## OPUS 2 INTERNATIONAL

Grenfell Tower Inquiry

Day 35

September 14, 2020

Opus 2 International - Official Court Reporters

Phone: +44 (0)20 3008 5900

Email: transcripts@opus2.com

Website: https://www.opus2.com

1 1 Monday, 14 September 2020 You began work in the construction industry, 2 2 (10.00 am) I think, in 1983 as a trainee quantity surveyor. 3 3 (Proceedings delayed) A. That's right, yes. 4 4 (10.05 am)And you received a diploma in quantity surveying in 5 SIR MARTIN MOORE-BICK: Good morning, everyone. Welcome to 5 1994, I think. 6 today's hearing. Today we're going to hear some more 6 A. That's right, yes. 7 7 witnesses from Harley. Q. Since that time, I think you have worked as an 8 8 Yes. Mr Millett. estimator; is that right? 9 9 That's right, yes. MR MILLETT: Yes. Mr Chairman, good morning. We're going 10 10 to hear from Mr Mike Albiston, please. Can we please Q. Can you provide us with a brief description of what that 11 call Mr Albiston. 11 role entails? 12 12 MR MIKE ALBISTON (affirmed) A. Basically, when tender enquiries are received, I go 13 SIR MARTIN MOORE-BICK: Thank you very much, Mr Albiston. 13 through the documents, the drawings, do a measure of the 14 Sit down and make yourself comfortable. All right? 14 materials needed on that project, contact suppliers, 15 15 Yes, Mr Millett. material suppliers, to get the prices, and compile the 16 Questions from COUNSEL TO THE INQUIRY 16 quotation for submission to the main contractor or 17 MR MILLETT: Mr Albiston, good morning. Thank you very much 17 an architect. 18 18 for attending today to give evidence to the Inquiry, we Q. That would involve also pricing jobs in order to tender 19 19 are extremely grateful to you. for projects, would it? 20 If you have any difficulty understanding any of my 20 A. That's right, yes, it basically means like compiling the 2.1 questions, or you would like me to ask them again, I'll 21 prices from other material suppliers. 22 do that or I will rephrase the question. 22 Q. Would that involve consideration of things like the cost 2.3 Can I please also ask you to keep your voice up so 23 of materials, the cost of fabrication, cost of design 24 24 works? that the transcriber, who sits to your right, can hear 25 clearly what you're saying, and I should also say that 25 That's right, it's all costs, really. 1 a nod or a shake of the head doesn't get down on to the 1 Q. All costs? 2. transcript, so if the answer is yes or no, please say 2 A. Yeah. 3 yes or no and don't nod or shake your head, please. 3 SIR MARTIN MOORE-BICK: Mr Millett, I'm sorry to interrupt 4 4 A. Yes, thank you. you so soon, but my transcript is not running. Is yours 5 Q. Now, you have made a witness statement for the Inquiry 5 running? 6 6 dated 8 November 2018. It's in a folder on the desk in MR MILLETT: No, it isn't, and I was going to mention that 7 7 front of you, if you want to look at the hard copy, or if it didn't spring into life. 8 it'll be on the screen in front of you. It is 8 SIR MARTIN MOORE-BICK: Would it be possible to look into 9 9 {HAR00010151}, please. that? Because there are a lot of other people who are 10 10 Is that your statement, can you confirm? seeking to follow the transcript as well. 11 11 MR RENTEURS: My transcript is working. A. It is, yes. 12 Can you please go to page 15 {HAR00010151/15}. Is that 12 SIR MARTIN MOORE-BICK: Oh, we see you are favoured. 13 your signature? 13 Do you have any idea where the problem may lie? 14 MS ISTEPHAN: Mine isn't working. A. It is, yes. 14 15 Q. Have you read this statement recently? 15 MR MILLETT: Mr Albiston, we will take a short technical 16 16 A. I have. pause. 17 Can you confirm that the contents are true? 17 SIR MARTIN MOORE-BICK: I'm sorry about this, Mr Albiston, A. They are true, yes. 18 18 but some people find it very useful to have the 19 19 Q. Thank you. transcript running in front of them. 2.0 Have you discussed your statement or the evidence 20 MR MILLETT: I think, Mr Chairman, the remote access to the 21 2.1 you're going to give today before coming here today? transcript is working but that in the room isn't. 22 22 A. No, I haven't. Thank you. 23 23 Q. Thank you. (Pause) 24 Now, I want to start with some questions about your 24 MR MILLETT: Solved, thank you. 25 background, please. SIR MARTIN MOORE-BICK: Good. Thank you very much indeed. 1 Right, sorry about that. We are ready to go on.

- 2 MR MILLETT: Mr Chairman, thank you.
- 3 Now, I want to ask you some questions about your
- 4 role in general at Harley.
- 5 You say that you began working at Harley Curtain
- 6 Wall in 2013; is that right?
- 7 A. That's right, yes.
- 8 When in 2013, do you remember?
- 9 A. It was the beginning of October.
- 10 Q. Beginning of October?
- 11 A. That's right.
- 12 Q. Before that, you had worked for Astralite.
- 13 A. That's right, yes.
- Q. So you went from Astralite to Harley, did you?
- 15 A. There was a period of about a year when I was not
- 16 working, but yeah, I went -- there was no jobs in
- 17 between that.
- 18 Q. I see, okay.
- 19 At Astralite, you were working on jobs of a value
- 20 between something like £50,000 and £750,000.
- 21 A. That's right, yes.
- 22 Q. Was Harley a larger organisation than Astralite?
- 23 A. It was similar in size. I think the big difference was
- 24 that Astralite was more of a fabricator of materials
- 25 like curtain walling, whereas Harley bought in all their

- 1 materials, so they only -- just supplied the service of 2 actually installing the products.
- 3 Q. I see.
- 4 Would it be fair to say that, after you joined
- 5 Harley in October 2013, you were dealing predominantly
- 6 with projects of a much higher value than the projects
- 7 you were dealing with when you were at Astralite?
- 8 A. Yes, I would say that, yes.
- 9 Q. Were you provided with any training by Harley when you
- 10 arrived?
- 11 A. No.
- 12 Were you provided with any supervision to make sure that
- 13 your work on these larger projects was suitable?
- A. Only really that when I prepared a quotation, it would
- 15 be checked by Ray Bailey or Mark Harris before it went
- 16 out.
- 17 Q. I see.
- 18 How many projects did you work on at Harley before
- 19 working on Grenfell Tower?
- 20 A. Possibly about two or three.
- 21 Q. I see. Can you name those?
- 22 A. I believe one was Great Arthur House, I think it was
- 23 called, which is near Golden Square, which is
- 24 a tower block, and there may have been a small curtain

6

25 wall project, I can't recall the name of it. Q. Right.

2 You say Great Arthur House was a tower block; did it

- 3 exceed 18 metres in height?
- 4 A. I believe it did, but it wasn't clad. It was more
- 5 windows and glass cladding, it wasn't actually any ACM
- 6 or aluminium cladding.
- 7 O. Was it residential?
- 8 It was residential, yes.
- 9 Q. Was Grenfell Tower the largest project on which you had
- 10 ever worked?
- 11 A. Possibly, yes. I can't recall. It was, you know -- I'd
- 12 worked on a lot of projects at my previous jobs, but it
- 13 probably was one of the largest ones, yes.
- 14 Before you would ordinarily provide a price on any
- 15 project, would you need to consider the
- 16 NBS specification for it?
- 17 A. Yes, I would.
- 18 Q. And also any drawings prepared by the architect?
- 19 That's right, yes.
- 20 What about employer's requirements, would you consider
- 21 those as well?
- 22 A. I would briefly look through those, but they would be
- 23 more of a job that Mark Harris or Ray Bailey would look
- 24 into.
- 25 O. Right.

7

- 1 Is the reason you looked at what you did look at
- 2 that, without that information, you wouldn't be able to
- 3 consider what Harley was required to do for that
- 4 particular job?
- 5 A. That's right, yes.
- 6 O. Yes.
- 7 So is it fair to say that, as an estimator, you
- 8 would have to have a broad knowledge of design in order
- 9 to be able to price the works accurately?
- 10 A. Yes, obviously you've got drawings sort of to follow to
- 11 get measures off of, but yes, pretty much.
- 12 In general terms, would you agree that -- tell me if
- 13 this is right or wrong -- your aim would be to provide 14 a quotation that was competitive, but also maintain as
- 15
- large a profit margin for Harley as possible?
- 16 A. Yes, it would.
- 17 Q. So when you were looking for costings, would you also
- 18 consider whether the job could be done for less money
- 19 using alternative products?
- 20 A. Possibly, but then it was really down to the NBS what
- 21 was specified in that really, so I would follow that
- 22 first -hand.
- 23 Q. Right.
- 24 Just following up on that answer, does that tell us
- 25 that you, in estimating, were confined or constrained by

6

- 1 what the NBS told you?
- $2\,$   $\,$  A. Pretty much, yeah, unless I was instructed otherwise.
- 3 Q. Who would normally instruct you otherwise?
- 4 A. That would be Ray Bailey or Mark Harris.
- Q. Generally, what would be the reasons for instructing youotherwise?
- 7 A. Well, for example, on Grenfell Tower we specified
- 8 a different window system from the specified, which was
- 9 Wicona, and we specified -- we quoted for
- 10 Metal Technology, which was a sort of product that
- Harley's worked with extensively.
- 12 Q. When doing the estimating, would it be your job to make
- 13 a selection of alternative products or simply to cost
- what you were told to cost?
- 15 A. Just cost what I was told to cost.
- 16 Q. Where you did choose alternative products, would that
- process extend to assessing whether the alternative
- products were compliant with the Building Regulations
- 19 and associated guidance?
- $2\,0\,$   $\,$  A.  $\,$  I wouldn't be choosing them, so I would just be told
- 21 what they were.
- 22 Q. I see.
- 23 Did Harley at any stage provide you with any
- 24 training or CPD to assist you with your role?
- 25 A. No.

