:13 209:16 20 213:12,15,19 214:8,13 masonry (2) 90:17,19 match (1) 151:6 material (17) 15:1,4

133:19

24:1 27:10 35:24

36:6,10,13 69:24 70:2

72:15.21 89:15 97:1

169:14 170:10 208:7

38:21 39:4,9,11 60:10

62:22 64:5 65:4,11,15

73:10 78:11 177:24

193-5 205-9 14

mathematical (1)

matrix (6) 202:21

materials (21) 6:13

13:13,21,25 14:5

62:4,14,21,23

164:7.9

170.11

neal (1) 45:13

nearly (1) 169:1

necessarily (8) 19:2

45:1 47:22 105:3

necessary (9) 135:24

163:2 164:18,24

136:3.9 137:7 138:13

129:2 152:11 169:15

63:10.20 66:16

67:7,12,17 70:5,8,21

107:25 141:15.17.19

203:3,7,12,14 207:7
matter (1) 160:2
matters (1) 80:22
max (2) 22:17 119:13 maxwell (5) 43:4 53:15
175:10 181:5 186:22
maxwells (1) 45:4
maybe (6) 63:15 64:1 77:7 106:22 147:9
186:24
mean (36) 5:11 36:23
40:14 46:21 52:25 71:23 72:13 73:8,14
76:6 77:10 81:8 87:11
89:2 91:19 105:11
107:9,19 112:14
118:11 120:2 123:13 126:21 128:24 129:2
136:3 142:2,16 166:1
177:11 184:12 185:12
186:3 190:19,19 191:21
means (3) 107:6 164:23
191:13
meant (9) 89:10,12
90:10 91:20 92:10 93:1 95:25 137:3
166:10
meantime (2) 75:12
211:18 mechanical (1) 11:23
mechanisms (3) 4:23
8:22,25
media (5) 68:18
69:3,5,24 71:3 meet (10) 33:21 47:14
50:3 75:7 124:22
126:4 129:19 132:7
133:16 149:25 meeting (35) 1:21 2:6
3:6,25 4:5,18 5:3 13:1
22:18 23:2,4,7
28:17,23 45:13 49:11,15,17
49:11,15,17 50:9,11,12 52:4 53:17
110:12 116:21,22,23
117:3,5 142:21 179:15
180:19 207:15,17 208:22
meetings (3) 33:23
78:21 116:19
meets (2) 90:24 95:13 melt (2) 5:25 12:13
melted (1) 12:11
member (1) 4:1
members (8) 1:21 2:5
3:6,10 13:1 39:11 141:6 174:25
membership (1) 1:20
memories (1) 10:2
memory (14) 2:20 5:5 68:13 69:23 71:1,10
88:15 95:5 100:20
128:6 172:15
176:24,25 189:25
mention (2) 91:23 180:18
mentioned (3) 11:9
95:4 134:1
mentioning (1) 99:22 merely (2) 128:19 145:9
mermoz (1) 8:1
messy (1) 182:8

met (5) 3:25 13:5 22:21 93:13 126:22 metal (2) 195:10,16 meterssic (1) 83:17 more (47) 10:7,16 method (2) 10:17 95:12 metre (1) 209:22 metres (37) 76:20 79:3,5,12,16,21,25 80:8,14 83:24 84:4,10 87:19 88:3,8 89:24 90:6.8.11 91:9.13 95:8,15 102:5,15 103:20.23 114:20 132:6 134:6,11,13 139:17 142:19 143:9.20 154:5 middle (4) 8:19 44:23 98:23 199:4 might (38) 5:13.16 6:8.13 9:6 27:13 56:6 63:11,14 76:4 77:4 106:17 112:20 119:3 123:18 125:7 126:13 128:1 129:14,16 131:16.19 134:24 137:15,15 142:24 143:16 147:24 155:16 162:9,14 172:12 175:23 184:21 192:24 201:22 203:12 213:16 mike (7) 23:16 25:23,25 29:16 31:12 174:21 200:20 millett (1) 62:20 mind (9) 8:9 38:19 99:25 100:2.6 119:7 121:15 171:9 181:23 mineral (1) 119:2 minimal (1) 55:5 minute (1) 47:20 minutes (8) 116:20.21 117:2,5 119:8 120:1 173:11 207:16 misleading (1) 92:25 mistaken (2) 49:20 63:17 mix (3) 13:11 111:10 113:22 mock (2) 30:2 31:3 mockup (7) 11:15 28:15 29:8,9,11 31:7 32:4 mockups (1) 208:6 model (3) 181:24 199:5 200:16 modify (2) 181:8,14 modifying (1) 20:25 mods (1) 192:10 moment (12) 17:15 56:25 84:21 97:3 120:5 140:12 146:25 149:2 173:9 177:4 203:19 213:10 names (1) 207:20 monday (2) 26:1 28:19 narrow (1) 15:7 month (1) 172:21

120.2 122.9 123.14 23 125:24 126:10,25 132:4.5.22 133:8 136:21 168:2 172:10 173:16 176:2 177:22 180:12 185:1 198:13 202:5 203:21 213:24 morning (24) 1:3,8,9,16 13:9 22:19.21 33:4.14 52:5 58:1 82:9 83:2 109:13 122:12 127:10 134:17 144:24 174:23 197:11 213:14,17 214:4,11 most (12) 68:15 87:12 93:2 122:19 123:2,3 131:23.25 132:3.15 133:25 134:3 move (4) 29:4 172:16 173:10 181:19 moved (1) 144:2 moving (2) 28:6 29:13 ms (39) 1:13.15 2:11,17,20,25 3:2,4 17:24 56:24 57:2.21.22 74:7.8 120:4,7,24,25 125:16 127:3 133:5,7,22,23 166:18 173:8,17 174:5,6 207:8,14 209:24 213:9.13.17.25 214:11.12 msc (4) 8:14 63:15 68:1 178:8 much (16) 1:12 3:1 5:11 6:18 54:7 57:20 68:2 112:22 120:23 137:1 158:4 181:21 183:3 210:1 214:8,13 must (15) 47:14 61:4 81:14 89:25 92:19 95:4 107:20 113:12,25 117:18 128:4 130:1,7,8 170:6 myself (3) 49:2 50:19 137-21 N name (5) 3:13 40:22 107:8 121:7 175:2 named (1) 41:1

national (2) 94:21

natura (3) 99:4,8,20

nature (4) 15:9 48:16

nbs (28) 27:20 36:11

39:5 57:24 58:3,4

59:13 60:15 61:12

natural (3) 132:22

137:5 145:15

88:4 96:4

131:16

months (2) 20:11 208:6

2:10,13,18,22 3:1,3

17:14 57:1,3,10,17,20

73.12 19 23 74.1 3 6

120:6,8,20,23 125:7

126:21 133:5,8,17,21

moorebick (48)

1:3,8,10,12

166:2,6,9,17

173:12,18 174:2,4

207:13 209:16.20

213:12,15,19 214:8,13

14:23 15:23.25 16:4

26:22 31:16 46:12,24

63:15 68:8 72:9 77:12

112:22 114:19 119:3

48:21 49:2 56:1,3

78:1 89:16 98:8

165:19 need (25) 18:21 20:3 25:16,18 28:12 39:7 43:16 45:8 46:10 94:12 97:14 105:24 111:16 117:21 155:11 160:17 161:21 165:7.14 167:16 169:1,18 192:11 209:17 213:13 needed (13) 15:25 19:1,3 40:22 45:18 56:2 87:14 97:21 126:6,10 135:10 165:4 202:16 needing (3) 46:9 136:21 152:2 needs (7) 106:9 107:3.10 108:3.8 151:21 182:14 negative (1) 148:21 negotiations (1) 208:7 neil (52) 32:13 33:6,16 155:4 158:16 159:4,9 160:14,15 161:3,4,10 162:19,21,23 169:5,13 171:20 183:23 184:4 186:21 187:18,25 188:6 189:10 190:18 192:7,10 193:13 194:14,21,24 195:1,8 196:1,15,16,16,21 197:8.16.18 198:7,9,14,22,23 200:6,10 201:4,5,7 network (2) 140:10 144:7 never (16) 16:3 27:5,6 47:21 56:2 63:19 78:16 115:15 139:15 159:10 173:2,3,3 188-10 211-5 212-17 next (20) 6:25 7:21 9:17,23 13:4,10 22:9 38:6 43:24 49:16.18 69:20 82:2 163:20 186:23 187:6 191:7.20 201:6 205:5 nobody (1) 56:13 noncombustible (6) 13:13.21 14:1.5 169:15 170:11 none (2) 125:8 135:3 nonmember (1) 3:21 norm (1) 203:10 normal (9) 35:11 47:19 88:18 152:5 153:11 193:1 201:15 202:21,25

note (10) 91:4 110:17 119:9 146:16 147:12,17 148:10.17.20 186:25 noted (3) 29:8 59:7 85:3 notes (3) 37:20 90:15 146:23 nothing (2) 35:24 132:12 notice (7) 90:7 95:2 96:24 97:1 99:13,16 101:7 noticed (1) 95:5 noticing (4) 70:21 92:5 96:13.16 notify (1) 146:7 noting (1) 90:2 november (10) 23:13.15 109:22 110:7.9.13 181:3,4 200:7,19 number (24) 1:18 7:2 9:21 12:22 13:5 22:16 23:1 31:5 40:6 41:9 76:17 77:1.24 86:17 107:12 139:21 149:20.22.23 160:18 198:21 200:1,7 207:17 numbered (1) 35:18

0 objectives (1) 4:21 obligations (1) 21:23 observations (1) 32:25 obtain (2) 72:2 73:16 obviously (2) 85:10 occasional (1) 2:23 occasionally (1) 19:19 occur (2) 193:22 194:4 occurred (2) 80:12 171:4 occurring (1) 71:10 oclock (5) 120:10,13,16 214:4,11 oconnor (1) 155:4 october (11) 1:22 2:6 3:6 4:18 11:8 12:23 106:10 116:20,22 198:20 199:19 offer (2) 212:2,4 offering (3) 132:6 151:6 office (24) 15:24 41:13 44:19.20.24.25.25 64:8,10,17,18,18,21,21,23 65:7,10 66:25 75:10.24 76:7 106:20 149:13 185:23 officer (5) 82:24 129:9 155:12,23 171:3 officers (2) 155:16,17 offices (3) 44:22 76:16 77.1 official (2) 187:10 192:11 officially (1) 41:16 offline (1) 105:24 often (6) 18:1 55:17 78:1 88:5 136:25 152:8 oh (1) 151:10

okay (37) 10:14 18:16 30:25 31:19 37:2.5 47:25 62:21 66:15 68:6 77:9 81:1 88:12 89:19 91:25 92:21 93:14 94:13 95:7 102:20 105:5 110:11 113:17 120:4 146:12 152:15 155:24 162:4 166:17 173:8 176:1 177:3 183:16 188:12 198:6 202:19 210:22 old (1) 35:19 once (6) 19:21 20:13 64:11,13 133:8 150:24 oneoff (1) 182:24 ones (4) 35:19 78:15 103:17 175:13 onesided (1) 13:12 ongoing (1) 123:20 online (1) 90:1 open (1) 44:8 openplan (1) 44:20 opinion (11) 13:11,12 155:12.16.17 157:22 158:6 164:22 165:21 166:4 204:6 opinions (1) 14:13 opportunity (1) 201:23 opposed (1) 35:18 option (1) 27:2 options (1) 153:24