9

- 1 Q. Right. Did you yourself undertake any training yourself
- 2 to get up to date with or familiar with the
- 3 Building Regulations, for example?
- 4 A. No.
- 5 Q. What about statutory or industry guidance?
- 6 A. No.
- 7 Q. What about best practice within the façade industry?
- 8 A. No.
- $9\,$  Q. Does that tell us that you didn't keep abreast of
- $10 \hspace{1cm} \hbox{general developments in the cladding industry?} \\$
- 11 A. I would -- yeah, I would keep abreast of it in the news
- $12\,$  or, you know, in the construction news, but I wouldn't
- actually be trained on that.
- $14\,$   $\,$  Q.  $\,$  I see. So you say construction news; does that  $\,$  refer to
- particular publications, specialist publications?
- 16 A. Yeah, like Building Magazine, Construction News, things
- like that really, but not in great detail.
- $18\quad Q.\quad Right.\quad Would you look at \ those \ regularly \ or \ just$
- whenever the fancy took you?
- 20 A. Whenever, really. It wasn't really -- it wasn't
- $21 \hspace{1cm} \text{necessary to} \hspace{0.1cm} \text{my job to} \hspace{0.1cm} \text{actually} \hspace{0.1cm} \text{keep that} \hspace{0.1cm} \text{fully} \hspace{0.1cm} \text{informed}$
- of that sort of information.
- 23 Q. Yes, I see.
- 24 Turning to your role at Grenfell, in your role as
- 25 estimator on the Grenfell Tower project, you considered

- all the elements, I think, that Harley was being asked
- 2 to subcontract and would provide a price for which
  - Harley was to do that work; is that right?
- 4 A. That's right, yes.
- 5 Q. Now, if you can go to paragraph 8, please, of your
  - statement, bottom of page 2 {HAR00010151/2}, you say:
- 7 "My involvement with the refurbishment works carried
- 8 out at Grenfell Tower was to produce a quotation for
- 9 Harley's scope of works based on the tender documents
- 10 received from the potential main contractors, which
- $11 \hspace{1.5cm} \text{included an NBS specification and architects' design} \\$
- 12 drawings.
- Would your work be done in order to tender for the
- 14 project?
- 15 A. That's right, yes.
- 16 Q. Would it be fair to say that your involvement was,
- therefore, predominantly in the pre-contractual stage?
- 18 A. Right, yes, it was.
- 19 Q. Did you receive a tender package from each of the main
- 20 contractors who were tendering for the works?
- 21 A. I believe I did, yes.
- 22 Q. And did each of those tenderers provide the
- 23 NBS specification?
- 24 A. They would have done, yes.
- 25 Q. I see, and then you would have looked at those for each

11

- 1 potential contractor?
- 2 A. Yeah, every NBS would be the same document anyway.
- 3 O. Yes, I see
- 4 Would the same apply to drawings which had been
- 5 created by Studio E at that stage?
- 6 A. Again, yes, it would be the same document.
- 7 Q. Now, when you got the tender package from the main
- 8 contractors -- well, sorry, there is a prior question.
- Do you remember how many tender packages you looked
   at from different potential main contractors?
- 11 A. I only remember from just seeing the names on the -- on
- my transcript, so that was probably the -- that was the
- 13 amount we got.
- 14 Q. At paragraph 7, I think --
- 15 A. Yes, that's right.
- 16 Q. Did you get -- I think you say you did -- a tender
- package from all or each of Rydon, Wates, Mulalley,
- 18 Durkan and Keepmoat?
- 19 A. That's right, yes.
- 20 Q. I see.
- 21 Did you provide estimates and quotations for each of
- 22 those potential main contractors?
- 23 A. I believe, from memory, that -- I think Wates may have
- pulled out before tender submission, so it would have
- been just the others.

1 Q. Right.

2 When you got the tender package from any of these 3 potential main contractors, did you form an impression, 4 when looking at them, about the nature of the documents

- 5 you were provided with? 6 A. In what way, sorry?
- 7 Q. Well, were they more or less detailed or prescriptive
- 8 than normal in your experience to date?
- 9 A. They were probably more on the high side of being, 10 you know, detailed than normal.
- 11 Q. I see. So more detailed than you would normally have
- 12 seen in the past?
- A. That's right, but NBS documents usually are quite 13 14 detailed, but the drawings were quite detailed.
- 15 Q. I see.

18

19

20

21

22

23

24

25

5

6

7

8

9

10

16 Now, I want to turn to look in a little bit more 17 detail about your involvement pre-NBS specification.

> Can we turn the page in your statement, please, to page 3 {HAR00010151/3}, paragraph 9, and you say there:

"My work on the project began in December 2013 when the tenders were received from a number of potential documents and built up a cost estimate based on the specification and drawings."

Is it quite accurate to say that your work began on

13

- 1 the project in December 2013?
- 2 A. That's right, yes, when the tender enquiries were 3 received.
- 4 Q. Well, let's just explore that a little more closely.
  - Can we please look first to {HAR00005555}. This is an email from Mark Harris to Tomas Rek at Studio E dated 1 November 2013 and it concerned pricing, as you can see down the email string, for zinc cladding, you see down the page. And it's a series of emails, and they go over this page, but you can see, running your eye up from the
- 11 bottom of page 1 up, the subject is zinc cladding.
- 12 Now, this was, as we can see from the date, before
- 13 the NBS specification was received by Harley; correct?
- 14 A. Yes.
- 15 Q. And you can see from the top email that you are copied 16 in by Mark Harris in his reply to Tomas Rek on that
- 17 date, 1 November.
- 18 A. That's right, yes.
- 19 Was this your first involvement in the Grenfell Tower 20 refurbishment project, do you think?
- 21 A. It was probably the first time I was actually aware of
- 22 the project, but I wouldn't say I was actually involved 23
- 24 Q. What caused you to be involved in the project from this 25 point?

- A. When we received the tender documents in December.
- 2 Q. That wasn't quite my question. Let me ask it
- 3 a different way.
- 4 How come you got involved at this point by
- 5 Mark Harris on 1 November 2013?
- 6 A. Right. Well, knowing that Grenfell was going to come
- 7 out for tender in December, Mark copied me in to the
- 8 emails so I could put it into the document file, just so
- 9 it was ready for, you know, my job to actually price, so
- 10 I had the information there already.
- 11 Q. I see.
- 12 Shortly before this email, we know that Mark Harris
- 13 had prepared an outline budget for Studio E following
- 14 a meeting that he had attended with Ray Bailey, and
- 15 I just want to show that to you, if I can. It's at
- 16 {SEA00002275}. This is dated 18 October 2013. Just
- 17 have a look at it, if you would, Mr Albiston.
- 18 Just looking at it there on the screen, do you 19 remember this document from the time?
- 20 Yes. I do.
- 21 Q. Do you remember whether you had any involvement in
- 22 preparing it?
- 23 A. No, I didn't.
- 24 Q. You didn't.
- 25 When was the first time, to the best of your

15

- 1 recollection, that you saw this document?
- 2 A. It was probably around the time of receiving the tender,
  - so it would have been late November, early December.
- 4 Q. I see.

3

- 5 Now, Mark Harris told the Inquiry that, Mr Albiston, 6
  - you drew this up in October 2013. Is that wrong?
- 7 A. Yes, I believe it is. As I said, I didn't have any
- 8 involvement in Grenfell Tower before December.
- 9 Q. Right. Can you explain how, without your help, Mr --
- 10 well, let me ask it again a slightly different way.
- 11 Do you know from your own knowledge who drew this 12 document up if it wasn't you?
- 13 A. It was probably Mark Harris and Ray Bailey between them.
- 14 O. Right. You say probably; how sure are you about that?
- 15 A. Probably 100%.
- 16 Q. Right.

19

- 17 Do you know where they would have got the figures
- 18 from in respect of, for example, the first item down,
  - Reynobond zinc cassette rainscreen?
- 20 A. Probably from CEP or Alcoa.
- 21 Q. Right. Okay.
- 22 Do you know from your own knowledge, looking down
- 23 the first page there, why Reynobond products were being
- 24 proposed and no other products at that stage?
- 25 I don't know, I'm afraid.

- Q. Are you able to explain why, although prices include 2 insulation, there is no insulation product referred to?
- 3 A. I think really insulation, there are different products
- 4 available which can be obviously used, so I think there
- 5 was nothing special at that time.
- 6 Q. I see.
- 7 Are you able to identify, even now, what insulation 8 product formed the basis or was included in any of these
- 9 numbers where insulation is referred to?
- 10 A. I don't know, because, you know, it just says
- 11 "insulation", so I don't know what product was actually
- 12 used there
- 13 Q. If you go to page 2 {SEA00002275/2}, I want to try one
- 14 thing out with you, if I can. You will see under
- 15 "Exclusions" towards the bottom of page 2, four entries
- 16 up from the bottom:
- 17 "No allowance for fire rated products."
- When you did first see this document, what did you 18
- 19 understand that to be referring to?
- 20 A. Sorry ...
- 21 Right, that's probably referring to windows and
- 22 curtain walling, so there's no sort of fire rated
- 23 products for that.
- 24 Q. I see.

6

7

8

9

12

13

14

15

25 Can I ask you to look at {HAR00005461}, please.

17

- 1 Now, this is an email dated 4 October from Bruce Sounes 2 of Studio E to Mark Harris copied to Ray Bailey. Now, 3 you're not copied in on it, possibly because you had 4 only just arrived at this time.
  - In the third paragraph down, it says:
    - "The clients response to your budget was 'what about aluminium?' We haven't had samples or cost back from Nedzink but this could be ideal if it eliminates the need for fabricated travs and is true zinc ..."

10 Then there is a reference to the NedZink website. 11 Then it goes on to say:

> "Would it be possible to come back with budget costs? Or what would the material cost uplift be for a Nova composite versus a metallic/faux-zinc Reynobond nanel?"

- 16 I know you're not copied in on this and you had, 17 I think, just arrived at Harley at the time, but were 18 you made aware either of this email specifically or of 19 the discussion at the time about NedZink?
- 20 A. No, I can't recall any particular discussion about it.
- 21 Q. Right.
- 22 Did Mr Harris ever ask you to source quotes for
- 23 a NedZink panel?
- 24 A. I don't believe he did, no.
- Q. Do you know why the October 2013 budget that I've just

18

- 1 shown you only contained Reynobond options when, as we
- 2 can see from this document, two weeks earlier the
- 3 architects had made it plain that they had wanted to
- 4 investigate the NedZink option?
- 5 A. I don't know.
- 6 Q. Do you know why the detailed budget spreadsheet dated
- 7 18 October, so after you had arrived, was drawn up
- 8 without your involvement?
- 9 A. Because it was at budget stage and I was working on
- 10 other projects at that time, so I couldn't actually 11 devote my time to doing that budget. As I say, I had
- 12 only just arrived, so really Mark and Ray knew budgets
- 13 that they wanted to put out for these projects.
- 14 Can we look at {HAR00005444}, please. This is an email
- 15 from Mark Harris to Tomas Rek of Studio E on
- 16 7 November 2013, as you can see, copied to Ray Bailey
- 17 and also to you, Mr Albiston. Do you see that?
- 18 A. Yes, I do.
- 19 "Good morning Tomas.
- 20 "A response has been received at last from KME, 21 although I'm not sure it tells us a great deal. All
- 22 that has been provided, is a base m2 rate for panel
- 23 only, ex-works. That must have taken all of 10 minutes
- 24 to think about, so quite why it's taken them 2 weeks to
- 25 provide it, is a mystery to me!"

- 1 Now, the KME panel that's referred to there was 2 a Proteus panel, I think, wasn't it?
- 3 That's right, yes.
- 4 Q. Yes, and in fact we can see that a bit lower down the 5 email.
- 6 Do you know why it was that Mr Harris was obtaining 7 quotes from KME for the Proteus zinc panel rather than
- 8 you, as the estimator?
- 9 A. Again, really just timescales. I was tied up with
- 10 actually doing other projects, pricing those, so Mark
- 11 was doing these.
- 12 Q. Right. Why were you copied in on this email, then, if
- 13 you were tied up with --
- 14 A. Because of my future involvement with Grenfell, actually
- 15 doing the actual tenders.
- 16 Q. I see.
- 17 Now, he goes on to say, under the reference to Proteus HR composite:
- 18
- 19 "Quite what finish this is based on, I have no idea 20 (due to lack of information). I have to say, from a
- 21 Harley selfish point of view, our preference would be to 22 use ACM. It's tried & tested (on many Harley projects),
- 23 and we are confident in the cost base."
- 24 What impact did that view of Mr Harris' have on you 25 at this time?

- A. In what way, sorry?
- 2  $\ensuremath{\mathsf{Q}}.$  Let me ask it more specifically : when you came
- 3 eventually to price the Harley work or Harley job for
- 4 Grenfell, were you influenced in your pricing as
- 5 a result of Harley's preference here as expressed for
- 6 ACM?
- 7 A. No, because the NBS was specifying the Proteus, and
- 8 I think there was options for ACM, but I was just
- 9 pricing as per the specification document.
- 10 Q. Can we go to {SEA00009997}, please. Here we can see
- 11 that, two or so weeks later on 21 November, Mark Harris
- 12 sends an email to Bruce Sounes copied to you and
- 13 Ray Bailey. Do you see that?
- 14 A. Yes I do.
- 15 Q. And that again relates to Reynobond pricing, and we can
- 16 see a little bit lower down in the email that he says:
- 17 "ACM current 'standard rate face-fixed on the wall -
- 18 £187.50 [per square metre] ...
- 19 "ACM current 'standard' rate cassette on the wall -
- 20 £232.50 [per square metre] ..."
- 21 Had Reynobond, to your knowledge, provided prices
- 22 for the Grenfell project for you to build up these
- 23 prices quoted to the client?
- 24 A. I hadn't seen any prices, but, again, I was not putting
- 25 the prices together, so I wouldn't have seen them.

- 1 Q. Again, was the reason you were copied into this email
- 2 really in readiness --
- 3 A. That's right, yes.
- 4 Q. -- for jumping on to the Grenfell job, to do the
- 5 estimation work for that?
- 6 A. That's right, yes.
- 7 Q. I see.
- 8 Can I show you another email, the same day,
- 9 {HAR00005512}, please. This is an email from
- 10 Debbie French to Mark Harris, as I say, of the same day,
- 11 21 November 2013, and it responds to an email, I think,
- 12 from Mark Harris of 8 November. So looking at
- 13 Mark Harris' email of 8 November to her, "Morning Deb",
- 14 do you see, halfway down?
- 15 A. Yes.
- 16 Q. "Bruce at Studio E has been talking with us about
- 17 options for the cladding.
- 18 "He asked us for guide rates on the following ..."
- 19 You can see there are four Reynobond finishes there:
- 20 "How much more per m2 would these colours be over
- 21 and above your standard range?"
- 22 You're, I think, copied in on that as well. It was
- 23 actually to Deborah French copied to you.
- 2.4 Do you remember seeing this email at the time?
- 25 A. I would have done, yes.

- 1 Q. Again, why were you being copied in on this? Was it
- 2 because you were being readied for the --
- 3 That's right, yes.
- 4 Q. -- eventual NBS spec?
- 5 Then we see the response from Deborah French back to 6
  - Mark Harris, not copied to you:
  - "Hi Mark
- 8 "As discussed and sorry for the delay.
- 9 "For the colours shown below we would offer an
- 10 approx rate to our approved fabricators of £32.00 -11 35.00m2
- 12 "Let me know if you need any other details ."
- 13 Do you know -- and I know you didn't necessarily --14
- well, first of all, did you see this email at the time 15 or did you discuss it with Mr Harris at the time, do you
- 16
- 17 A. I wasn't copied in. It may have been something I might
- 18 have been forwarded or a printed copy may have been
- 19 given over to me.
- 20 Q. Right. Does it ring a bell with you?
- 21 A. I am afraid I can't recall.
- 22 Q. Okay.
- 23 Do you know why these quotations had been obtained
- 24 by Mr Harris at this stage now -- we're three-quarters
- 25 of the way through November -- and not by you, as the

23

- 1 estimator?
- 2 A. Because I was, again, pricing other projects at the
- 3 time.

5

- 4 Q. Right. Okay.
  - So how much positive involvement did you have?
- 6 We've seen you receiving a number of emails, but how
- 7 much proactive involvement did you have on material
- 8 choice at this stage or by this stage?
- 9 A. No involvement at all, just -- rather than just --
- 10 I just received the emails, copied in. As I say,
- 11 I didn't properly look at Grenfell Tower until December.
- 12 Q. On what you could see, is it fair to say that, even
- 13 before the NBS specification was received as part of the
- 14 tender package, Harley was already giving input into the
- 15 products that should be specified, particularly in
- 16 relation to the rainscreen?
- 17 A. I think they were after options and different rainscreen
- 18 products, so that's what they were responding to.
- 19 Q. Right.
- 20 Was it your impression that Harley, and particularly
- 21 Mr Harris, was aiming to get Reynobond ACM included in
- 22 the NBS specification?
- 23 I don't think so, no.
- 24 Were you aware that an FR core was available for
- 25 Reynobond ACM products?

1 A. No.

6

7

8

9

10

19

2 Q. Can we go back to your statement, paragraph 9, please,

3 page 3 {HAR00010151/3}, and I want to look a little bit

4 more closely with you, please, at the obtaining of

5 quotes by you. You say at paragraph 9:

"My work on the project began in December 2013 when the tenders were received from a number of potential documents and built up a cost estimate based on the

specification and drawings." 11 We looked at that earlier on.

12 Would you agree that you needed to ensure that the

13 information was appropriately extracted from the

14 drawings and the specification in order to be able to

15 price the project reliably?

16 A. That's right, yes.

17 Q. And you would need to raise queries regarding specific

18 elements or to clarify anything if there was anything

there you didn't understand?

20 A. That's right, yes.

21 Q. If that was so, who would you go to, who would be your

22 first port of call?

23 A. As I say, probably Ray Bailey or Daniel Anketell-Jones,

24 being the technical manager.

25 Q. I see. Daniel Anketell-Jones, was he involved on this

1 project by the time you came to be involved more closely

2 in December 2013?

3 A. I believe he had a -- obviously a brief input into it,

4 but not in a full -on role at that stage.

5 Q. Right, I see.

6

7

11

14

Now, we can see that you began asking for quotations

or seeking quotations for various products in the

8 NBS specification on 11 December 2013.

9 Can you look at {SIG00000139}, please. This is

10 an email from you, Mr Albiston, to Matthew Irving, and

he is at SIG, isn't he?

12 A. That's right, yes.

13 O. Or was.

I'm so sorry, I think in fact he is at KME,

15 actually. Sorry, I've put that to you wrong. He is

16 KME. Is that right?

17 A. That's the -- yeah, the Proteus cladding, isn't it?

18 Q. Yes.

19

20 Was this email the first email or first message sent out

21 by you from Harley in order to seek quotations for

22 rainscreen --

23 A. It possibly could be, looking at the dates, yes.

24 Q. Right.

25 Now, if Mr Harris had already obtained a budget 1 price from KME, as we've seen he did on or before

2 7 November 2013 -- we saw that email earlier on -- do

3 you know why you were sending this request again?

4 Because we had the drawings and an NBS specification

5 now, and I just thought I would put it out there again

just to make sure it was all as the drawings and

7 specified.

6

13

8 Q. Indeed. In the second paragraph, you say:

9 "Previously, you've given budget prices to

10 Mark Harris. In order for you to provide a firm 11 quotation for the rainscreen, what do you need from us?

12 I've attached elevation drawings and the NBS

specification for now."

14 And we see that you do attach those documents.

15 So was this you seeking a firm quotation as opposed

16 to really an estimate?

17 A. That's right, yes.

18 Q. I see.

19 Did you need to get KME to see the technical data in

20 order to be able to get a firm quote from them?

21 A. That's right, yes.

22 Q. Right. And that meant, did it, that you yourself needed

23 to understand the technical data?

24 A. Not myself, no. No.

25 O. Right.

3

27

1 Now, we can see you approaching KME here directly

2 for a quotation rather than going via a fabricator. Is

that right, first of all?

4 A. I believe KME actually fabricated as well, so the prices

5 for cladding would have come straight from them.

6 Q. I see. I was going to ask you, when considering the

7 Proteus HR panel, is that something that actually needed

8

9 A. I believe it did, yes, it was a similar sort of cladding

10

11 Q. I see, but I think you are telling us that KME supplied

12 them ready fabricated?

13 A. That's right, yes.

Q. Did they supply them ready fabricated in both cassette 14

15 and face-fixed form?

16 A. I can't recall.

17 Q. If we look at the quotation for the Proteus panel, this

18 is at {SIG00000042}, please.

19 This is dated 14 January 2014, we can see that from 20 two places at the top of the page there, and it would

21 expire on 14 February 2014, and it comes to Harley.

22 You're the customer contract reference. Do you see

23 that?

24 A.

25 Q. If we go to page 2 {SIG00000042/2} of this document, if

26

- 1 you look at the bottom right-hand corner, you can see 2 that the total price in pounds for essentially a zinc 3 system, Proteus, was £546,264.
- 4 Was that the price that you used to generate 5 Harley's quotation so far as it was based on the Proteus 6 panels?
- 7 A. I can't recall without actually seeing my pricing 8 documents, but if I can just see the previous page 9 again, if possible.
- 10 Q. Yes, go back to page 1 {SIG00000042/1}, please, if we 11 could. You can see the build-up here, "Scope of
- 12 supply", zinc spandrel cladding and zinc column crown 13 panels.
- 14 A. Yeah.

4

5

6

7

8

9

10

11

12

13

14

- 15 Q. And it's all Proteus HR panels, flat.
- 16 A. Will you just move up slightly? Sorry.
- 17 Q. Move up slightly, would that --
- 18 A. That's it, that's fine, thank you.
- 19 I'm pretty sure it would have been based on that, 20 really. I may have just re-measured the areas, but it
- 21 would have been based on these rates.
- 22 Q. It would have been, okay.
- 23 Just to be clear, if you go to {RYD00002607}, this 24 is the quotation that Harley eventually gave Rydon.
- 25
- Now, we can see it 's 29 January 2014, so exactly halfway

1 between the date of issue and the date of expiry of the 2. KME quotation.

> If we go to page 9 {RYD00002607/9} in that document, we can see there is a cost summary there, and we can see what you have quoted for the zinc column cladding and crown, zinc rainscreen cladding to spandrel panels and aluminium rainscreen cladding generally, three figures there in the middle of that cost summary: for the zinc column cladding and crown, £551,000-odd; for the zinc rainscreen cladding to spandrel panels, £707,000-odd; and aluminium rainscreen cladding generally, £109,000-odd. That gives us a total, on our calculations , of about £1.2 million . So we go from £546,000 guoted by KME to £1.2 million-odd guoted in

15 total to Rydon. 16 Can you explain in rough terms how you got from 17 £546,000-odd to £1.2 million in total?