107:21

48:9 49:9 95:23

130:10 201:21

output (1) 10:23

overly (1) 78:12

owe (1) 20:24

160:1

144.6

order (9) 28:1 33:25 47:20,22,24 106:12 126:12 146:4 160:19 ordering (1) 193:5 organisation (1) 88:25 organise (1) 173:16 original (2) 9:3 38:2 originally (2) 39:1 originating (1) 9:11 osborne (2) 151:20,24 others (11) 23:16 28:9 162:21 186:10 192:7 195:24 197:8 198:21 otherwise (3) 114:8 ought (6) 100:1 117:4 135:10 141:5 143:12 ourselves (1) 73:5 outside (3) 91:7 140:10 over (44) 33:2 37:8,15 43:6 53:9,13 54:4 56:22 76:20 77:7 79:3,5,12 84:10,20 88:8 90:11 91:13 98:4 100:9 103:20.23 114:20 120:12 127:1 132:6 134:13 135:20 142:19 144:2 153:24 160:13 181:7 183:14 186:18.22 187:6 191:19 193:1 195:16 201:6 205:7,16 214:6 overall (2) 32:7 209:22 130:18.19 140:19 144:17 overview (1) 208:1 passing (14) 6:4 16:24 17:2,10,16 18:11

own (11) 44:25 50:23 59:2 130:13 157:12 166:4 173:6 184:25 185:25 186:3 202:13

p1 (1) 38:1 p2 (3) 37:7,10 38:9 pack (9) 14:16 86:16,22 89:15 92:13 98:21 105:19 127:5 9 package (1) 175:11 pages (1) 63:25 panel (10) 36:25 37:10 38:9,16 60:16 96:22 99:4,8,20,23 panels (21) 6:18 9:15 24:14 25:5,7 36:22,22,24,24 38:1,2 60:13 68:21 96:12,22 97:1 208:14,24 209:10.18 210:7 paragraph (41) 13:4,10 23:18.20 25:9 35:14.16.21 36:19.21 37:6 39:17 40:9 42:13 43:13 44:4 48:2 49:10,14 68:10,11 69:20,20 76:12 90:14 91:18 97:11 98:11 100.23 102.23 103.14 128:8 129:18 142:10 177:17 178:13 203:20,23 205:3,5,7 paragraphs (2) 25:9 128:8 parapet (2) 195:11,15 paraphrasing (1) 171:7 pardon (2) 74:20 151:10 park (1) 20:18 part (44) 3:19 5:18 10:19.22 17:24 18:8,20 21:11 27:16 30:7,9,11,15,17,18,19 31.14 54.22 58.5 64.4 65:3,7,9 66:7,11 71:18 73:1 74:8 76:19 118:7,15,17 122:22 128:11,14 138:8,10 140:7 157:19 168:1 169:7.21 174:8 208:15 particular (11) 9:19 48:17 64:6 65:5.12.15 73:6 89:25 118:18 129:9 155:22 particularly (1) 211:8 parties (2) 102:25 118:7 parts (8) 51:8 58:18 130:1 157:4 167:25 174:11 184:23 204:16 parttime (1) 183:5 pass (13) 14:21 16:17 17:4 19:20 87:4,5 88:13 104:17 105:5 127:1 142:24 145:9 passage (2) 17:12 63:24 passed (10) 11:10 17:8 87:15 94:22.25 128:23

67:13,24 68:4,14

71:10.19 72:20

74:19,22 78:9 79:6,20

88:17 92:23 93:8 94:4

80:11 82:11 85:21

58:11 73:5,13
105:7,9,11 130:12
176:25 past (1) 18:3
paths (3) 168:22
171:19,24
pause (6) 2:15,24 57:12
120:15 173:22 214:10 pe (6) 209:3 210:7
211:21 212:4,22 213:5
people (27) 11:9,12
13:5,15 14:4 46:12 51:19 72:12 87:5
91:22 93:3 104:17,25
105:6,8 127:2 129:16
137:14,21 142:13
146:7 149:6 155:20 166:18 171:11 172:8
200:7
peoples (2) 103:22
104:2
per (8) 11:15 28:24 60:9 82:12 153:5
188:20 197:10 209:22
perceive (1) 204:14
perceived (1) 204:12
percentage (1) 183:12
perform (1) 5:21 performance (59) 5:21
10:25 11:23 12:7 32:8
59:19,22 64:5
65:4,11,24 68:22
69:11 72:15 73:9 75:7
80:21 94:16,18 97:12 98:9 100:4,5,6 107:16
112:9 116:16 118:16
124:19 125:18,19,21
126:4,16,17
132:9,13,16 133:11,18
134:2 135:1 136:8,12,13,16,17,19
137:3,8 140:8 149:7
154:6 165:21 168:8
180:3,7 204:20 210:16
performancerelated (1)
125:12 performances (1)
204:18
performing (1) 89:17
perhaps (1) 2:13
period (5) 16:11,14 92:24 177:10,11
92:24 177:10,11 person (11) 4:6 26:8
46:3,12,25 47:14
121:14 128:16 144:1
147:9 172:24
personally (5) 104:8,12 138:11 176:21 179:21
perspective (3) 118:22
136:23 173:6
perspectives (1) 118:22
persuade (1) 136:22
phase (1) 41:17 phenolic (5) 68:22
69:10,15 88:3 103:16
phenomenon (1) 9:4
phone (2) 33:3 49:23
photographs (1) 11:16
photos (2) 122:20 128:9 phrase (2) 40:11 139:3
pick (7) 43:3 62:19 64:1
84:12 121:25 174:6
177:17

picked (1) 67:16 picking (2) 5:19 15:12 pictures (1) 7:10 piece (2) 92:18 106:20 pink (9) 76:21 78:23 87:8,10,11 91:8 93:18,21 98:3 pipeline (1) 109:16 pir (6) 69:14 75:6 89:6,7,8,10 pitch (6) 76:19 79:4,6,15,20,24 place (8) 19:7 52:19 53:1 55:13 110:13 155:21,22 176:14 places (1) 67:6 planners (2) 208:8,11 planning (4) 54:5 207:25 208:1.10 plans (1) 160:7 played (1) 36:12 please (45) 1:6 25:3,11 52:5 57:5,11,13 75:13 82:10 83:3 84:21 109.14 120:10,11,13,16 123:1 140:12 147:2.21 148:14 155:9 156:10 161:7 173:19,23 174:24 180:15,24 182:9 184:5 187:8,10,21 189:14 194:15 195:3 196:2.19 198:24 199:22 200:11,25 214:5,9 pleasure (1) 75:5 **pm (5)** 120:17,19 173:24 174:1 214:14 pmn (1) 119:9 pointed (3) 22:24 94:2 95:20 pointing (1) 161:13 points (7) 12:16 13:19 15:12 23:1 29:23 204:17 205:4 policy (1) 73:7 polyethylene (5) 209:3 210:7,12,15,17 polyisocyanurate (2) 69:16 89:12 portrayed (2) 128:5 205:3 position (7) 103:5 168:20 169:2 171:17,21,22 206:19 positioning (1) 35:25 positive (5) 9:12 28:17 35:8 148:19 206:17 positively (1) 139:6 possible (8) 28:20 49:20 53:24 54:3.18 116:24 148:2 168:25 possibly (1) 209:20 postmeeting (1) 119:9 potential (1) 23:6 potentially (4) 44:8 113:4 170:13 181:2 practice (5) 14:17 184:15,17 201:16,21

24:4,5,8,10 36:10 preliminariesgeneral (1) 59:5 preliminary (3) 33:8,9 178:19 premier (1) 146:22 prepared (1) 81:12 preparing (1) 20:25 prescriptive (12) 59:20,23 60:3 61:1,3 73:15 93:10 116:16 119:6 124:20 125:13.13 present (14) 2:7 5:6,13,15 23:3 28:23 29:1 33:23 75:11.22 76:9,10 117:8 207:18 101:23 presentation (10) 5:3 6:20 7:1.8 9:20 10:15,20 76:3,4,11 presented (1) 78:24 presume (1) 117:19 pretence (1) 52:23 pretty (2) 13:12 15:4 prevent (2) 160:19 169:18 previous (8) 40:10 78:4 112:2,3,10 155:19 190:21 196:9 previously (9) 48:7,13 60:21 66:12.13 103:3 111:15 130:3 210:19 price (5) 81:8,15 150:25 151:6 153:5 pricing (1) 201:20 primarily (1) 185:15 primary (1) 40:1 print (1) 184:21 printed (1) 190:6 prior (11) 22:11 23:10 36:7 69:4 72:24 88:1.5 110:9 183:19 184:24 privacy (1) 135:5 probably (28) 5:10 8:14 15:15 32:2 34:4 49:25 57:25 58:23 85:23 87:13 93:12 94:1,1 104:16 117:4 123:15 124:4.18.21 125:20 126:5,16 128:16 130:14 136:12 182:17 184:12 213:9 problem (1) 43:18 problems (3) 45:24 46.15 151.23 procedures (1) 52:18 proceed (7) 53:24 184:25 187:11 192:12 193:1,14 208:12 process (30) 18:5 21:11 22:11 27:17 48:24 62:3.13 68:8 118:20 119:19 132:17 176:3,5 182:15 185:2,5,7,13,19 186:5,10,14 188:8 193:1,17,18,21 194:1,6 203:21 processes (2) 53:1 176:14 produce (1) 46:1

174:15 176:22 179:22 producing (5) 17:3,7,9 32:4 34:5 product (108) 37:8,15 39:2 60:22 61:4.7.25 64:12,13 69:13 70:14,23 71:5,6,15 75:11,18,23 76:1,10,17 77:4 78:22,25 79:9 80:2.4.13 81:13 82:1,16,21 83:22 84:10.20 85:24 86:5,9,17,18,19 87:18 88:2,7 90:10 92:1 94:10 99:9.10.14 102:2,3,4,7,14,15 104:14 107:8.15.21.23 108:11.18.22 109:3,4,6 112:24 114:6.8 115:12.24 116:3 118:21 119:2,2 126:4,7,9 129:18 131:20 132:6.13 135:1 136:22 138:15,16 139:16 140:25 141:13,17,18 142:18 143:20 149:17 153:4,4,24 163:15 164:6.8.11 171:1.12 172:6 173:3 209:1 products (34) 58:24 61:1 62:22 64:8 66:1,8 69:1,2 70:3 78:10,18 101:17 102:9 106:21 107:12 112:20 113:11,15,16 119:7 121:20.23 133:9 140:7 146:24 149:25 151:8 153:10 154:12 168:8.8 169:16 170:11 210:20 professing (1) 157:2 professional (1) 78:3 professionals (1) 124:9 profile (2) 121:5,12 programme (20) 16:1 19:19 34:3 46:18,20,24 47:13,15 50:2 55:20.24 56:3 58:22 61:18 80:16,21 186:2 202:6,9 209:13 programmes (1) 16:2 progress (1) 33:25 project (189) 9:5 16:23 19.9 10 16 17 20:13,13,22 21:6,9,12,13,14,17,21,22 22:12,18,22,23,24 27:7,19 33:19,25 34:23 35:23 36:5 38:22 39:14,20,24,25 40:3.13.16.23 41:2.14 42:6,8,17,19 44:16 46:5,23 47:4,18 48:5,6,10,20 49:1,18,19 51:1 52:6 54:12 55:2,5,14,18 56:5,11,14,18 57:24 58.5 6 20 59:2,13,19,22 60:2 61:20 62:11 64:6,14