- 18 A. Well, basically, the cladding quote was for the panels 19 and sort of brackets, but then we would have to add on 20 insulation and some cladding rails as well, and also the 21 installation of the product as well.
- 22
- 23 A. Plus the overheads and mark-up from Harley on that, so 24 that would account for that extra cost.
- 25 Q. I see. So your price of £1.2 million-odd in total for

- 1 that was an on-the-wall price --
- 2 A. That's right, yes.
- 3 Q. -- whereas the quotation from KME was what they call
- 4 ex-works, but already fabricated.
- 5 That's right, yes.
- 6 Q. But just for the materials?
- 7 A. That's right, yes.
- 8 Q. I follow.
- 9 Can we go back to your witness statement, please,
- 10 page 4 {HAR00010151/4}, paragraph 16. You say there: 11 "Decisions on specification changes were made by
- 12 Studio E, and communicated to Harley via Rydon. My
- 13 instructions to provide costings for such changes would
- 14 come to me from Ray Bailey or Mark Harris, although
- 15 ultimately we would provide alternative costings for
- 16 whatever material the architects wanted to use, provided
- 17 that it was something that was achievable and fit for 18 the intended purpose."
- 19 We can see those words there that you use.
- 20 Would you play any part in assessing whether the
- 21 products were fit for their intended purpose?
- 22 No, I wouldn't.

3

- 23 Did anyone at Harley have that particular role?
- 24 A. Again, it would have been probably Ray Bailey or
- 25 Daniel Anketell-Jones in a technical role.

- 1 Q. If Mark Harris or Ray Bailey told you to price
- 2 a particular product, did you understand that it had
  - been checked in order to make sure that it was suitable?
- 4 A. Yes, I would have done, yes.
- 5 Q. Who did you think would do that checking?
- 6 A. Either Ray Bailey or Daniel Anketell-Jones.
- 7 Q. I see. So was it your expectation that anything in the
- 8 NBS specification would be checked by Ray Bailey or
- 9 Daniel Anketell-Jones for its suitability for
- 10 application on this project?
- 11 That's right, yes.
- 12 Right. And by "fit for intended purpose", can you
- 13 explain what you mean?
- 14 A. Really just if it's actually suitable for its use on
- 15 a building.
- 16 Q. Did that include fitness from a fire safety perspective?
- 17 A. If it was -- if that was the purpose for it, but again,
- 18 you know, if it was actually for that purpose, it would
- 19 obviously have to be fit for that purpose.
- 20 Q. When you say "if it was for that purpose", can you
- 21
- 22 A. For example, if it was like a fire exit on a building
- 23 and it needed to be a fire rated screen, a curtain wall
- 24 screen, it would have to be fit for that purpose.
- 25 Q. Was it your expectation that any particular product for

- 1 application on the project would be checked by either
- 2 Ray Bailey or Daniel Anketell-Jones?
- 3 A. That's right, yes, it would be.
- 4 Q. For fire safety?
- 5 A. I suppose so, yes, it would be all part of it.
- 6 O. Right.
- 7 Now, at paragraph 31 of your statement, if we can go 8 to that, please, you will see on page 8 {HAR00010151/8} 9 there that you say:
- 10 "I have been an estimator for over twenty years 11 pricing projects involving curtain walling, windows and 12 cladding. Although I had not used these particular 13 products before, I had previously worked on projects
- 14 where other ACM products, such as Alucobond were used.
- 15 When I worked for Astralite, they used a fabricator
- 16 called Booth Muirie Limited, and they mainly worked with
- 17 Alucobond.
- 18 Now, I think you're referring there, are you -- or 19 are you? -- to Reynobond ACM with a PE core when you say
- 20 "these particular products"?
- 21 A. That's right, yes.
- 22 Q. Are you also referring, when you say "these particular
- 23 products", to the KME Proteus HR?
- 24 A. Yes, as well, yes.
- 25 So you had never used that before either?

- 1 A. No.
- 2 Q. I see. What about Celotex RS5000 insulation?
- 3 A. Again, I think I actually say in my statement at 33 that
- Δ I can't remember if I actually worked on a project where
- 5 that was used. But again, at tender stage or estimating
- 6 stage, insulation is fairly generic, so it would have
- 7 been decided after a contract was won and actually
- 8 materials ordered.
- 9 Q. Very well. Well, we'll come back to RS5000 shortly,
- 10 I think.
- 11 You say that, as you do here, you had worked with
- 12 Alucobond products. On those previous projects where
- 13 you had done so, were they Alucobond ACM panels with
- 14 a PE core or another kind of core?
- 15 A. I can't recall, I'm afraid, sorry.
- 16 Q. Right.
- 17 Were you aware from the involvement you had had
- 18 previously with Alucobond that Alucobond ACM panels came
- 19 with an FR, fire retardant, core?
- 20 A. No.
- 21 Q. What about a mineral core? Were you aware that
- 22 Alucobond panels came with that?
- 23 A. No, I just thought that Alucobond was just one core and

34

- 2.4 that was it.
- 25 Q. One core --

- A. Yeah.
- 2 Q. -- and that was it, and that was PE, was it?
- 3 A. Yeah, it wasn't a choice between fire rated or
- 4 non-fire rated as such.
- 5 So just PE as a --
- 6 A. That's right, yeah.
- 7 O. -- single product?
- 8 Now, if, as you say, these products that you have
- 9 identified were new to you, did it occur to you that it
- 10 was even more important to familiarise yourself with
- 11 them and particularly their performance in a fire?
- 12 No, because it wasn't my role at the company to actually
- 13 check those items.
- 14 Q. Right. Just again to be absolutely crystal clear, whose
- 15 role at the time did you think that was?
- 16 It would have been again Ray Bailey or
- 17 Daniel Anketell-Jones.
- 18 Q. I want to ask you some questions about the regulatory
- 19 requirements, but these may not take long.
- 20 In general, were you yourself familiar with
- 21 schedule 1 to the Building Regulations?
- 22 A. No.
- 23 Q. Right. Would it follow that you weren't therefore
- 24 familiar with part B, fire safety?
- 25 That's right.

35

- 1 Q. No.
- 2 Had you received any general training on fire safety
- 3 within clad buildings either before or during your time
- 4 at Harley?
- 5 A. No.
- 6 Q. Do I take it also that you were not familiar with the
- 7 CWCT guidance or technical notes published by the CWCT?
- 8 A. That's right, yeah.
- 9 And similarly the BCA, the Building Control Alliance?
- 10 A. Yeah.
- 11 Q. Right.
- 12 Let's turn to the NBS specification. If you go,
- 13 please, to {SIG00000139}, please, we can see an email
- 14 from you on 11 December to Matthew Irving at KME. We've
- 15 looked at that before. We can see in it that you
- 16 forwarded to him a number of documents. One of those. 17
- if we look at your email in the second paragraph and at 18 the attachments, is the NBS specification.
- 19 Now, the version then in circulation was dated
- 20 29 November 2013, and I don't need to go to that, but do 21 you remember when you first saw the NBS specification
- 22 prior to sending this email to Mr Irving?
- 23 It probably would have been when we received the tender 24 enquiries in December.
- 25 I see. Do you remember who you received it from?

Q. Right.

2 O. I see. 3 A. So Rydons, et cetera. 4 Q. I see. So when you say the NBS specification, which 5 you're sending on to KME, you don't know which 6 particular main contractor had supplied that one to you, 7 they were all the same? 8 9 sent it to KME. 10 Q. I see. 11 Now, let's look at the NBS specification. This is 12 the one dated 29 November 2013, so this would have been 13 the one current at the time of this email. It's 14 {SEA00000153}, please. 15 We can see, if you look at the middle of page 2 16 {SEA00000153/2} that this is the version dated 17 29 November, as I say. Do you see that? 18 19 see on 64, clause 120, "Type(s) of rainscreen cladding", 20 and it sets out the specification which required pricing 21 for Proteus panels supplied by KME Architectural 22 Solutions; do you see that? 23 A. Yes, I do. 24 Q. If we go back a page to 63 {SEA00000153/63}, clause 11, 25 under "H92 Rainscreen cladding", "Information to be 1 provided with tender", you can see that it says: 2 "In addition to the cladding specified in the below 3 clauses 120 & 123 submit comparative supply and install 4 costs per m2 of the whole cladding system for the 5 following alternative materials ...' 6 Then we can see what the alternatives are: there is 7 Reynobond in three finishes; Alucobond, Spectra, Sakura; 8 and zinc, Quartz Zinc. Do you see that? 9 A. Yes. I do. 10 Q. That's in addition to the Proteus panel which we saw 11 specified at clause 120. 12 Now, if we stay on page 63, at the top of that page, 13 you can see that it says that one of the matters to be 14 read with the preliminaries, in the second bullet point,

A. It would have been the main contractors.

A. No, I would have just extracted that part of the NBS and If we go then on to page 64 {SEA00000153/64}, we can 15 16 "The manufacturers noted within this specification 17 are indicative ..." 18 And then it says: 19 "... and may be substituted with similar or equal 20 alternatives." 21 When you got this document in December 2013, did you 22 note what it said there, that the manufacturers may be 23 substituted with similar or equal alternatives? 24 A. I possibly did. That's like a fairly standard clause in

Q. I see. What did you understand by the word 2 " indicative "? 3 A. It's like a guide, the sort of product that the 4 architect wants to use.

6 When it says, "The manufacturers noted within this 7 specification are indicative", did you think that 8 applied only to the KME Proteus HR rainscreen, or also 9 to the alternatives, the Reynobond, the Alucobond, and 10 the zinc?

11 A. I don't think I had an opinion on that at the time, 12

13 O. I see. 14 Looking at the phrase "similar or equal", what did 15

you understand by that? 16 A. That normally means that the product's got to be of 17 similar performance.

18 Q. Similar performance. So did that mean that, where 19 a product was to be substituted, it had to be of similar 20 or equal performance standard to what was stipulated?

21 A. That's right, yes. 22

Q. And where it says "substituted", what did you understand 23 could be substituted for what?

24 A. Sorry, in what way?

25 Well, did you understand that, for example, the

39

1 Reynobond identified in clause 11 could be substituted 2 for the Proteus, provided it was of similar or equal 3 performance standard? 4 A. Not as such, because the Proteus was the main product

5 and the Reynobond was the alternative, so it would be 6 the other way around, really.

7 Q. Right. So to what products would the qualification, to 8 your understanding, "similar or equal" apply to?

9 A. Probably from the phrasing in the document it's for any 10 product, really.

11 Q. I see. So any product not within the specification at 12 all?

13 A. Sorry?

14 O. Any product completely outside this specification?

15 A. No, well, it's referring to the products in the 16 specification, and obviously there are -- you know, 17 could be substituted by other manufacturers.

18 Q. Can I just see if I can get your understanding of the 19 comparative performances as between the zinc Proteus on 20 the one hand and the alternative Reynobond on the other.

21 Looking at the expression "may be substituted with 22 similar or equal alternatives ", did you form any view at 23 the time as to whether Reynobond would perform the same 24 as the KME Proteus HR?

25 A. No, I can't comment on that because, as I say, I've got 40

NBS documents.