95:22 108:11,14,23,23 110:19 111:17 112:14,17,25 113:7 114:17 115:1,8 116:5,15 118:19 119:4 123:7.12.19.20 124:7,9,12 125:3,6 126:13 131:6.13 132:18 139:8 140:11,20 141:6 144:8.9 146:11 149:19 150:8,22 151:5 152:17 153:13 154:3 158:22 160:3 171:10 172:20 173:1.4 175:1 176:4,6,9 177:2.6.9.13.14 182:14 183:4,17 185:18 186:6 189:8 190.3 191.5 192.8 193:19,20 202:2,7 203:2.8.12.15 204:22 206:2,6,14 209:9,11 212:1,25 213:6 projects (62) 10:10 11:11 16:17 18:10 19:4.11.23 20:11 21:5 23:23 34:24 40:4.6 48:14.16.18 62:7.10 65:13,16,21 68:16 72:16 78:4 79:1.17 80:9 85:19 87:5 109:15,25 110:22 112:19 114:21 116:6,10,12 123:16 124:19 132:8.25 133:2,10 134:9 146:20 149:21,23,23 150:2 154:9,17 160:4 164:12 185:10 201:15 202:20,25 203:9 209:14 210:19 211:22 212:1 projectsite (1) 45:12 promote (3) 6:13 116:11 150:2 promoted (2) 15:19 149:16 promoting (3) 116:9 150:5 153:24 promotion (1) 121:20 prompt (3) 118:20 140:24 171:9 prompted (1) 45:15 proper (1) 20:4 properly (2) 56:10 191:19 proposal (1) 139:13 proposals (1) 174:9 propose (1) 150:2 proposed (7) 43:17,22 52:10 81:19 115:13 129:6 159:20 proposing (4) 32:22 114-13 149-20 22 provide (12) 26:9 28:20 83:16 115:11,22 127:18 129:23 142:9

160:18 161:22 167:16 204:21 provided (16) 7:3 15:13 29:9 60:6 61:7,11,13 83:9 98:2 135:10 139:2,21 140:16 145:18 160:7 163:24 providing (4) 33:24 34:2 51:10 127:24 provision (1) 129:13 ps (1) 84:25 pt7 (1) 122:24 publication (1) 11:4 pull (8) 2:7 18:18 45:12 62:17 76:13 99:1 163:11.19 pulled (2) 40:1,13 purpose (1) 85:13 purposely (1) 175:3 pushed (1) 47:12 pushing (1) 103:20 putting (4) 112:5 114:22 125:10 126:4 puzzled (1) 30:14 Q

q (760) 1:24 2:4 3:9,16,19,25 4:4,9,21 5:5,13,19 6:12,19 7:12,17,20 8:8.12.17.20 9:12.16 10:2,7,14 11:4,13,18 12:5.14 13:19.24 14:4,9,15,25 15:3,7,12,19,22 16:5.14.23 17:7.11 18:7,14,16 19:15,25 20:2.8.15.24 21:6.10.14.18.22 22:1.5.9 23:6.12 24:4,9,12,17,24 25:21 26:4.8.13.21 27:1,6,9,13,18,24 28:5.23 29:5.8.13.21 30.6 11 14 18 21 31:1,9,16,19,25 32:6.8.11.17.20.22 33:12.18.21.24 34:6,12,17,22 35:3,6,8,14 36:3.9.15.18 37:3,5,14,25 38:6.9.12.15.25 39:6,12,14,16 40:9,17,19,24 41:5.22.25 42:2,7,10,19,23 43:15,22 44:4,13,18 45:1,4,12,22 46:3,7,21 47:2,6,16,25 48:13,16,21,23 49:7 50:7,10,15,17,24 51:4,11,16,21 52:9,18,25 53:3,5,13,22 54:11,16 55:1,4,7,11,15,22 56:5.9.13.17.22 58:9,12,17,24 59:4.12.21 60:1.4.15.19.21.25 61:10,19,22 62:2,11,16 63:8,17,19,22,24

66:4.6.11.15 67:6,16,19,21 68:3.6.25 69:7.10.18.20 70:10,17,21,25 71:5,10,14,18,23 72:7,13,20 73:8 74:13,21 75:1,18,22 76:4,9,12,25 77:3.9.16.21.23 78:3,6,8,16,21 79:4.9.11.14.19.23 80:6,11,18 81:1,6,12,16,21 82:8.20 83:7.20 84:2,6,9,12 85:7.10.20.25 86:2.4.10.14 87:7.10.16.25 88:10,12,16,20 89:2.4.10.12.14.19 90:4,10,14,22 91:4,10,14,18,25 92:5.7.12.15.21 93:5,14,23 94:4.7.9.13.25 95:7,18,24 96:4,11,19,21,24 97:3,9,18,21,24 98:7.20.23 99:7,10,13,17,22,25 100:8.16.20.23 101:7.10.12.18.22 102:2,13,20 103:11,14 104:1.8.12.19 105:7,11,17 106:5,15,24 107:1,6,9,14,19 108:1,7,10,13,16,20,24 109:1.6.8.21 110:5.11.25 111:2,4,6,14,19,21,24 112:7,14,22 113:5,14,17 114:2,5,11,15,24 115:6.11.17.22 116:1,9,13,18 117:2,11,13,16,20 118:4.11.15.20 119:1,8,12,19,22,25 121:9,12,15,18,22,25 122:8 123:7.17 124:1,6,13,15,17,23 125:24 126:8,15 127:15 20 128:1,7,18,22 129:5,12,17,22 130:4.8.16.20.25 131:4,10,14,16,19,22 132:12.22 133:3 134:7,14,24 135:8,17 136:2.7.15.19 137:5,11,17,23 138:2,4,7,12,18,22 139:1,15,19 140:16,19,24 141:5,12,17,21 142:2,6,8,15,23 143:1.3.11.18.24 144:5,13,15,19,21 145:8,15,23

65:1,19,22

precise (1) 130:9

predict (1) 112:12

predicted (1) 112:6

preference (6) 23:22

produced (4) 35:4

65:5,12,19,23

146:2,4,12

147:6,12,15,19
148:2,9,12,22,25
149:9,12,15,20
150:1,5,7,13,21,23 151:4,7,10,13
152:2,8,15,21,23
153:2,8,12,17,19,22
154:9,13,16,20
155:8,15,24
156:2,8,14,23 157:1,11,14,16,19
158:1,3,5,10,14,19
159:7,17 160:1,7
161:2,13,15,19
162:1,4,9,13,18
163:6,18,24 164:3,8,14,21
165:5,12 166:25
167:4,8,22 168:2,11
169:11 170:1,7,18,23
171:5,13,17
172:3,5,10,16 173:5 174:11,15 175:9,20,23
176:1,14,21,24
177:3,8,11,15
178:3,10,18,25
179:4,6,21 180:9,12
181:2,14,18 182:5,12,22
183:3,11,16 184:3,15
185:1,12,17
186:3,8,13
187:5,15,24
188:3,6,8,12,19,24 189:8,13,15
190:2,6,12,15,22
191:4,8,14,18
192:1,3,15,19,23
193:8,17,21,25 194:9,19,23
195:1,7,14,19,21
196:6,12 197:4,16
198:2,4,7,19
199:3,7,14,18
200:4,15,24 201:16,22 202:1,19
203:1,6,11,14,17
204:10,20,24 205:5,24
206:4,7,12,16,21
207:1,23 208:18
209:1,7 210:5,9,12,15,23
211:4,6,9
212:10,13,17,21,25
213:4
qualifications (3) 50:12,18 175:4
qualified (1) 93:2
ualify (1) 79:5
<b>quality (3)</b> 52:18,25
202:14
<b>quantities (3)</b> 81:10 112:19,23
quantity (3) 111:15
153:5 172:19
quartz (1) 60:12
queried (3) 139:7 162:7 165:13
105:13 queries (1) 26:10
query (5) 83:21 101:12
156:9 162:4 203:2
question (25) 30:16
31:13 62:21 63:2,4

64:3,16 65:1 80:10 93:5 102:24 103:21 115:4 123:7 133:6,24 156:1 165:7.9 171:4.15 189:19 193:24 198:12 201:11 questioning (1) 65:1 questions (19) 1:14,18 2:18 5:1 37:16 39:16 57:23 127:7 163:6 168:2 170:19 173:11,16 185:2 203:18 207:8 211:19 213:24 215:3 quick (2) 107:24 196:7 quickly (4) 53:23 54:3,17 133:15 quite (10) 12:11 18:1 47:18.19 75:25 76:8 77:9,15 87:16 180:16 quotation (4) 51:21,23 52:5 152:16 quote (1) 152:23

R rail (1) 68:20 rails (1) 25:16 rainscreen (30) 12:6 25:5 58:15 66:18 68:21 75:8 78:25 82:12 84:20 85:7 86:20.21 89:23 90:5,17 93:16 94:19 96:22,25 97:25 99:10 114:12 128:25 136:14 160:17 161:21 163:15 208:18.24 209:10 raise (4) 150:25 171:13.15 172:11 raised (2) 47:18 143:16 raising (1) 205:13 range (2) 121:23 136:11 rated (1) 94:20 rather (7) 45:21 50:4 59:20,23 68:14 124:20 125:12 rating (4) 122:24,25 169:14 170:10 ray (21) 19:20,24 20:1,2 23:16 34:4 43:5 44:25 45:7 49:11 50:3,6,7 55:14 56:22 62:20 102:21 157:17 178:16 183:22 184:22 reaction (3) 161:23 170:2,7 read (27) 58:19 59:5 69:24 72:17 87:11 90:14 92:12 93:23

94:4,9,12 97:21

101:10 104:5,19

140:16,23 147:16

159:23,24 161:15

191:11,14 203:24

reading (22) 31:18

67:16 68:18 70:11

97:18 98:5 100:13

120:2 127:3 130:20

132:23 137:5 145:16

86:24 91:18 95:18.19

170:16 189:1

207:23

reason (8) 13:3 47:10 125:10 132:14 134:1 138:18 153:23 201:19 reasonably (1) 204:21 reasons (1) 154:2 reassure (2) 39:25 reassuring (1) 40:25 recalculate (1) 106:11 recall (31) 13:24 15:20 23:3 28:25 33:18.20 37:3 48:24 49:22 66:6 68:3 69:6,8 81:17,20 86.24 91.10 95:18,19,19 98:5.20.22 106:19,19,24 113:23 119:22 147:9 170:2,4 receive (3) 150:1 151:7 153-25 received (3) 27:19 144:16 149:3 receiving (1) 177:14 recent (1) 7:25 recently (1) 12:25 rechecked (1) 117:22 recognise (2) 99:15 132:2 recollection (9) 7:17 29:5 50:15 69:1 76:9 104:6 108:5 141:22 recommending (1) 133.9 reconsider (3) 131:5 143:12 170:24 reconsideration (1) 171:9 recorded (4) 10:22 23:1 108:3 120:1 recording (1) 31:5 recruit (1) 46:13 recurrent (1) 182:24 red (6) 37:22 38:6,12,16 188-17 195-11 reduce (1) 181:9 refer (5) 26:4 64:17 72:18 124:25 162:16 reference (12) 7:22,24 9:2.23 10:25 11:19 35:17 46:8 66:24 70:14 89:8 95:2 references (1) 46:7 referred (5) 7:8 67:6,7 168:10 206:11 referring (9) 66:4 137:23,23 150:21 151:4,25 162:10,15 205.24 reflect (1) 166:9 refurb (1) 106:7 refurbishment (1) 71:16