38

- 1 no technical training of those products.
- 2 Q. Right.
- 3 In respect of all of these rainscreen materials that
- 4 you were being asked to cost, did you take any steps to
- 5 ensure that they were suitable for use in an external
- 6 wall construction above 18 metres in height?
- 7 A. No, other than just passing on the document to either
- 8 the manufacturers or Ray Bailey and
- 9 Daniel Anketell-Jones to actually look at the technical
- 10 point of view.
- $11\,$  Q. Again, does the same apply in relation to the insulation
- material that was specified elsewhere in this document?
- 13 A. That's right, the whole document basically, yes.
- 14 Q. Did you discuss these materials with anybody when
- 15 costing them?
- 16 A. At Harley?
- 17 Q. Within Harley, yes.
- 18 A. Possibly, yes.
- 19 Q. Do you know who?
- 20 A. Probably either Mark Harris, Ray Bailey or Daniel.
- 21 Q. Right. Do you have a specific recollection of that?
- 22 A. No, because, you know, it happens on most projects,
- 23 so ...
- 24 Q. I see.
- 25 Can you go to paragraph 22 of your statement,

- please, on page 6 {HAR00010151/6}. I think you say there:
- 3 "Beyond that, I am unable to comment as to the
- 4 manufacture of either Reynobond ACM or Celotex, because
- 5 my role was not a technical or design role, and so
- 6 I wasn't required to know the full details of the
- 7 manufacture or composition of these products."
- Does that tell us that you weren't able to assess
  whether they were fit for purpose, at least in terms of
- 10 fire safety?
- $11\,$  A. That's right, because as I say, it wasn't my role at the
- 12 company to do those checks.
- 13 Q. Okay.
- Can we go back, then, to clause 11 of the
- NBS specification that we looked at a moment ago,
- 16 {SEA00000153/63}. This is the NBS specification of
- 29 November again, not the final version that came out
- in January that we have been looking at most of the time
- in this inquiry.
- 20 We can see here on this page, under clause 11
- $21\,$  "Information to be provided with tender", that you were
- required to provide a price for Reynobond metallic
- 23 standard and non-standard.
- What did you understand was the difference between

42

25 standard and non-standard?

- 1 A. It's basically the finish of the -- of the metallic
- 2 finish, either standard or non-standard. I think they
- 3 have a range of colours which are standard colours, and
- 4 then you get non-standard colours which are -- sometimes
- 5 cost -- cost on those.
- 6 Q. Can I ask you to look at the BBA certificate for
- Reynobond panels. This is at {HAR00000934}, please.
- $8\,$   $\,$   $\,$  This is the BBA certificate  $\,$  number 08/4510, first issue,
- 9 dated 14 January 2008.
- Did you see this document when considering how to
- 11 quote for these panels, the Reynobond ACM panels?
- 12 A. No
- 13 Q. Did you ever see this document during your work on the
- 14 Grenfell Tower project?
- 15 A. I believe it was provided by Alcoa on request from the
- architects later on, but again, it would just be --
- I was just copied in on an email and the document sent
- on to the architect.
- 19 Q. Yes, that's 23 April 2014, sent by Debbie French to
- 20 Mark Harris. Does that ring a bell with you?
- 21 A. Yes, it does.
- Q. You say you were copied in on that; did you read it when
- 23 you received it?
- 24 A. No.

3

6

25 Q. What did you do with it?

43

- $1\,$  A. I was just copied in to it, so I didn't actually --
- 2 I just filed it and, as I say, Mark Harris sent it on,
  - I believe, or it may have been myself, I can't remember.
- 4 Q. Why did you think you were being copied in on it?
- 5 A. Because, again, I was the point of contact for the
  - pricing at Grenfell Tower, so I was copied in on all
- 7 documents at that point.
- 8 Q. Did it occur to you that one of the reasons why you were
- 9 copied in on it is that you should read it?
- 10 A. No, because, again, my role wasn't that at the company,
- wasn't a technical role, so I would not have to read
- 12 that document.
- 13 Q. What was the point of it being sent to you if you
- 14 weren't to read it?
- 15 A. Again, because it was a -- just keeping me in the loop,
- basically, and I kept a file of all correspondence on
- the project.
- 18 Q. Right.

21

- Now, I know you didn't read this document at the
- $20\,$  time, as you tell us, and perhaps there is not a lot of

point showing this to you, but the general question is:

- were you aware, even at April 2014, when this document
- was sent to you in copy, that there were two different
- 24 Reynobond ACM products, one with a standard PE core and

44

one with an FR or fire retardant core?

- A. No, I wasn't aware.
- 2 Q. Right.
- 3 Can we then look at {SEA00002275}, please. This is
- 4 a document we looked at earlier on this morning. It was
- 5 the 18 October outline budget for the external envelope,
- 6 "budget costs (cassette rainscreen)".
- 7 At this stage you can see that cassette is being
- 8 quoted for. Do you know why cassette was stipulated at
- 9 this stage rather than face-fixed, or rather budgeted
- for rather than face-fixed?
- 11 A. No, I don't know.
- 12 Q. If you go to page 2  $\{SEA00002275/2\}$ , we looked at the
- exclusion for fire rated products and you said that was
- 14 for curtain walling and windows. Did you understand,
- from your involvement, that there had been an exclusion
- from the budget for all fire rated products?
- 17 A. In what regard?
- 18 Q. Well, fire rated products in the external wall
- 19 construction.
- 20 A. I wasn't aware, no.
- 21 Q. Okay. Nobody ever told you to budget or cost on the
- 22 basis that fire rated products, for example for the
- rainscreen or for the insulation, were not to be costed?
- 24 A. What, on this particular document or in future projects?
- 25 Q. On this project.

- 1 A. On this project, no.
- 2~ Q.  $\,$  Can I  $\,$  then go to  $\,$  {CEP00000267}, and I'm going to ask you
- $3 \qquad \quad \text{some questions about your seeking of a quotation from} \\$
- 4 CEP.
- 5 A. Okay.
- 6 Q. This is an email of 21 January 2014 from Geof Blades at
- 7 CEP to you, copied to Mark Harris, in which he provides
- 8 a quotation for the fabrication of the cladding panels,
- 9 and he attaches a quote.
- 10 A. Okay.
- $11\,$   $\,$  Q.  $\,$  It  $\,$  looks from our documents that you only approached CEP  $\,$
- $12 \hspace{1cm} \text{for a quotation for fabrication} \, . \hspace{1cm} \text{Is that right?}$
- 13 A. I believe so, yes.
- 14 Q. Why is that?
- 15 A. Because CEP was the fabricator Harley used for the
- 16 rainscreen cladding products.
- 17 Q. Is that all rainscreen cladding products, regardless of
- whether it was Reynobond or Alucobond or others?
- $19 \quad \text{A.} \quad I \ \, \text{think} \, \, \text{--} \, \, I \ \, \text{believe} \ \, \text{it} \ \, \text{was probably Alucobond,}$
- $20 \hspace{1cm} \hbox{Reynobond, maybe some other cladding products.} \\$
- 21 Q. Right. So CEP was the fabricator of choice for Harley,
- is that what you are saying?
- 23 A. That's right, for those products, yes.
- 24 Q. You say "for those products", can I just check what you
- 25 mean?

- 1 A. Yes, I believe obviously there's products they didn't
- $2 \hspace{1cm} \text{actually} \hspace{0.2cm} \text{fabricate} \hspace{0.1cm} \text{, so they couldn't actually provide} \\$
- 3 prices for those.
- 4 Q. Would it be normal only to approach one fabricator on
- 5 a cladding job?
- 6 A. Not particularly, no.
- 7 Q. So why on this one?
- 8 A. I think at that point, you know, I was new to the
- 9 company and you rely on being told who the companies
- 10 that the -- you know, your employer uses, so I was told
- that CEP would provide a price for these, so that's who
- 12 I went to.
- 13 Q. I see. Who told you that?
- 14 A. It would have been either Ray Bailey or Mark Harris.
- $15\,$   $\,$  Q.  $\,$  Okay. Did they say why you should approach CEP and
- 16 nobody else?
- 17 A. No, really, just, you know, you get a list of suppliers
- that Harley used over the years and that's the companies
- 19 you went to.
- 20 Q. And you didn't question that?
- 21 A. No, because most times, even in my previous employment,
- you know, you build up a level of trust with certain
- suppliers, they deliver on time, you know, they're
- 24 trustworthy in terms of, you know, providing a product,
- so you just really go with those, the ones that you can,

47

- 1 you know, you can trust basically.
- Q. Did CEP only fabricate ACM panels?
- 3 A. What, in terms of cladding or ...?
- 4 Q. In terms of the rainscreen. I'm sorry, yes, when it
- 5 comes to rainscreen panels, did CEP only fabricate ACM
- 6 or did they do other panels?
- 7 A. I believe they did other panels, maybe a sort of --
- 8 I can't remember what it is, might be a HPL panel,
- 9 I think it is, but it was really ACM was the one we
- 10 obviously got quoted on this.
- 11 Q. HPL being high-pressure laminate?
- 12 A. Yes, that's right, yes.
- $13\,$  Q. As far as zinc is concerned, I think you said earlier
- that that would be fabricated by KME itself.
- 15 A. That's right, yes.
- 16 Q. So that wouldn't need to go to CEP?
- 17 A. I don't believe they actually did that product anyway,
- 18 so ...
- 19 Q. Right.
- 20 So would it be right that by only approaching CEP
- for a quote, you were essentially providing a price
- which assumed the rainscreen for Grenfell Tower was
- 23 going to be ACM?
- $24\,$   $\,$  A. No, because the ACM was an alternative to the Proteus at
- 25 that point.

1 Q. Right.

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

Can we look at the email chain under which you requested a quote. It's {CEP000000267/3}, please. If we go down to page 3, we can see that, at the bottom of the chain, there is an email from Geof Blades to you dated 20 December 2013:

"Morning Mike,

"Following my telephone conversation with
Mark Harris yesterday, could you please forward your
window and curtain wall schedule. With regards the
rainscreen overcladding we are to offer our system based
on a cassette tray and face fixed ACM ie Reynobond, to
this could you please forward elevation drawings and any
other information you feel is relevant."

Were you made aware of that telephone conversation on 19 December, the day before this email?

- 17 A. Other than just seeing it in the email there, I don't18 recall this conversation, no.
- 19 Q. Do you know what Mr Harris said to Mr Blades?
- 20 A. No, I don't.
- Q. To your knowledge, did Mark Harris instruct Geof Blades
   to offer a system, as he says, based on a cassette tray
- and face-fixed ACM, ie Reynobond?
- 24 A. I don't know, other than reading it in the email there.
- 25 Q. Did you instruct Mr Blades to offer such a system?

49

- $1\,$   $\,$  A. No, because I think probably on the email further on,
- 2 I just -- and you just sort of scroll up.
- 3 O. Right.
- 4 A. But basically he says cassette tray and face-fixed so5 I think that's what he offered.
- 6 Q. Do you know, because you received this at the time, why
- 7 Mark Harris had told Geof Blades that the ACM to be used
- $8\,$  was Reynobond and not any of the other alternatives  $\,$  set
- 9 out in the NBS specification?
- 10 A. I don't know.
- $11\,$   $\,$  Q.  $\,$  Did it  $\,$  strike you as odd that he had narrowed down the
- $12 \hspace{1cm} \text{quotation that he was seeking only to that product and} \\$
- 13 not, for example, to include Alucobond as
- 14 an alternative?
- 15 A. Not really, no. At that point I was, as I say, new to
- the company, so I don't think I had met Geof Blades, so
- 17 I didn't actually know what products CEP fabricated, so
- it wouldn't have struck me as unusual.
- $19\,$   $\,$  Q. When you read the words "we are to offer our system",
- 20 did that strike you as a reference to an instruction,
- that was being sought was very specific and restricted
- 23 to cassette and face-fixed, ie Reynobond?
- 24 A. Not really, no. No.
- 25 Q. Can we then scroll up and look at pages 2

1 {CEP000000267/2} and 3 {CEP000000267/3} side by side.