147:23 162:25 164:16

165:17 192:2

120:20 174:2

126:10

158-13

ready (4) 1:10 57:17

realise (2) 69:13 102:18

realised (3) 21:2 125:25

really (9) 27:17 33:16

37:4 47:12 78:20

88:10 136:10 157:25

regarding (14) 41:17 45:15 109:25 110:21 134:19 147:2.21 148:14.23 168:21 171:23 195:10 211:14,20 regardless (2) 90:11 204:11 regards (14) 33:5 75:14 85:1 109:17 110:1 145-4 159-3 13 160-23 161:9 169:4 179:17 180:20 196:20 regeneration (1) 158:21 registered (1) 88:21 regs (1) 21:16 regular (1) 176:8 regularly (3) 88:2 177:5.9 regulations (19) 16:16 20:19,21 21:1.2.8.20.24 22:1.7 34:10 51:12,17 61:15,25 94:21 133:20 162:11 180:6 regulatory (2) 61:14 62:5 reissue (1) 196:8 rek (1) 23:15 related (3) 69:24 101:4 106.3 relates (2) 97:13 155:9 relating (5) 11:14 100:4 158:23 161:7 175:24 relation (21) 14:2 21:16 64:5 65:4.11 73:14 76:15 80:25 82:5 103:7 114:18 123:7,22 142:20 150:8 153:3 159:1 168:20 171:18.22 204:25 relationship (9) 44:7 78:4 112:2,10,11,15 149:9,15 212:5 relevance (2) 92:7 166:20 relevant (16) 50:12 61:14 62:5,25 74:14 86:16 131:14,16,20 134:25 135:8 157:5 166:18 168:2 174:17 reliability (1) 131:1 relied (2) 19:3 103:3 reluctant (1) 130:4 rely (3) 64:9 72:11 102:25 remain (3) 55:2 68:25 70.25 remakes (1) 187:11 remember (118) 1:22,25 5:2,4,12,16 7:13.14 8:10.12 14:2,4,6,11 15:2 17:4 23:9 27:8 33:12,14,16 35:20 40:19 42:11 47:10 50:9,10 57:6 67:25 68:1 69:5 70:21,24 75:24,25 76:2.4.11.15.18.18.21.25 77:13,17,23 78:23

79:2,8,11,17 80:24

81:2,5 85:13,21

requires (1) 195:15

reread (2) 189:12,13

86:1,3,8 87:2.8.10.19.21 88:6,18 90:2 91:6 92:5.6.14.17 93:20.21 96:13.16 97:18 99:22 100:13 101:16 103:13 106:16 108:9 109:2 110:10 113:18 116:14 119:21 123:12 127:19 130:6 138:14,16 139:9 141-23 143-6 17 145:25 149:14 157:8 161:18.24.25 162:1.8 170:16,22 171:17 172:2,3 174:7,13 175:20 177:13 178:25 179:2 210:14 213:3 remit (4) 5:15,18 15:7 65:9 rep (2) 91:7,10 repeat (1) 193:24 replacement (1) 83:22 replied (1) 166:5 replies (3) 160:8 193:10 199.18 reply (3) 45:4 134:10 167:12 report (12) 12:2 18:2 86:20 97:12 98:13 100:8,11,11 101:3 139:23 140:4 211:16 reported (2) 202:6,9 reporting (8) 12:23 13:20 14:17 18:13.14 20:14 22:18 56:14 reports (8) 68:18 69:3,24 101:4 134:19,25 135:2 211:13 representative (5) 76:16.25 97:4.5 198:13 representatives (1) 81:3 request (5) 109:22 131:4 154:21 156:4 requested (1) 187:9 requests (2) 32:2 208:11 require (3) 51:12 156:8 213:16 required (23) 5:24,25 6:16.17 21:16 46:2 64:4 65:3,8 67:13 72:16 74:12 89:24 126:16 130:24 138:13 156:10,16 157:3 158:7,13 165:2 182:16 requirement (8) 50:5 125:19 126:5,18 142:22 155:10 161:8 162:6 requirements (27) 6:2,11 27:19 32:5 46:20 47:15 56:3 58:6 61:13,14 62:6,25 93:13 124:22 126:23 129:19 132:8,10,16 133:16 134:3 135:13 139.10 149.25 154.7 155:21 180:1

rereading (1) 191:11 residential (1) 48:17 resin (2) 150:18 151:5 resist (1) 6:17 resistance (4) 6:8 82:1 107:16,17 resistant (1) 213:2 resolve (1) 151:23 resource (8) 40:5 42:8,9 47:17,24 56:4 202:11.15 resources (2) 45:15 46:21 resourcing (1) 44:15 respect (7) 39:20 103:4.5 168:9 193:22 194:4 209:13 respond (3) 165:5 172:1 178:3 responded (2) 167:1,5 responding (3) 32:5 187:25 198:9 responds (6) 133:3 159:8 187:19 195:2 196:17 200:5 response (15) 28:20 45:17 128:3 129:24 130:6 133:23 134:16 135:18 159:25 161:17 162:24 165:15 171:25 182-5 201-7 responsibilities (4) 55:16.19 74:9 202:22 responsibility (20) 16:3,14,20 18:21 34:8.19.23.25 51:5 55:23 71:19,21 101:22,25 192:16 203:3,7 204:10 206:22 responsible (10) 27:12 51:9 52:23 61:16 80:15 178:9 188:3 192:19 202:23 209:11 rest (1) 58:1 resubmit (3) 189:4,17 191:12 resubmitted (3) 189:10,22 190:4 results (8) 122:15,20,22,23 123:11 125:25 128:11.14 retardant (1) 213:2 return (2) 158:14 201.17 returning (2) 201:3,5 reverse (1) 169:15 revert (1) 201:13 review (8) 68:18 110:19 150:24 173:11 175:20 176:13,16 183:19 reviewed (7) 113:23 177:20 190:17 199:9 205:12,20 206:13 reviewing (1) 129:10 reviews (3) 176:8,9,10 revise (2) 189:4,17 revised (5) 15:20 187:8 196.2 200.12 201.3 revision (2) 197:21 200:16 revisions (3) 190:19,21

revnobond (14) 24:14 60:11,23 70:1 103:8 114:6.9.13 208:24 211:20.24 212:3.21 213:1 rfi (5) 156:2 157:7,8 158:22,25 rfi001 (1) 155:9 rfi001cavity (1) 161:7 riba (2) 35:16,18 righthand (5) 9:1 10:20 98:8 188:24 199:10 rigid (1) 38:3 ring (1) 144:13 ringing (1) 85:20 risk (3) 21:10,11 208:10 risks (1) 5:20 rivets (1) 25:13 rob (8) 41:14,18 43:4,8 53:14 175:10 181:5 186:22 rockwool (11) 135:23 136:3,6,8,20,25 137:6 139.2 4 12 154.18 rods (2) 150:18 151:5 role (22) 5:21 15:13,16,19,22 16:10 17:25 36:12 40:1 42:3 77:24 80:21 111:25 112-3 118-15 17 121:9.19 177:16 178:4 191:4.6 roof (2) 195:10,15 room (5) 1:6 7:15 57:7 137:1 173:19 roome (60) 2:6 3:22 4:1 12:21 14:10 74:16 75:1,22 76:10 77:2 82:4,21 83:1 84:14 85:8.11 86:11.23 93:16.24 98:2 99:20 100:9 110:5,13,16 111:21 112:1,15 113:19 114:7,12,15 115:11,17 122:5 124:24 127:4 128:2 129:14,23 133:3 134:8 136:17 139:20 142:8.23 143:25 144:23 146:14,17 148:10 149:9.12.16 150:10 151:14 152:3,8 172:18 roomes (2) 12:16 133-23 roubaix (1) 8:1 roughly (2) 107:18 139-10 rounds (5) 146:25 149:1.2.5.8 route (1) 211:23 routes (1) 148:5 routinely (2) 14:19 190:2 rs (1) 78:20 rs5000 (94) 69:14 71:6,8,12 75:18 78:9,14,17 79:15,21 80.7 81.13 83.20 84:20 85:5 86:16 89:6

90:16,23 94:5,20

95:10,25 96:15

97:13,19 101:14
103:8,12 106:9
107:3,10,13
108:2,4,8,10,13,18,22
109:3 111:9,16 112:16
113:7,8,12 114:16,25
115:7,12,15,19
116:9,15 122:5,15
123:11 125:17 126:2,8
131:5 133:24 136:22
139:7,16 140:25
141:9,19,21 143:12,19
144:10 146:4
149:16,20 150:2
152:17 153:4,14,24
154:2,10 163:10,21
164:1,9 170:24 171:10
172:6,19,22,25 173:6
rules (1) 135:5
run (2) 75:12 163:21
running (1) 185:25
runs (1) 9:24
russian (1) 8:3
ryd00002798 (1) 174:18
ryd00016885 (1) 207:16
ryd000168855 (1)
207:23
ryd000171281 (1) 117:6
ryd000171284 (2)
117:3,13
ryd000435474 (1) 195:8
rydon (51) 17:5,10,16
18:2 19:25
28:18,18,25 35:3,3
39:21,23
40:13,17,19,22,25,25
41:6,9,22 44:7 55:4,11
80:3 88:16 108:17,21
118:5 141:7 155:3,4
156:5 162:22 163:25
171:14 174:8
175:11,14 176:19
178:21 186:4,10 187:6
188:6 191:2 192:16
193:1 194:1,2 201:22
rydons (3) 17:17 58:6
62:1