- 2 If we look at the bottom of page 2, and the top of
- 3 page 3, we can see that it's an email from you dated
- 4 6 January 2014 back to Geof Blades, and over the top of page 3 you say --
- 6 A. Sorry, I can't see the --
- $7\,$   $\,$  Q. No, there it is , top of page 3, "Hi Geof", do you see
- 8 that now?
- 9 A. Yes, I do.
- 10 Q. You say:

11

"Hi Geof

"Further to our telephone conversation this morning
please find attached schedules and NBS specifications
for the curtain wall and windows.

"I have also included the NBS specification for therainscreen and the elevation drawings. I will also send

you a link for further drawings in Dropbox.

"If you have any queries, then please contact me."

Did you have a conversation with Geof Blades on the morning of 6 January 2014, as appears from this email?

- 21 A. I obviously did, yeah, if it says in the email.
- 22 Q. Do you remember that conversation?
- 23 A. No, I don't.
- $24\,$   $\,$  Q.  $\,$  Do you remember whether you told him, or do you have
- a recollection specifically of telling him what to quote

51

- 1 for in respect of the rainscreen?
- A. No, I don't remember. Again, he said previously what hewas going to be quoting for, so I didn't really raise
- 4 that with him.
- 5 Q. Right.

6 Now, you had sent him the entire NBS specification

7 and the elevation drawings, and we've already seen that

8 the NBS specification requested quotes for four

9 rainscreen products, Proteus, Reynobond, Alucobond and

10 Quartz Zinc by VMZinc. So were you expecting him to

11 provide quotations in respect of all of those, or at

 $12 \hspace{1cm} \textbf{least Reynobond, Alucobond and Quartz Zinc at this} \\$ 

13 stage?

- $14\,$  A. Probably -- well, whatever he could quote for, really .
- 15 If he quoted for Reynobond, it would have just been

16 that.

Q. If we go then to the quote of 21 January 2014, which is
what he responds to, after a chaser from you, which
I think we can see on page 2. Can we go to that, it's

20 {CEP000000268}. This is the formal quotation from CEP, addressed to you at Harley, dated 21 January 2014.

22 If we look at page 1, it says in the first

paragraph:Thank you for your enquiry ref the above

"Thank you for your enquiry ref the above project [which is Grenfell Tower] and, we have pleasure in

52

confirming our quotation for the design, fabrication and 2 supply only of aluminium windows and rainscreen 3 overcladding, as laid out below." 4 Then in the fifth paragraph down, "Rainscreen 5 Overcladding", do you see that? 6 A. I do, yes. 7 O. "Panels are to be manufactured utilising 4mm Reynobond 8 9 I just want to focus on the words "are to be 10 manufactured". 11 Do you know why, despite the fact that you had sent 12 Mr Blades the whole of the NBS specification, which had 13 the four products, Proteus and then the three 14 alternatives, in it --15 A. Yes. 16 Q. -- clause 11, as we've seen, do you know why Geof Blades 17 only provided a quote for the Reynobond ACM product? 18 A. I assume it's because that's the only product he 19 actually fabricated in terms of ACM rainscreen. 20 Q. Is it not because he had been told to do so, as we've 21 seen from the 20 December email, "we are to"? 22 A. I don't know if he was told that or not, I just assume 23 that's what he was -- that's his product he fabricates. 24 Q. You see, it says here: 25 "Panels are to be manufactured utilising 4mm 53 1 Reynobond ACM." 2 When you saw this, did it not strike you as odd that 3 he was under the impression that he was only to quote 4 for 4-millimetre Reynobond ACM and not any of the other 5 products referred to in the NBS specification? 6 A. No, it didn't strike me as strange. 7 Q. It didn't strike you as strange? 8 A. No. 9 Q. Why didn't it strike you as strange? 10 A. Because that's obviously the product -- he only 11 fabricates that type of ACM. 12 Q. So did you understand that he was limiting himself to 13 quoting for a Reynobond ACM because that was the only 14 product he fabricated? 15 A. That's right, yes. 16 Q. Did anyone tell you that? 17 A. I can't remember if they did or not, but that's the --18 that's my memory of it, basically, that's the product he 19 fabricated. 20 Q. Right. Did you have a conversation with him about his 21 capability to fabricate other products, such as 22 Alucobond?

1 Did it not cross your mind that when he was restricting 2 himself to Reynobond, that was over- restrictive and you 3 should ask him, "Can you please quote for Alucobond as 4 5 A. Well, you have just told me now that he quotes for 6 Alucobond, so that's probably the first time I knew that 7 anyway, or at the time I wouldn't have known that. 8 Q. All right. 9 It looks from his wording -- and obviously we can 10 ask him about this -- "panels are to be manufactured", 11 as if a final decision had been made already to use 12 Reynobond ACM as the fabricated panels as opposed to 13 Alucobond or any other panels requiring fabrication . 14 Does that accord with your recollection, that a final 15 decision had been made? 16 A. No, no, at that stage it was as an alternative to the 17 Proteus anyway. 18 Were you asked to obtain quotations for Alucobond? 0. 19 I can't recall, I'm afraid. 20 What about VMZinc? 21 A. It's possible. Again, I can't recall. 22 Q. Right. 23 Given that you didn't approach any fabricators other 24 than CEP, as you have told us, and given that you only 25 asked CEP or at least led CEP to understand that it was 1 only to quote for Reynobond, does it follow that in fact

2 there were no quotations sought from fabricators for 3 Alucobond? 4 A. Again, I can't recall. 5 Would the same apply to the VMZinc as well?

6 A. That's right, yes.

7

Q. From your own recollection, is it fair to say that 8 Harley was pushing the Reynobond product and was seeking 9 quotations based on its proposed use at Grenfell?

10 A. No, I don't think that at all.

11 Q. Right.

12 Can I ask you to look at {CEP000000273}. Now, this 13 is an email from Mark Harris to Geof Blades of 14 29 January, copied to you. He says:

15 "Hi Geof

16 "Just to let you know, the main contractor tender 17 return date has been further extended by another week 18 14th Feb. So glad we pulled out all the stops to get a 19 price back!!"

20 Were you working against a tight timescale to 21 prepare the tender for submission? A. Not particularly, it was just about usual for those sort

22 23 of projects.

24 Right. Did you feel under pressure to get the Q. 25 quotations out as soon as possible?

I think we know that CEP also fabricated Alucobond.

A. It's possible I did but I can't recall that.

54

Q. Right.

23

24

25

- 1 A. No more than usual, really .
- Q. No more than usual, but nonetheless some degree ofpressure?
- 5 pressure?
- 4 A. Yeah, that's usual, yeah.
- 5 Q. Let's look at Harley's quotation itself, please,
- 6 a little more closely. At  $\{HAR00010151/4\}$  is your
- 7 statement at paragraph 13. You say here:
- 8 "A quotation was produced by myself and agreed with 9 Ray Bailey and Mark Harris. The quotation ... was sent
- 10 to all potential main contractors. Rydon were
- $11 \hspace{1cm} \text{ultimately awarded the contract, and } I \hspace{1cm} \text{assisted}$
- 12 Mark Harris with providing additional costings and cost
- 13 analysis."
- Do you see that?
- 15 A. Yes.
- 16 Q. You go on to say:
- $17\,$  "By further cost analysis I mean breaking down the
- 18 costs given in the quotation in further detail so that
- $19 \hspace{1cm} \hbox{Rydon could see more detail of exactly what the costs} \\$
- given in the quotation consisted of."
- 21 Can I ask you to turn back to Harley's quotation, or
- 22 turn to it. It's at  $\{RYD00002606\}$ . This is an email
- from you to Katie Bachellier of 29 January, copied to
- 24 Simon Lawrence, so same day, and you attach the
- 25 quotation to that for Grenfell.

- $1 \hspace{1.5cm} \text{Was this quotation in the same form as that \ which} \\$
- $2 \hspace{1cm} \hbox{you provided to the other main contractors bidding for} \\$
- 3 this project at that time?
- 4 A. Yes, exactly the same document.
- 5 Q. I see.
- 6 Do you know what process you had gone through to
- 7 reach the final figures in the tender?
- 8 A. In what way, sorry?
- 9 Q. Well, what process had you gone through in order to 10 reach the final figures in the quotation document?
- 11 A. I would have measured all the elements on the project,
- obtained prices or used historic prices, compiled the
- tender sum, and compiled the document as well, and
- checked it with Ray and Mark Harris before it actually
- went out.
- 16 Q. Right.
- $17 \hspace{1cm} \text{Let's look at the quotation itself.} \hspace{0.2cm} \text{It's at} \\ 18 \hspace{1cm} \text{\{RYD00002607\}}. \hspace{0.2cm} \text{There it is, we saw it earlier, and we}$
- 19 will come back to it in a bit more detail now.
- 20 If we go to page 2 {RYD00002607/2}, this is a letter signed by you to Rydon, same day, 29 January 2014, and
- $22\,$  it says there in the second paragraph, you see:
- "Our offer includes for the design, supply and fixof a complete envelope package, all in accordance with
- the Clients Requirement Documents issued by yourselves."

- 1 Now, we know that part of Harley's tender, as we can
- 2 see, was for the design of the façade; yes?
- 3 A. That's right, yes.
- 4 Q. If we go to page 9 in this document -- I think we've
- 5 already seen part of this, because I showed you this
- 6 earlier this morning, in the middle -- we can see that
- 7 the total figure for the project, or so far as Harley
- 8 was concerned as potential subcontractor, was
- 9 £3.2 million-odd; yes?
- 10 A. That's right, yes.
- 11 Q. And that was on the basis of zinc rainscreen cladding;
- 12 yes?
- 13 A. That's right, yes.
- 14 Q. Yes, and that was before any alternatives by way of
- product or any value engineering was applied, wasn't it?
- 16 A. That's right, yes.
- 17 Q. Looking at the rates there, do you know where they came
- 18 from?
- 19 A. All the rates? They would have come from prices
- 20 obtained from material suppliers and built up internally
- 21 at Harley.
- 22 Q. I see. Do you know where the measurements had come
- 23 from?
- 24 A. From myself.
- 25 Q. I see. So you had done the measurements based on what,

59

- 1 the drawings?
- 2 A. Based on the drawings, yes.
- 3 Q. I see. If we look at page 10 {RYD0002607/10}, the next
- 4 page, "Alternatives and options", at the top of the page
- 5 there, you can see that halfway down that page there is
- 6 "Rainscreen Cladding" as a section, and we can see that
- 7 there are various prices set out for "As quotation" and
- 8 then "Alternatives ".
- 9 Were the products that you set out there derived
- $10 \hspace{1cm} \text{from the NBS specification} \text{ , do you think?} \\$
- 11 A. Yes, the Proteus and the CGL cladding was, and obviously
- 12 the Reynobond and Alucobond as well as the alternatives .
- $13\,$   $\,$  Q. We can see that you provided prices for both Reynobond
- 14 and Alucobond rainscreen cladding.
- 15 A. That's right, yeah.
- 16 Q. With different prices for face-fixed and cassette,
- although they're identical: £240 per square metre for
- cassette and £190 per square metre for face-fixed.
- Where did you take those prices from?
- 20 A. From memory, probably the Reynobond would have been from21 Geof Blades' costs.
- 22 Q. Right.
- 23 A. And Alucobond, because Alucobond and Reynobond are very

- similar in cost, we would have put the same cost in
- there at that stage, because there was no finishes

Т		specified at that point, so we just put the same cost	Т	511	R MARTIN MOORE-BICK: If you would like to go with the
2		in.	2		usher, she will look after you.
3	Q.	I see.	3		(Pause)
4	A.	Just as a guide.	4		Right, 11.40, then, thank you.
5	Q.	So you didn't actually ask Alucobond to provide	5	(1	1.26 am)
6		a specific number?	6		(A short break)
7	A.	-	7	(1	1.40 am)
8	Q.	I see. So the Alucobond prices there were	8	SII	R MARTIN MOORE-BICK: All right. Ready to carry on?
9	`	an assumption, were they?	9		HE WITNESS: Thank you, yes.
10	A.	That's it, based on historic costs at Harley.	10		R MARTIN MOORE-BICK: Very good, thank you.
11	Q.	Right.	11	011	Yes, Mr Millett.
12	٧.	Do you know or did you know at the time who was	12	М	R MILLETT: Mr Albiston, can I ask you to turn to your
13		going to fabricate the Alucobond cassettes?	13		statement, please, at paragraph 35 {HAR00010151/8}.
14	A.		14		Before I do that, before that comes up on the
15	Q.		15		screen, I have been asked to just revisit something
16	Q.	in these options, although it was listed, as we've seen,	16		I put to you earlier, which was the 18 October budget
17		as one of the alternatives in the NBS specification. Do	17		and the authorship of that document.
18			18		-
19	٨	you know why that is? I don't recall, I'm afraid.	19		That's right, yes.
				Q.	
20	Q.	Do you recall any discussion with Mr Harris or	20		Now, I just want to put accurately to you what
21		Mr Bailey, Ray Bailey, about excluding the VMZinc as	21		Mr Harris said about that on {Day34/65:23}, and his
22		an alternative cost or price for the rainscreen?	22		evidence to the Inquiry was that:
23	Α.	I'm afraid I can't remember any discussion on that.	23		"Answer: It was more likely to have been the
24	Q.	Do you remember whether it was Harley's aim to make sure	24		estimator, I believe.
25		that Reynobond ACM was chosen out of all the options	25		"Question: What, Mike Albiston?
		61			63
1		provided in the NBS spec?	1		"Answer: Yes, that's correct."
2	A.	No, I don't recall any discussions on that.	2		Then he goes on to say at {Day34/66:5}:
3	Q.	Right.	3		"Answer: It's more likely to have been him, so
4		I mean, we've seen from your evidence this morning	4		I couldn't absolutely categorically say it wasn't me,
5		and other evidence that the only fabricator approached	5		but looking at that document, that's more likely to have
6		was CEP, the only quotation from them was for Reynobond	6		been him.
7		ACM, the only figures that are quoted for the	7		"Question: Okay.
8		alternative are based on Reynobond as firm figures, you	8		"Did you have any discussions with Mike Albiston or
9		hadn't approached Alucobond and hadn't got any prices	9		any input into its creation?
10		for Alucobond. In the light of that, would you accept	10		"Answer: I'm sure there were discussions, yeah."
11		that it is fair to say that the use of Reynobond panels	11		Just looking at his evidence, is what he says there
12		was a foregone conclusion?	12		correct, or is your recollection different?
13	A.	No, because at that stage they were just an alternative	13	A.	No, it's different, and I believe probably it's just the
14		to the Proteus zinc, so it wasn't a they were just	14		passage of time, that he probably just doesn't remember
15		there as an alternative system.	15		when I actually started at the company. As I say, it
16	MF	R MILLETT: Mr Chairman, is it a convenient moment for	16		was the beginning of October, so at that point I was
17		a break?	17		working on other projects, I wasn't involved in those
18	SIF	R MARTIN MOORE-BICK: Yes, I think it is, Mr Millett.	18		budgets. So it's really just memory from that time.
19		Thank you very much.	19		But obviously further on, probably a year on, I would
20		Mr Albiston, we're going to have a break now.	20		have been involved in those sort of those documents.
21	тн	E WITNESS: Okay.	21	Ω	I see.
22		R MARTIN MOORE-BICK: We will come back at 11.40, please.	22	٧.	Can we go to your witness statement on page 8
23	311	While you're out of the room, please don't talk to	23		{HAR00010151/8}, paragraph 35, that I've just referred
24		anyone about your evidence or anything related to it.	24		you to. You say here:
25	тп	E WITNESS: Okay.	25		"Any changes to materials had to be agreed by the
ر د	111	L WIIILOU. ORay.	ر ک		Any changes to materials had to be agreed by the

1 architect. Although some changes in materials were 2 proposed or suggested by Harley, these were nevertheless 3 ultimately subject to approval by the architects."

4 Who were the architects that you're referring to

- 5 here?
- 6 A. Studio E.
- 7 Q. Once Rydon was appointed the main contractor, did you
- 8 anticipate a discussion about materials between Harley
- 9 and Studio E in the event of any change which would lead
- 10 to the ultimate approval by Studio E?
- 11 A. I believe they would have been discussed at that point,
- 12
- 13 Q. How did you come to that understanding?
- 14 A. Because it's usual on these sort of projects where there
- 15 are changes that it has to go through the architect.
- 16 Q. You say usual on these sorts of projects; did you have
- 17 any specific conversation with anybody within Harley 18 about what you should do where there was to be a change?
- 19 A. Sorry, in what way?
- 20 Q. Well, did anybody tell you -- anybody at Harley, that
- 21 is -- that where there was to be a change in materials,
- 22 you should have or there should be a discussion with
- 23 Studio E or with Rydon?
- 24 A. No, it was just industry practice, really, that any
- 25 changes would be agreed by the architects.

65

- 1 Q. Did you in fact in the end ever have a discussion with 2.
- Studio E whereby they approved a change in material? 3 A. No, because after the contract was won by Rydons and
- 4 they appointed Harley, I didn't actually have any
- 5 discussions with Studio E or Rydons on product changes.
- 6 O. I see.
- 7 Do you know whether anybody else at Harley had 8 discussions with Studio E whereby they approved a change
- 9 in materials?
- 10 A. I don't know if they did or not.
- 11 O. I see.
- 12 Can we look at {RYD00003315}, please. This is
- 13 an email from Mark Harris to Steve Blake of
- 14 14 March 2014, which attached proposed value engineering
- 15 options, and you can see that it was copied to you as
- 16 well as to Simon Lawrence and Katie Bachellier.
- 17 Let's look at it. It says:
- 18 "Please find the first round of V/E options attached
- 19 for Grenfell Tower.
- 20 "This has been presented to show the value of the
- 21 compliant package, with V/E cost options below. The
- 22 cladding is shown with 4 options for the main zinc
- 23 areas. At the risk of stating the obvious, the cladding
- 24 savings are not cumulative, only one of the four options 25

66

can be selected."

1 Looking at the date, Mr Albiston, this was after

- 2 Harley's quotation had been submitted, wasn't it?
- 3 That's right, yes.
- 4 Some time after, actually, about six weeks or so.
- 5 Α. Yes.
- 6 Q. Yes.
- 7 Were you involved in producing the value engineering
- 8 options that Mr Harris was referring to?
- 9 A. I was, yes.
- 10 Do you know who asked you to do that?
- 11 Within Harley or externally? A.
- 12 Well, let's start with Harley.
- 13 It would have been Mark Harris.
- 14 Q. Right. Did anybody externally ask you to do it?
- 15 A. Not directly, it would have been through Mark. It would 16 have been Rydons who would have asked that.
- 17 Q. I follow.
- 18 Now, we'll go to the attachment in just a moment.
- 19 Before we do, sticking with the email, in the fourth
- 20 paragraph down, Mark Harris says:
- 21 "We have included options for both face fixed (as
- 22 used at Camden) and secret fixed (cassette), but again
- 23 would comment that the architect was none too keen on
- 24 face fixed when discussed. I would be surprised if they
  - would accept Reynobond with a standard paint finish,

67

- 1 however, we have included it as one of the options on
- 2 the basis that a significant cost saving can be made.
- 3 Although the attached states standard silver finish, any
- 4 of the standard ACM colours would be available at the
- 5 same rate.
- 6 "Hope this is sufficient for your meeting on
- 7 Monday?"

- 8 Did you yourself explore any value engineering
- 9 options in respect of a zinc product, Mr Albiston?
- 10 A. I don't believe I did, no.
- 11 O. Why is that?
- 12 I wasn't asked to.
- 13 Q. Right. Did it occur to you to take that up with
- 14 Mark Harris and say, "Well, we should be looking at
- 15 alternative costings for zinc"?
- 16 A. No, because that wasn't -- wasn't my position to
- 17 actually make those suggestions.
- 18 Q. Right.
- 19 Did you yourself think about going back to KME and
- 20 asking for a price reduction?
- 21 A. No, I didn't.
- 22 Q. I take it from that answer that there was no discussion
- 23 between you and Mark Harris or anybody else at Harley
- 24 about going back to KME and asking for --
- 25 A. Again, I can't recall it. Again, we may have actually 68

- $1 \hspace{1cm} \text{contacted KME about a price reduction, but I can't} \\$
- 2 recall a conversation.
- 3 Q. At the time that ACM was raised as an alternative option
- 4 to zinc, what assessment had you or, to your knowledge,
- 5 anybody else at Harley done to determine that ACM
- 6 complied with ADB, Approved Document B, as the choice of
- 7 material to provide the surface of the external wall on
- 8 the building?
- 9 A. Sorry, could you repeat the question? Sorry.
- $10\,$  Q. Yes. When ACM was raised as alternative to zinc, did
- you do any assessment or did anybody at Harley do any assessment for compliance with Approved Document B?
- 13 A. Right, I didn't do any assessments. It's possible that
- someone else in a technical position would have done
- 15 that.
- 16 Q. Right.
- 17 Can we then look at the attached document, which is
- 18 at {RYD00003316}, please.
- Do you know who created this document?
- 20 A. That was myself.
- 21 Q. That was you.
- Now, all the proposed cladding savings which are set
- out here refer only to Reynobond products. There is no
- Alucobond and no VMZinc, for example. Why was that?
- 25 A. Again, I would have been told to do that by either

- $1 \qquad \quad \text{Ray Bailey or Mark Harris.} \quad \text{That was the product we were} \\$
- 2 just using on those alternatives.
- 3 Q. When you say "told to do that", do you mean told only to
- 4 look for reductions on Reynobond products?
- 5 A. I think because at that point there was discussions with
- 6 Reynobond over the particular finishes, like the zinc
- 7 type of finish, so that was the route we was going down
- 8 at that point.
- $9\,$   $\,$  Q. Right. Does that explain why you didn't go back to
- 10 Alucobond to say, "Can we actually have a good price",
- $11 \hspace{1cm} \text{or a price that was better than what Reynobond were} \\$
- 12 offering you at the time?
- 13 A. That's right, yes.
- $14\,$   $\,$  Q.  $\,$  Do you remember where you got these revised prices from?
- $15\,$  A. Probably -- it would have been -- with Reynobond, it
- would have been from CEP.
- 17 Q. You say probably; do you remember that?
- 18 A. Not exactly, but that would have been the basis of those costs.
- 20 Q. I see. So these costs would have included fabrication?
- 21 A. That's right, yes.
- 22 Q. Yes.
- Now, if you go to your statement, please, you see
- that you say there at paragraph  $31 \{HAR00010151/8\}$ :
- 25 "I have been an estimator for over twenty years ..."