S

safe (2) 79:12 115:19 safety (9) 21:15,19 32:9 118:22 126:23.24 135:9 136:23 159:19 sailed (1) 84:25 sales (10) 76:19 79:4,6,14,20,24 91:7,10 112:5,13 salesforce (2) 105:23 121:4 sam (3) 41:13,18,22 same (25) 18:9 29:18 78:11 107:8 113:9 126:3,14 127:13 129:7 132:17 138:5 141:17 160:8 162:20 163:18 164:6.8 168:15 187:19 194:12 196:25 197:5 200:15.19 210:20 sand (1) 176:15 sarah (3) 4:6,19 9:19 sat (2) 82:14 111:21

satisfactory (1) 136:23

satisfying (2) 73:5 126:22 save (1) 25:25 saw (5) 26:10 46:8 50:5 141:15 147:9 saying (53) 5:15 11:9 12:23 25:24 26:13 37:12 39:10 43:7,22 45:2 55:11 56:22 61:4 62:20 63:8 79:11 83:1,14,23 88:6 90:8 92:16 102:4 104:1,8,10,12,17 105:5 113:5 126:5.14.16 127:25 128:18.19 134:5.10 143:18 148:12 157:23 161:15 165:5 170:6,7,8 171:6,8 187:7 191:14 198:9 199:20 211:10 sceptical (2) 138:2,4 scope (1) 51:22 screen (5) 2:9,10,11,11,17 scroll (2) 133:3 134:15 scrolling (1) 25:21 sea00000169 (1) 58:4 sea0000016963 (1) 58:13 sea0000016964 (1) 58:17 sea0000016968 (1) 66:17 sea0000016973 (1) sea00003093 (1) 188:14 sea000033103 (1) sea00003316 (1) 199:7 sea00011528 (1) 53:6 sea000115282 (1) 53:14 sea00011681 (1) 32:12 sea00012756 (1) 186:16 sea000127561 (1) 187:18 sea000127562 (1) 186:23 sea00012758 (1) 192:5 sea00012761 (1) 193:10 sea00013221 (1) 194:10 sea00013262 (1) 195:22 sea00013263 (1) 196:24 sea00013350 (1) 183:20 sec (1) 181:23 second (14) 4:5 23:19 25:8 59:5 66:23 69:12 70:12 89:4 99:3 123:8 142:10 194:10 199:3 201:2 secret (2) 25:12,17 section (15) 6:21 8:22 58:14,15,18,19 59:4 60:4 61:6 66:19 70:7 90:22 94:16 101:2 207.23 sectionselevations (1) 159:12

satisfied (5) 47:2,8

satisfy (5) 132:10,16

134:12 135:7.13

94:10 105:14 136:20

3:5,7,11,14,17,19,23 4:5.7.16.19.21 6:19 7:1,22 9:1,15,23,25 10:20 11:1.4 12:3 13:17.19.22 16:5 17:11 20:2,15 22:5,19 23:7 24:2,22,24 25:19 26:2,13,13 28:14,21 29:16,19 30:4 32:6,15,17,22 33:7,10 36:1.15 37:11,21,22,23,25 38:4.7.10 40:7 41:10,20 42:25 43:7,13,20 44:2,11 45:1.5.10 48:11.23 49:7 50:7 51:24 52:7,11,16 53:10,20 54:8 55:11.13 58:7,12,15,17,24 59:4,10 60:13 61:10 63:6.17 64:24 65:19 67:4 68:20,23 70:10,11,15,19 71:8 72:17 74:13 75:1 16 76:12,23 77:14 80:18 81:16 82:3.5.10.18.23 83:5,9,13,18,24 85:5,7,8,10 88:10,20 89:4,7,7,20 90:20 91:2.16 92:3 93:12 94:15.23 95:16 96:9.11 97:16 98:18.24 99:2.3.4 100:10,18,24 101:5 102:23 103:9.24 106:1,3,5,13 107:4,10 109:11,19,21 110:3,12 111:12 112:25 113:14 117:6,8,11,14,14,25 118:9 119:10.17 120:12 121:6,7,10,15 122:6,11,14,23 123:5,10 124:17 125:22 126:6 128:18 130:16 133:3 134:15.22 135:10,18,25 138:11 139:19 140:14 142:9.20.23 144:22 145:6,15,21 147:4,25 150:11,19 151:2 152:8.23.24 153:2.6 155:6,13 156:3,6,9,12,21 158:15 17 159:5,7,15,17 160:1,11,25 161:3,7,11 162:14 163:4,14,14,16,18,22 164:10.19 166:25 167:9 168:12 169:9.10.24 171:5 175:7,9,11 177:24 178:1,16,23 179:19 180:9,13,25 181:2,12 182:3,10 183:17,25

184:10 186:8,19

187:1,2,13,18,21,22

190:6,8,10 191:14

194:17,21

188:1.16.17.22 189:6

192:3,13,23 193:10,15

154:22,25 155:3

195:1,5,8,11,17,19,22 196:4.14.19.22 197:2,14,21,23,23 199:1.5.8.10.12.22.25 200:2.13.25 201:2,6,23 204:8,23 205:22 207:18,20,24 208:16 212:8 seeing (7) 5:2,4,12 56:20 93:20 163:9 170.4 seek (1) 206:12 seeking (1) 138:23 seem (6) 146:24 149:1 155:15 166:3,9 184:11 seemed (1) 186:13 seems (2) 4:18 121:5 seen (16) 12:20 50:3 87:2 93:12 99:18 102:2.3 121:12.16 146:14 147:19 159:10.20 166:14.23 204:5 select (2) 107:17 112:16 selected (7) 36:23 39:4,11 93:7 173:3 205:10.17 selecting (2) 39:8 68:9 selection (4) 24:14 35:24 36:6 132:25 selfish (1) 23:21 send (36) 10:11 11:12 14:24 16:19 19:19 30:1 31:2.6 54:4 65:14 73:17 80:18 84:21 91:23 92:16 122:2.4 134:20,24 135:6,12,16 140:2 141:5 145:14 157:7,8,14 160:2,4,5 164:12 175:6 184:21 201:12.19 sending (12) 30:20,22 139:25 155:3 176:11,18 181:7,23 186:20 187:15 194:1,6 sends (4) 158:16 161:3 195:23 196:16 senior (3) 45:19 204:1,5 sense (3) 61:1 114:20 138:11 sent (50) 14:20,25 19:11 29:18 31:11 41:18 49:13 86:22 88:14 92:19 93:15,24 95:22 100:9 101:15 105-19 110-14 114-22 124:23 127:4 142:12 143:14,22 145:13,22 146:14 152:13 154:7 163:8,10 166:12,15,24 170:2.18 175:9,12,18,21,22,23 178:19.25 191:2 194:19,23 196:15 198:11 200:9 201:9 sentence (3) 12:3 23:19 43:24 separated (1) 44:20 september (26) 1:1 22:16 67:21 80:19 23 92:16 109:11 110:6 116:23 117:2,7

156:8,9 158:16 160:8.12 161:5 162:20 168:15 172:21 179:8 180:13 214:16 serrated (1) 181:11 service (2) 44:9 46:4 services (3) 48:8 52:6 82:24 set (14) 9:23 33:9 90:24 95:13 96:4 107:12 119.8 122.21 128.9 131:1 133:20 182:14 183:10 197:12 sets (1) 100:16 setting (2) 15:22 202:22 settle (1) 151:1 seven (1) 8:10 seventh (1) 3:12 several (3) 67:6 168:22 208.6 severely (1) 44:6 shadow (2) 179:13 180:9 shadowing (1) 202:17 shall (1) 196:8 shapes (1) 26:25 share (2) 24:4 142:3 shared (4) 119:13,16 140:9 144:6 sharing (1) 143:11 sharman (2) 74:16 75:2 sheathing (1) 90:19 sheet (4) 86:19 140:6 166:14.23 sheets (1) 209:2 shell (1) 173:20 ship (1) 84:25 short (5) 57:4,15 120:18 173:14,25 shorter (1) 196:12 should (16) 2:13 12:1 13:20 14:1,6 39:4 52:14 61:7 85:3 108:2 114:16 141:9 151:13 168:6 189:22 213:5 shouldnt (1) 148:4 show (9) 4:12 37:17 114:8 116:21,22 117:23 122:21 128:10 163:7 showed (4) 81:6 114:2 135:3 175:14 showing (10) 25:4 36:9 81:3 111:10 113:22 122:24 132:9 139-23 25 140-6 shown (12) 10:19 18:4 19:14 36:4 94:1 95:22 113:25 114:7 160:18 161:22 177:7 179:2 shows (2) 121:4 164:25 sic (1) 117:24 side (8) 3:10 6:5,5 37:25 51:25 89:21 117:8 188:24 siderise (2) 70:3 103:5 sig (6) 146:5 152:16,18,18,23 153:20 sight (1) 143:2 sign (5) 35:2 135:14 138:25 208:8,10

64:14 102:19 105:15 133:2 146:10 185:6.20 186:15 209:15 210:20.21 significant (5) 21:19 36:5,12 87:16 153:25 signing (2) 35:12 185:2 similar (9) 22:25 59:8,15 61:2 88:4 97:18 107:17 124:8 154.16 simon (37) 29:18,21 32:14 41:6.8.11 53:16 117:18,20 118:6 155:3,4 156:5 162:21 174:20.23 183:21 187:1,2,5,6,15,25 192:7.9.16 193:10 194:12.20.23 195:24 197:7 198:11.14.20 200:8 208:4 simple (1) 133:19 since (1) 49:24 single (2) 46:13 175:3 sir (51) 1:3,8,9,10,12 2:10,13,18,22 3:1,3 17:14 57:1,3,9,10,17,20 73:12,19,23 74:1,3,6 120:6,8,20,23 125:7 126:21 133:5,8,17,21 166:2,6,9,17 173:12.18 174:2.4 207:13 209:16.20 213:12,15,19 214:7.8.13 sit (3) 204:3,4 207:11 site (12) 28:17,23 29:5 49:16 67:1 106:10 117:6 151:21 152:6.9.10 175:1 sits (1) 204:4 sitting (4) 7:15,15 204:7,25 size (1) 202:20 sketch (1) 188:20 sl (3) 117:17 208:2.12 slab (9) 135:23 136:3,6,8,20,25 137:7 139:3.5 slide (7) 4:16 9:1,17 10:16 11:1,6,24 slides (4) 4:12 9:23 14:17,20 slight (1) 2:20 slightly (1) 33:1 small (1) 211:24 software (5) 106:11,20 107:12,24 118:13 sole (1) 136:16 solely (1) 80:21 solution (2) 83:16 156:15 somebody (10) 38:6 40:15 45:18 47:11 113:6 125:8 130:23 144:4 152:13 157:14 somehow (1) 143:2 someone (13) 37:22 45:20 21 47:11 50:17 80:13 106:5 113:11 143:23 185:24 190:8 signed (14) 54:7,8 62:9 202:16,17

something (31) 9:13 14:18 18:17 67:16.19 72:1,8,11 77:8 79:3 81:15 92:13.19 99:7 100:2 105:1 106:23 137:22 143:16 148:9,19,20 155:10 162:7 166:12 177:15 184:21 201:21 207:1 209:8 212:23 sometimes (4) 6:3 91:23 179:23 184:21 somewhere (1) 7:15 soon (1) 134:21 sort (17) 18:3 44:21,22 49:24 58:11 77:7 85:18 112:5,18,19 113:3 123:1 128:4 131:7 135:5 142:18 180.1 sorted (1) 2:14 sorts (3) 5:10 26:9 178:9 sought (1) 50:10 sound (1) 4:2 sounes (7) 22:15 23:1.16 32:15 155:5 186:21 207:1 sources (1) 84:7 spalling (2) 12:1,6 spandrel (1) 25:7 speak (7) 54:24 75:4 84:18,24 85:12 172:10 182:25 speakers (1) 4:5 speaking (3) 33:16,18 128:16 spec (3) 117:21 118:7 141:15 special (2) 142:21 192:24 specialisms (1) 138:2 specialist (4) 140:10 144:7 152:12 204:24 specialists (14) 22:24 135:24 136:4,9,20 137:8.11.21 138:12,19,22 139:7 140:20 205:2 specials (1) 153:5 specific (17) 48:21 68:13 69:23 70:25 81:18 96:16 97:5 103:11 112:22,23,24 114:25 115:7,13,15 130.24 175.1 specifically (7) 76:2 114:12 115:5 116:13 118:17 170:18 188:10 specification (63) 18:24 24:15 36:11 37:18.19 39:5 57:24 58:3.4 59:7.14.19.23 60:1.15 61:12 62:4,14,21,23 63:10,20 66:16,20 67:7,12,17 70:5,8,21 71:7,11 72:2 73:15 81:14 86:11,21 93:10,17,19 94:5 95:3

see (341) 2:4,17,19

96:14 102:10 103:6

107:25 108:2 114:7

125:12,14,18 126:17

119:6 124:19,20

141:17,19 164:7,9
177:20 205:11 206:9
212:3
specifications (3) 85:16,17,20
specified (32) 24:7,16
38:19 58:25,25
60:7,16 61:2 64:5
65:4,11 70:22 72:22
78:1 82:11 86:6 88:5,7 101:23 102:3 107:21
116:17 119:5
141:3,14,21 144:10
149:19 177:24
205:10,18 209:22
specify (2) 6:9 77:25 specifying (2) 98:15
118:25
specs (2) 54:6 146:22
spectra (1) 60:12
speculating (1) 128:13
speed (1) 208:3 spelt (1) 188:10
spending (1) 183:3
spoke (5) 13:15 106:24
110:5,21 211:7
spoken (3) 110:23
133:8 211:5
spread (18) 4:23 6:13,25 7:2 8:22,23,25
9:9,14 11:21,22 92:2
156:20 157:5,25
158:6,7 169:18
spreading (1) 160:19
square (2) 20:12 76:6 squared (1) 209:23
stack (1) 159:1
stage (10) 21:23 26:8
33:25 61:9 64:23
175:2 205:15
206:11,25 212:4 stages (4) 19:21
35:16,18 48:22
stamp (13) 188:24,25
190:6,9,12,13,18
191:1,5,9 192:1 197:4
199:9 stamped (4) 190:16
195:9 200:2 201:14
stamping (1) 201:8
stand (1) 127:13
standard (4) 67:3,6,14
91:5 standards (4) 32:9
58:25 66:21 104:14
stapley (14) 3:16 15:24
38:15,23 64:21 65:7
110:18,23 111:4
175:10 181:4 183:22
186:22 202:10 stapleys (2) 38:13,18
start (20) 4:15 22:13
24:20 27:25 43:2,9
54:6 68:10 88:22
112:5 120:10 130:6
154:25 160:12 165:9 178:11 186:17 197:24
207:15 214:4
started (8) 15:15 29:3
42:22 122:8 123:13
134:2 139:9 209:12
stated (10) 54:11 56:2 106:9 107:2,10,25
100.5 101.2,10,23

108:3,8 166:7 169:19 statement (30) 35:15 36:18 39:10,18 42:12.14 44:1 48:3 49:9.21 55:17 68:11 69:21 76:12 87:7 93:20 97:18,19 98:10 102:22 103:15 116:18 155:19 170:20 177:16,18 178:11 191:7 203:21 207:1 stating (3) 54:14 108:3 155:22 status (16) 188:25 189:2,5,18 190:4,23 191:23.25 195:9.19 197:1 198:7 200:2 201:9.14.18 statutory (1) 62:25 stay (2) 6:15 63:25 staying (3) 3:19 10:15 121:1 steam (1) 202:13 steel (3) 6:9 12:12 90.18 stepbystep (2) 193:21.25 steps (7) 19:6 27:21 79:14,18,19 172:5 206:17 sticking (4) 48:1 55:20 146:13 154:20 still (10) 2:16 44:7 66:18 76:1 85:16.23 111:9 113:21 154:20 191:11 stock (1) 176:16 stop (4) 6:4 9:9 120:9 157:24 stopgap (2) 42:5 55:9 stopped (1) 177:14 stopping (1) 168:23 storeys (2) 83:11 91:1 story (6) 42:25 84:12 121:1 174:18 192:4 straight (1) 42:16 strategy (2) 206:22 207:3 striking (1) 7:9 string (5) 45:5 46:7,8 83:1 84:3 struck (1) 87:19 structural (37) 5:7,19,22,23 6:1,1,12 10:10 14:23 15:8 17:3,6 26:11,14 32:3 72:8 73:21 77:13,25 78:1 80:22 90:18 93:4 100:6 112:8 135:4 137:18.20 152:10 167:7 179:25 180:7 181:16 182:14 184:23 204:2 209:16 structurally (1) 26:24 structure (2) 122:19 127:8 studied (1) 63:16

125:2 131:10 141:7 155:4 158:16.22 163:24 165:8 171:14 176:19 178:14,22 186:4 187:19 188:25 191:2 197:4 199:9 200:6 201:13,22 study (3) 101:13,19 102:1 studying (1) 183:7 stuff (3) 43:9 69:5 135:15 styrofoam (2) 38:6,16 subcontract (1) 18:25 subcontractor (2) 202:23 204:4 subcontractors (1) 15:4 subject (12) 33:7 85:3,4 122:4 147:2,21,25 148:14.23 179:9 189:3,16 subjects (2) 5:10 8:15 submit (4) 60:8 72:2 182:16 209:14 submittal (1) 182:21 submitted (3) 54:4 132:18 136:5 submitting (1) 185:14 subsequently (1) 46:4 substance (1) 212:10 substantive (1) 44:4 substituted (1) 59:8 substitution (1) 59:15 successfully (4) 75:7 90:23 91:5 95:10 sufficient (3) 46:14 47:3 56:9 suggest (12) 41:17 113:14 130:20.21 132:22 136:15 139:6 145:8,15 158:1,5 203:11 suggested (2) 139:7 156:15 suggesting (2) 139:15 157:11 suggests (7) 111:14 114:24 115:6 132:1 157:1 179:23 181:14 suitability (5) 71:15,20 103:8 115:15 131:5 suitable (20) 48:25 79:21 80:13 82:13,15 83:22 84:4 10 102:5 103:19 115:12 116:3 118:21 126:13 128:24 136:13 139:16 140:25 170:25 177:25 summary (2) 5:1 10:24 summaryssic (1) 174:24 supervise (1) 56:10 supervising (6) 20:18 56:12,13,17 202:1,3 supervision (3) 51:2 56:7 202:3 supervisory (2) 55:16,22 supplied (2) 52:13 212-21 supplier (3) 50:22 73:17

61:12 62:4 68:19

88:16 103:4 108:17.21

152:21 supply (5) 60:8 84:23 211:20,21,23 supplying (1) 211:24 support (5) 101:13,20 122:19 127:8 212:7 supporting (1) 116:14 supports (1) 25:18 suppose (1) 143:15 sure (32) 6:15 16:2,20 19:11.18 20:3 34:3,4,4,25 40:15 54:6 55:19 58:22 61:17 66:8 74:23 80:12,15 85:15 106:12 126:15 151:22 180:1 182:18 186:1 203:10 209:12.12 211:7 212:6 213:21 surprised (1) 140:3 surveyed (1) 195:15 suspended (1) 169:1 suttle (2) 82:24 83:14 symmetry (1) 187:9 system (38) 9:20,25 10:3 11:14,25 25:12 60:9 68:20 81:18 96:4,7,11,16,25 97:6 98:12,14,16,24 99:1,2,11,14 100:1,17 101:1.14.20 114:3 115:13.18 129:6.7 130:9.22 138:20 168:4 184:16 systemised (1) 67:3 systems (5) 16:15 25:13 75:8 90:17,18

t (1) 25:16 table (2) 89:5 179:16 taff (1) 151:20 takeaway (2) 12:16 taken (6) 68:15 79:19 108:4 170:6 183:13 208:23 takes (1) 137:1 taking (3) 26:1 34:18 183:6 talk (13) 4:9,12,16,21 5:13 28:19 36:23 57:6 69:10 79:4 112:11 120:11 214:5 talked (4) 97:3 109:3 111:21 202:2 talking (10) 45:14 74:23 91:15 167:24 173:18 178:13 191:21 197:24,25 205:25 talks (3) 46:10 94:22 97:22 tall (1) 76:20 task (2) 51:7,11 taught (1) 166:22 team (63) 12:24 16:18.25 17:10,17,18,23,25 18:8 28:18 30:2,7,9,11,15,18,19,20,22,23**t** (1) 37:21 31:3,14,20 32:8 39:25 40:13 43:18.23 44:24 45:2,8,14 46:9,10,12

49:15 54:22,23,25 62:1 65:16 73:18.19 81:10 91:24 110:21 114:23 116:19.20.23 117:3 119:14 120:3 132:19 141:24 174:25 176:12 204:1,5 207:15,17 208:22 211:17 technical (15) 4:17 16:8.11 65:14 73:1 82:24 146:15 147:12.17 148:10.17 177:23 204:19 211:17 technology (2) 66:22 67:2 telephone (1) 50:11 telling (1) 164:10 temperature (1) 12:11 temperatures (1) 140:1 temporarily (1) 39:21 temporary (1) 42:5 ten (1) 9:2 tended (1) 87:4 tender (9) 60:6 61:8 119:13.15.23 174:9 175:11,14 177:22 tendering (1) 27:16 tends (1) 155:12 terms (22) 5:5 8:4 10:2 14:17 31:22 36:12 51:17 52:10 58:1 59:12 64:7 69:8 87:17 124:3 137:7 158:7 170:7 184:17 185:4 186:14 204:20 210:16 terry (10) 158:17,20 159:14 160:12,13,24 168:13,17 169:11 170:1 terrys (3) 168:21 test (35) 9:24 10:5,17,19 11:10,15 12:2 79:14 86:20 91:5 95:12 99:23 100:8.11 101:4 122:15,21,22,24,25 123:11 125:25 128:9,11,14,24 130:25 134:19.25 135:2 140:1.2.8 142:9 143:11 tested (24) 23:22 83.17 24 90.23 91.5 92:1 95:10 96:5,7,15,21 97:6 98:13.14.25 99:3.14 100:17 122:17 129:7 130:9.22 138:20 168:5 testing (16) 4:9.11.17.24 9:18.22 10:17 122:17 125:16.17 126:1 127:21 128:13 131:14 152:10 168:8

tests (8) 9:20,20

126:1 138:19

10:3,22 94:22 96:22

thank (27) 1:12,15 2:25

3:1,2,4 57:10,20,22

169:6 171:5

thought (40) 27:5,14

74:6 83:15 106:15 110:16 120:7.14.23.25 133:21 162:24 168:18 173:17.21 174:4 207:14 214:8.12.13 thanks (5) 144:25 146:19 147:8 181:7 182:1 thats (46) 2:2 5:8,25 9:13 11:5 26:4 39:6 42.13 48.14 56.24 59:23 82:20 85:18 100:10.17 104:22 113:2 127:22 128:20 139:3 146:8 148:2,6 150:22 151:12 165:5 166:8 167:10 169:8 170:1 171:7 176:6 180:10 186:6.12 192:1,2 196:24,25 198:5 200:16 204:16 207:2 209:22 210:4 213:9 theirs (1) 134:5 theme (1) 48:1 themselves (2) 114:5 137:21 therefore (15) 35:23 51:6 53:24 71:7 75:8 90:25 95:14 135:9 156:19 157:21 162:25 164:16 165:17 204:6 209:20 therein (1) 43:18 theres (30) 6:3,22 7:1.3.22.23 9:1.23 10:18,21,25 11:19,23 12:12 28:15 38:9 70:12 83:8 98:9 110:18 157:3 160:11 169:7 178:6 183:23 190:9.19 195:11 198:21 213:10 thermal (10) 68:22 69:11 70:10 100:5 107:16,17 118:16 133:11 136:12 138:1 thermocouple (1) 139:25 theyd (7) 126:5 138:8,10 143:15 189:23 191:2 203:10 theyre (11) 7:9,17 38:1 64:9 72:4 140:22 152:21 186:1 194:3 200:20.21 theyve (5) 96:11 165:10,23,23 191:9 thickness (6) 89:24 107:18 111:15 117:23 118:25 181:10 thicknesses (1) 112:24 thin (1) 209:2 thing (5) 44:5 126:3,14 166:23 202:25 thinking (1) 124:2 third (8) 6:24 11:5 29:24 69:11 97:10 102:25 205:5,7 thirdlast (1) 25:8 though (4) 30:10 47:6

39:4 47:14 51:14 55:9 61:5.8 71:18.21 81:9 85:25 86:4 88:8,10 89:14.16 97:21 102:9.11.13.18 106:22 116:2 121:14 123:23 129:8 135:12 138:24 141:11 144:11 164:8 170:17 171:11 186:12 191:4 192:19,21 193:4 210.21 thoughts (2) 141:23 211:18 three (8) 18:3 25:9 35:21 109:12 128:8 174:24 175:11 177:18 through (25) 11:25 19:20 48:24 62:3.13 86:17 89:15 93:2 102:17 124:4 132:18 145:2,8,11,12,17,21 146:5.21 153:20 154:22 169:1 176:17 182:15 200:4 thursday (1) 43:4 thursdayfriday (1) 109-24 tidyup (2) 182:17,18 till (1) 145:1 tim (6) 44:8 81:24 82:3.25 83:2.10 time (141) 6:16 8:6 9:7.8 11:8 12:21 17:5.19 18:7.9 20:8 21:14 22:23 23:12 24:4.10.17 29:14 30:8 31:14,16 32:11 34:22 36:14 42:2,8,17 44:14 46:25 47:2.12 50:21,23 53:5 54:13.13.23 56:10 58:10.21 61:17 64:13 65:10 67:23 68:1,3,15 69:1,13,18 72:6 75:18 80:9 81:12 84:7 86:25 87:2,20,21 88:6,23 90:7 91:4.19.21 92:5,10,18,24 93:23 95:3 96:19 98:5,25 99:8.13 100:14 101:8,12 103:17,18 104:15 106:18 109:12 117:1 120:8 121:13 123:20,25 124:25 125:2 128:1,4,22 129.1 130.8 132.2 135:2 137:6 139:9 141:15 142:17 143:7 146:13.19.21 147:8 148:7 149:10,21 150:9 157:24 159:22 160:1 163:24 166:11.21 172:14 173:16 181:21 183:3,8,11,12,21,25 185:12.22 196:25 202:10,16 204:18 206:4,7 209:1,4 210:1,5 211:10 212:15,25 timeframes (3) 63:11 178:7 193:3 timeline (1) 63:11

studies (3) 91:22

101:16 102:17

studio (40) 22:16 23:15

28:1 31:6 34:7,7,12,17

152:6

suppliers (2) 146:5

24:21 27:20,22,24

timelines (1) 102:18

times (7) 9:2 59:18,21 76:17 77:1.3.8 title (1) 89:21 tmo (1) 22:17 today (6) 1:4 146:19 147:8 172:18 207:10 213:21 todays (1) 1:4 together (7) 32:14 40:1,13 117:11 156:24 157:10 172:20 told (20) 20:3,11 39:24 41:22 45:18 55:10.11 80:1,3 91:6,10 95:20 96:11 97:4 114:8 130:14 147:16 154:4 162:17 210:15 tolerance (1) 179:13 tomas (1) 23:15 tomorrow (5) 33:4,14 213:14,23 214:11 tomorrows (1) 179:15 too (2) 42:5 146:7 took (3) 87:24 104:20 172-25 topic (12) 6:24 9:17 22:9 57:25 68:7 136:16 172:17 173:10 174:6 176:6 207:10 213:11 topics (1) 15:10 torch (1) 168:25 total (1) 83:11 touch (2) 150:16 186:4 towards (1) 33:22 tower (31) 27:11 33:7 43:10 46:4 53:19 68:9 70:23 71:6 81:4,7 85:4,21 86:12 96:1 106:2,7 109:15 111:7 112:25 114:16 115:14 116:13 141:1,2 149:17 155:5 158:21 170:25 181:20 184:13 201:1 towers (1) 8:1 tp10 (5) 37:7,14 38:3.20.25 track (1) 16:1 tracking (1) 22:23 traditional (1) 68:20 trained (13) 5:17 11:11 72:6,11,12 73:2 98:6 100:5 127:11 148:7 149:6 166:11,21 training (12) 10:12 22:3 6 26:17 18 51:20 105:1 126:25 133:10 145:11,20 168:9 transcript (4) 17:12 18:17 62:17 207:2 transposed (1) 191:19 tried (3) 23:22 116:11 190:22 trinity (2) 20:12 76:6 trouble (1) 130:17 true (1) 169:16 try (4) 55:20 72:17 145:2.24 trying (16) 8:9 9:9 16:1 54.24 118.18 24 119.6 123:24 125:11 149:24 157:24 181:24 182:18 185:24 189:25 201:20

tuesday (2) 1:1 3:6 turkey (1) 8:3 turn (32) 22:13 23:12 24:17 30:2.23 31:3 32:11 35:14 57:25 58:3 67:9 70:5 81:21 88:21 97:24 100:8 102:21 121:3 152:16 154:24 156:2 168:11 176:2 186:16 188:13 195.22 197.6 199:7,18,23 200:18 210:23 twice (2) 137:1 138:5 type (9) 9:22 22:24 60:1 89:14 103:16 169:23 187:8 208:19 212:1 typical (2) 193:18

typical (2) 193:18 198:13 U
u (1) 106:8
uae (2) 211:14 212:13
uk (1) 211:20

uae (2) 211:14 212:13 uk (1) 211:20 ultimately (3) 51:8 192:15 198:15 unable (1) 142:8 underneath (3) 3:16 4:21 51:25 understand (33) 17:17 20:20 21:18 30:21 31:16 35:3,6 37:4 69:25 70:3 72:8 104:25 105:6,8 113:3 129:4,5 136:2,7 137:6 142:15 148:7.8 155:20 157:6 165:1 170:15 186:9 209:1.3.5 210:12 211:22 understanding (27)

34:22 38:15 42:2,4 48:19 51:17 72:18 87:23 107:6,7 130:25 131:7 135:2 149:7,18 185:7 188:3,9 189:8,20 192:15,18 208:21 understood (14) 17:21 49:5 5 50:19 63:9 72:

18:7,9 20:23 21:15

understood (14) 17:21 49:5,5 50:19 63:9 72:9 87:13 93:1 104:18,22 113:8 142:13 172:8 209:5 undertake (1) 51:7

undertake (1) 51:7 undertaking (1) 56:6 unfortunately (1) 83:15 unhappy (1) 148:10 uninvolved (1) 177:12 unless (2) 44:9 148:4 unlikely (1) 129:25 unseen (2) 9:9 157:25 until (9) 16:9 29:3 47:19 71:2,2 78:12 207:11 212:24 214:15 unusual (2) 40:3 203:6 update (2) 146:19 147:8 upon (3) 151:1 184:6 196:9

upon (3) 151:1 184:6 196:9 upontook (1) 103:3 ups (1) 184:8 urgency (1) 160:2 used (67) 14:6 27:2 37:8,15 40:11 64:13

76:20 77:6.14 79:3.4.15.24 80:7 81:19 83:4 87:18,21 88:2 90:8,11,16 91:8,13 95:25 99:9,10,23 100:1 102:15 103:16,23 106:19 108:14 112:21 114:16 115:2,3,9 122:19 126:12 127:7 129:6 132:6 134:11 139:3,24 142:19 143:9.13 148:4 172:13 205:14 211:22 213:6 useful (5) 112:3 123:4 131:25 132:3 133:1 usher (3) 57:11 173:20 214:9 using (14) 25:12 76:1 79:17 80:9 106:8,11,21 107:2,9 111:9 113:21 134:4 141:9 173:4 usual (1) 201:12 usually (10) 14:20,21 18:4 46:16 47:6 139:10 160:4 183:9 209:14.22 uvalue (6) 75:13 106:22 107:15 118:23 119:13 124:22 uvalues (15) 87:13.13.14 105:22 117:14,17

118:11,15,20 125:8,9

132:4,12 133:11

68:9,22

69:2.3.11.14.25 70:4

71:5 72:4 75:24,25

valid (1) 101:1 value (1) 106:8 variation (1) 155:17 variety (1) 90:16 vary (2) 155:12,21 vent (1) 180:17 vents (1) 180:16 venturing (1) 166:3 verified (1) 17:5 verify (2) 79:14,20 version (5) 105:24 163:7.13 191:20 201:23 vertical (4) 8:23 25.15 17 156.17 via (2) 119:14 211:13 viability (2) 204:11,14 viable (1) 27:2 video (1) 10:18 views (1) 133:18 virtually (2) 135:3 213:7 visit (3) 150:11 151:18 152:6 visited (1) 77:1 visiting (1) 76:16

W

vm (1) 60:13

wait (1) 201:16

waiting (2) 194:1 201:13 walk (1) 44:5 wall (19) 3:13 6:6 11:15 22:19.21 37:20 74:17 89:23 90:5,12 114:3 119:14,20 167:23 181:10 184:5,11 198:24 200:11 walls (3) 6:14 159:11,21 warning (3) 47:21 99:18 wasnt (75) 5:14.17.24 11:11 16:13 17:2,2 29:3 32:1 34:2 36:14 39:14 47:23 55:20 56:12 59:17 60:18 61:21 63:12.23 65:20 67:16.19 72:5 73:3,24,24 76:7 80:9,16 81:13 84:11 87:3 94:3 96:2 98:6 99:10 100:5 102:4,8 107:23 113:11 114:17 116.5 126.24 127:10,11 129:15,15 131:13 135:15.15 143:21 147:18 148:3 152:19 153:9 154:2 159:22 162:3,6 166:11.21 168:5 178:7 180:4 185:14.14.23 191:3 198:16 202:5,17 206:6.19 water (2) 81:25 82:14 way (28) 15:25 41:16 48:21 54:16 65:24 79:6 81:11 85:18 87:6 88:5 93:5 102:18 112:3,12 125:20 127:13 130:25 132:10

142:21 149:6 170:23 188:20 191:22 192:2 202:10 waylands (3) 82:5,10 84:25 wed (8) 10:11 28:3 45:23 49:24 125:10,21 126:16 139:13 wednesday (2) 53:17 214:16 week (5) 62:16 116:1 183:6,8,9 weekend (2) 134:18 150.15 weeks (6) 45:13 77:6 84:24 109:12 168:23 183-15 weighed (1) 6:18 weight (2) 209:17,22 welcome (1) 1:3 went (8) 8:14 19:24.25 33:22 48:24 85:19 151:8 176:17 werent (34) 5:15 9:4 12:5 16:8 24:12 32:7 35:10 52:25 53:3,4 54:21 60:19 62:12 63:22 65:18 69:18 84:9 86:4 96:19,21 102:6 116:4 119:6

129:17,20 143:24

135:16 138:9,11

153:12,14 154:13 174:12 179:21 185:12 209:7 212:25 weve (26) 2:10,25 3:4 8:21 12:15 19:3 37:21 93:18 94:16 98:25 99:17 102:2,3 104:3 111:6 141:18 146:4,14 147:19 172:17 175:12 190:22 196:25 202:2 205:16 213:20 whatever (2) 136:5 191:18 whats (8) 31:11 107:6 150:21 151:4 165:12 166:10 180:9 212:11 whereas (1) 198:10 whilst (3) 39:25 40:13 60:25 white (2) 36:24 137:19 whoever (1) 143:14 whole (6) 7:25 16:21 60:9 115:18 159:23

white (2) 36:24 137:19 whoever (1) 143:14 whole (6) 7:25 16:21 60:9 115:18 159:23 196:8 wholly (1) 61:3 whom (4) 147:3,22 148:15,17

whose (7) 34:22 38:14 39:3 94:4 101:22 108:20 191:4 wideranging (1) 15:10 width (2) 180:17 181:9 willoughby (1) 106:6 window (6) 36:22 38:1 66:21 67:2 192:10

197:1 windows (7) 36:25 37:11 54:2,20 156:18 167:25 187:8 witness (23) 1:5,9,11 35:14 36:18 48:2 57:9,19 68:10 76:12

87:7 93:19 102:21 103:14 116:18 120:22 174:3 177:16;18 178:11 203:20 213:13 214:7 won (2) 32:1 123:24

wool (1) 119:2 worded (1) 54:16 work (35) 6:9 26:24 27:22,24,25 35:17 40:4,16 42:17,21 46:1,16,17,18 47:7,8 48:9 53:1 56:6,10,12,17 74:22 112:4 113:3 125:5

wont (1) 207:10

176:20 182:24 183:1,9 184:18 185:15 202:12,14,18 worked (16) 10:11 16:17 18:10 19:5

16:17 18:10 19:5 45:25,25 48:7,14 50:20,21 74:10 77:11 102:18 176:3 185:11 210:19

working (33) 9:5 16:18 30:3,23 31:3 46:23 49:3,25 51:1 52:21,23 53:19 59:2 62:7 64:10 65:13 66:12 68:15 72:5 76:6 77:11 78:3,8 80:10 113:25 114:21 138:8,9 158:21 177:1 198:16 211:25 212:5 workload (2) 19:23 47:1 works (3) 51:22 107:15 159:20 workshop (1) 66:25

workshop (1) 66:25 workwinning (1) 29:3 worried (2) 135:15,22 worst (1) 44:7 wouldnt (55) 5:20 6:12 9:15 14:11,12 18:12,14 19:2 20:23 26:21 27:12 38:14 39:3 45:1 46:14 52:24 54:21 63:13 69:5 71:3

39:3 45:1 46:14 52:24 54:21 63:13 69:5 71:3 72:7,13 78:13 86:8 91:20 93:10 96:2 126:25 127:7,11,12 129:2,19 130:13 137:9 140:21 144:8 145:10,19 150:3 153:9,10,21 154:19 157:9 167:6 171:4 184:18 191:18 199:17 201:15 202:13 206:4,7

209:18
writes (3) 194:13
198:22 200:24
writing (2) 38:18 188:17
written (2) 15:14 135:3
wrong (2) 72:10 196:15

Yeah (8) 39:10 74:24
86:7 100:4 149:13
156:25 166:5 177:10
year (2) 77:7 183:14
yeaterday (21) 1:19,22
2:2 7:7 9:3,8 10:4
12:5 15:13 16:8 17:13
18:18 28:17,24 75:6
145:1 147:16 174:7,11

015 (1) 106:8
04 (1) 16:8
06 (1) 160:19
070815 (1) 160:19
070815 (1) 184:7
1790815 (1) 184:7
1791815 (1) 194:7
187:8 53:9 83.7
18:18 28:17,24 75:6
144:22 186:17,2
187:18 194:11 1

175:14 183:6 yet (8) 32:1,7 41:14 125:6 168:1 199:9,15 201:9 youd (10) 77:23 86:7

97:3 99:10 132:20 145:17 147:10 175:25 186:6 201:19 youll (1) 165:14 youre (59) 22:15 23:17 26:5 29:10 32:14,17 35:17 39:6 44:14 47:12,20,21 55:11 57:7 58:9 63:19 72:11 73:8 74:21 79:19 80:11 82:20,25 104:1,10,24 105:2,4,5 108:3 112:22 113:5

 108:3 112:22 113:5
 1136 (1) 57:16

 115:6 128:18,19,19
 12 (7) 35:14 49:12,2

 151:10,25 157:11,22
 52:1 84:16 139:23

 159:10 169:6
 151:16

 170:1,18,18 171:8
 120 (2) 60:8 160:19

 172:19 173:19 174:19
 120mm (1) 181:9

 175:16 185:17.17.23
 1212 (1) 187:19

186:1 191:14 193:11

207:11 208:22 211:9

yours (1) 81:24

yourself (5) 65:18 105:4 126:22 130:16 142:3 youve (26) 3:3 20:3 31:13 40:11 47:6 48:13 54:8 55:17 61:1,2 65:24 95:4 111:21,21,24 116:18,24 128:18 133:8 139:3 156:14 165:15 171:6 180:22 205:3 200:25

zak (1) 41:19 zinc (6) 27:2,6 60:12,12,13,16 zip (4) 85:7 86:15,23 127:5 zoom (3) 4:14 122:3 190:7

0 (32) 64:9 92:2,9,10,12,17,22 93:1,7,11 94:20 95:2 103:18 131:17 140:8 162:25 164:16 165:17,25 166:10,14,19 169:14,16 170:10,11,13,21 171:6,7 172:11,23 015 (1) 106:8 04 (1) 181:8

1 (19) 23:8 25:9 43:3 45:5 53:9 83:7 109:10,21 135:19 144:22 186:17,25 187:18 194:11 195:25 196:17 207:17 215:2,3 10 (6) 4:18 39:17 187:8 214:4,11,15 100 (1) 143:18 1000 (2) 1:2 117:7 100mm (1) 111:10

1038 (1) 82:23 1057 (1) 133:4 11 (5) 42:13 48:2 60:4 64:1 100:10 1100 (1) 214:1 1104 (1) 187:5 1105 (1) 186:20 1120 (1) 57:14 1130 (1) 214:1 1135 (2) 57:5,13 1136 (1) 57:16 12 (7) 35:14 49:12,22 52:1 84:16 139:23

123 (1) 60:8

**127 (1)** 129:18

1279 (1) 160:19

12mm (2) 96:12 99:4 13 (4) 49:10 207:16,18 210:25 1320 (1) 81:25 13219 (1) 153:5 **135 (14)** 4:11 8:24 10:25 11:5,8,10,14 75:7 90:24 95:13,21 98:10 100:12 168:5 14 (4) 49:14 81:23 82:4.23 **15 (3)** 1:1 53:6,10 150mm (2) 106:9 111:9 **1532 (2)** 160:9,12 **1550 (1)** 161:5 16 (2) 122:4 214:16 1603 (1) 162:21 **1604 (1)** 53:10 160mm (1) 111:11 **1637 (1)** 151:16 17 (7) 109:22 152:24 155:3 156:8 186:20 187:5 192:6 170 (1) 102:23 **1711 (1)** 168:16 **18 (49)** 76:20 79:3.5.12.16.21.25 80:8,14 83:17,24 84:4,10 87:19 88:3,8 89:24 90:6,8,11 91:9.13 95:8.15 102:5,15 103:20,23 109:11 114:20 132:6 134:6,11,13 139:17 142:19 143:9,20 146:16 147:12.17 154:5 158:16 160:8,12 161:5 162:20 168:15 183:21 18m (4) 75:9 84:20 91:1 146:24 19 (3) 43:2,4 133:4 **1991 (1)** 7:4 1992 (1) 7:4

2 (18) 6:21 23:7 43:6 53:9,13 82:22 100:16 101:2 117:7 120:10,13,16 135:19 160:9 161:2 167:14 179:13 186:18 20 (4) 83:11 135:19 181:4 198:20 200 (1) 120:19 2005 (3) 90:24 96:7 122:17 2008 (3) 67:11,21,22 2010 (1) 7:24 2012 (2) 8:2 16:7 2013 (12) 11:5 16:7,11 22:16 23:13,15 64:18 150:9 151:16 210:25 212:14,19 201314 (1) 64:20

**2014 (78)** 1:22 2:6 3:6 4:18 9:7 10:8 11:8 12:23 24:18,19 25:24

28:7,9,25 29:6,14,16

32:11.13 33:22 34:1

39:22 41:6 42:13 43:2

74:17,22 77:17 80:19,23 81:21,22,25 82:4,20 83:20 84:9,14,16 92:16 98:2 100:10 102:4 105:20 106:2 107:20 109:11,22 110:13 116:19,20,21,22,23 117:2,7 127:5 154:22,25 155:3 156:8,9 160:8 168:15 172:18 174:20 178:20 179:8 180:13 181:3 207:16,18 015 (24) 16:9,12 22:1 122:1,4 123:13 135:19 139:20 141:12

2015 (24) 16:9,12 22:1 122:1,4 123:13 135:19 139:20 141:12 146:6,16,17 152:24 181:19,20 183:21 186:20 192:6 195:25 197:22 198:20 199:19 200:7,19 2016 (3) 8:19 16:9 29:3

2016 (3) 8:19 16:9 29:3 2020 (2) 1:1 214:16 20th (1) 178:20 21 (6) 12:23 68:10,11 100:16 139:20 144:23 22 (4) 69:20 178:13 179:8 199:19 220 (2) 66:17,19 223 (2) 199:5,24 223a (1) 200:16 23 (1) 76:12

23 (1) 76:12 24 (1) 110:13 24mm (1) 38:3 25 (6) 24:19 25:24 63:25 64:2 146:6 180:13 2500mm2 (1) 180:18 25mm (1) 38:6

26 (7) 64:1 156:9 197:22 200:7,19 203:20,23 27 (8) 22:16 32:13 34:1 84:14 93:16 98:2 105:20 205:7

105:20 205:7
28 (2) 28:25 106:2
29 (2) 28:9 194:11
29814 (1) 208:9

3 (6) 7:21 98:7 159:7 160:10 167:14,15 30 (1) 77:7 3000m2 (1) 111:9 304 (1) 179:12 31 (1) 41:6 310 (1) 67:8 314 (1) 173:24 32 (1) 63:25 330 (3) 173:15,23 174:1 352 (1) 184:9 362 (1) 117:13 3d (1) 25:4

4 (6) 98:23 100:23 117:13 155:1 206:11,25 42 (1) 103:14 430 (2) 207:11 214:14 **476 (2)** 142:9 143:11 **4767 (1)** 131:14 **4b (1)** 103:21

5

5 (2) 94:14 207:23 50 (1) 199:5 5000mm2 (1) 180:16 51 (1) 200:16 53 (1) 100:23

6

6 (9) 9:17 11:18 29:14,16 52:9 74:17 140:7 145:1 174:20 60m (1) 83:11 63 (3) 36:19,21 58:13 64 (1) 58:17 660 (1) 153:5 68 (1) 66:17

7

7 (8) 2:6 3:6 23:15 140:7 181:19,20 205:6 207:23 701 (1) 207:24 776 (2) 70:6,10

8 (1) 146:16 8414 (10) 4:11 9:20 10:5,17 95:11,21 126:1 128:24 138:19 168:5 84142 (3) 90:24 96:7 122:17

9

9 (1) 177:17 909 (1) 144:23 9th (1) 28:19

48:10 49:12,22 53:6,10 64:19 430 (2) 207:11 214 475 (3) 153:3,6,13 Opus 2 International

Official Court Reporters