- We saw this earlier and we also saw this reference to Booth Muirie.
- 3 Is it fair to say that you were familiar with
- 4 Alucobond and had used it successfully with other
- 5 companies on other buildings?
- 6 A. Yes, I had, yes.
- 7 Q. Did you raise any concerns with Mark Harris about not
- 8 using Alucobond or not seeking quotations for Alucobond
- 9 as an alternative?
- 10 A. No.
- 11 Q. Why is that?
- 12 A. I didn't think it was an issue.
- 13 Q. Did you have a feel for whether, when looking at value
- engineering, Alucobond might provide even more
- favourable reductions than Reynobond?
- 16 A. It's possible, but from experience, Alucobond and
- $17 \hspace{1cm} \textbf{Reynobond were very similar cost, so there was not much} \\$
- to choose between them, really.
- 19 Q. Now, you said a moment ago that you might have got these
- 20 revised prices from CEP. Do you remember having
- a discussion with Mr Blades or anybody else at CEP about
- 22 these revised prices?
- 23 A. No, because the -- I think the value engineering options
- $24\,$  were based on actual measures of all the cladding areas,
- so it would have been based on his original quotation

71

- 1 that he provided.
- 2 Q. Right.

4

5

6

- $\label{eq:control} 3 \qquad \qquad \text{Do you know what accounts for the reduction in each}$ 
  - case? If it helps, we can look back at the document.
  - Perhaps we should do that.
    - If you look at {RYD00003316}, we'll just focus on,
- 7 for example, the £576,000-odd reduction in relation to
- 8 Reynobond aluminium face-fixed. Do you know how it was
- 9 that that figure was arrived at?
- $10\,$   $\,$  A. Yes, it would have been comparing the cost for the
- $11 \qquad \quad \text{Proteus zinc cladding against the Reynobond and the} \\$
- difference in those.
- 13 Q. Yes, and given that this is value engineering, can you
- account for the increase in saving or difference between
- 15 the two
- 16 A. Sorry, the saving between which, sorry?
- 17 Q. Between the zinc, the Proteus zinc, as you said a moment
- ago, which was the comparator, and the --
- 19 A. Right. Well, the Proteus was a more expensive product
- $20\,$  than the Reynobond, so that's the difference in cost.
- Q. Yes, I'm sorry, maybe we're at cross-purposes. I'm asking you how these precise figures were arrived at
- asking you how these precise figures were arrived at.
- 23 Do you know?
- 24 A. As I said before, it was based on a cost for the Proteus
- as we used in the compliant bid, and then re-worked

70

2

3

In the third paragraph, he says:

"I would prefer to try and stick with Reynobond if

poss, nothing wrong with Alucobond of course, but I'm

4 4 a difference in cost. not sure we can manage the cost so well if we go that 5 Q. Were these prices that you were offering not reductions 5 6 6 on the prices that were contained in the Harley quote of Do you know why Mr Harris wanted to stick with 7 7 Revnobond? 8 8 A. No, because the compliant bid of the 3 million is as the A. No, I don't. 9 9 quotation. Q. Can you comment on his professed reason there, which is 10 10 Yes. managing the cost? Q. 11 11 No, I don't --A. The savings are sort of more accurate figures, because A. 12 in the quotation it was just square metre rates, which 12 Did you share his concerns that you saw in this email 13 13 didn't really mean a lot in the scheme of the job, so regarding Harley's ability to manage the costs if the 14 14 these are more based on actual areas. So these figures clients selected the Alucobond product? 15 15 weren't actually given before as VE options. A. I can't recall any sort of -- anything on that. 16 Q. I see. Right. Well, let's just look at that. 16 Obviously I saw the email as it was copied to me, but 17 We can't find any trace of any document in which you 17 I don't recall anything crossing my mind when I saw 18 went back to CEP and asked them about revised prices 18 19 19 before quoting these to Rydon. Is that because you Q. Can we turn to {CEP00051297}. This is an email from 20 20 didn't need to go back to CEP? Mark Harris to Geof Blades just two days later, 21 21 A. That's right, yeah. 24 April 2014, copied to you and Ray Bailey: 22 22 Q. They were simple comparators --"Morning Geof 23 23 A. That's right, yes. "Just to place a note on record regarding the 24 24 -- between what had previously been quoted and the zinc? conversations between Debbie French and myself with 25 25 A. Yes. respect to Grenfell Tower." 73 1 1 Q. Yes, I follow. Then he goes on to say: 2 2 Can we go to {RYD00004916}, please. This is "The rates from Alcoa specific to the Grenfell 3 3 an email from Simon Lawrence of 22 May 2014 to project for Brushed Look and Effects colours as stated 4 4 Claire Williams at the TMO, and he says in the first below (the colours shown as offering maximum saving 5 5 against the original natural zinc) will all be supplied paragraph: 6 6 "Goods news hot of the press, is that what we at the same rate as Alcoa's 'standard' colour range. As 7 7 believed to be a more expensive ACM cladding finish stated, this is a special for Grenfell Tower." 8 8 (Natural Aluminium) isn't going to be. The Is it fair to say that the value engineering 9 9 manufacturers have confirmed that they are willing to exercise that you were involved in, as we've seen from 10 supply it at the same price as the other ranges 10 the VE options spreadsheet of 14 March, focused on 11 previously discussed. Therefore the savings stay the 11 obtaining an appropriate Reynobond product from 12 same as per attached. £293,368 (cassette) or £376,175 12 Deborah French at Alcoa? 13 13 (face fixed)." A. That's right, yes. 14 Were you aware that Rydon had not passed on to the 14 O. To the best of your recollection, did Harley and you 15 15 TMO, their client, the full savings from using ACM that particularly only consider the Reynobond product for 16 16 you were offering? value engineering options? 17 A. No, I wasn't aware. 17 A. I think at that point, because of discussions with Reynobond regarding finishes, it was very much going 18 Q. Can we look at {HAR00000931}, please. This is an email 18 19 copied to you, 22 April 2014, from Mark Harris to 19 down the Reynobond route at that point, so I think it 20 Simon Lawrence: 20 was sort of focused on that, because if you start going 21 "Simon 21 down the Alucobond route, there's other finishes and it

22

23

24

25

"By far the easiest way for us to respond, is for me

to forward a copy of Bruce's email to Deb French at

74

I'll do that straight away."

Alcoa (the Reynobond lady) for comment regarding cost.

22

23

24

25

1

2

3

using the Reynobond prices, and that would have been the

saving. Because Reynobond was a more -- you know,

a less expensive product than Proteus, there was

just puts a whole load more different, you know,

So when you say "very much going down the Reynobond

route", does that really tell us that, by this stage,

76

finishes into the mix, really.

1 although perhaps no formal decision had been made, so 2 far as Harley was concerned, it was going to be 3 Reynobond? 4 A. It probably was, yes. 5 Q. Yes. 6 Could I ask you to look at {HAR00005692}. This is 7 an email two days earlier, actually, of 22 April 2014 8 from Mark Harris to Deborah French, and he makes the 9 same point in the third paragraph. He says: 10 "I need some guidance regarding prices. 11 "We are trying to stick with what I would call 12 standard Reynobond rates, and I believe we spoke about 13 certain colours ..." 14 Then if you look at the bottom of that, he says: 15 "If you could respond in terms of which fall within 16 the standard price range, and which fall outside (rather 17 than quoting actual cost figures), I can then forward it 18 straight on to all concerned." 19 Again, you were copied in on this email. 20 Did you understand that, had the email contained the 21 actual prices, Mr Harris would not have wanted to 22 forward that straight on? 23 A. That's right, yes. 24 Q. And that's because Harley wouldn't want the architect to

A. That's right. That's usual anyway.

know the actual prices?

2 Q. Right. Is that because the cost saving or uplift

3 inherent in your prices was something that you didn't

4 want the architect to know?

5 A. It's really just obviously the build-up of cost.

Because the architect can't just buy the product from

7 a supplier, he has to obviously come through

8 a fabricator and an installer, but obviously we've got

9 our add-on costs on that as well.

10 Q. Yes.

25

6

11 Now, can I ask you about the KME Proteus product.

12 If we can go to {RYD00004085}, please, this is an email

13 from you to Simon Lawrence of 30 April 2014. Do you see

14 that?

19

15 A. Yes, I do, yes.

16 Q. It's from you to Simon Lawrence, 30 April 2014, and you

17 attach the Proteus HR brochure, among other documents, 18

the NedZink as well, and you say:

"Hi Simon

20 "Please find attached the following information from

21 KME for the Proteus Rainscreen cladding."

22 You attach a typical draft guarantee, the new sales

23 brochure and a CWCT test document, which in fact I think

2.4 was on weathertightness, wasn't it?

25 A. It probably was, yes. Q. We can see from your description of it.

2 A. Right.

3 Q. We can look at the document if you like, but it's about

4 wind speed and serviceability and fatigue assessments,

5 which demonstrates a 50-year lifespan.

6 Do you know what had prompted you to send this

7 information and material to Mr Lawrence?

8 A. It would have been a request from Rydons, particularly 9

Simon Lawrence.

Q. I see. 10

11 Was the Proteus product, the zinc HR Proteus

12 product, still being considered at this stage,

13 30 April 2014?

14 A. I believe it must have been, yes, because it would have

15 been -- as you see in the documents, it would have been.

16 Q. When you saw this email, were you surprised that the

17 Proteus HR rainscreen panel product was still

18 a candidate after all the value engineering you had done

on Reynobond ACM?

20 A. No, because that was still the architect's preferred

21 cladding system at that point. It was still the one in

22 the NBS.

19

23 Q. I would like to look next at the costing error that

24 there was in the ACM and its impact on the choice of

25 face-fixed or cassette, if any.

1 It's right, I think, that you made a cost error in 2 Harley's quotation for Grenfell Tower, didn't you?

3 A. That's right, yes.

4 Q. Let's look at {RYD00009596}, please. This is an email

5 chain between you and Zak Maynard at Rydon. At the very 6 bottom of page 1, we can see your email to Zak Maynard

7 of 23 June 2014, and you say:

8

9 "I've been through my cost error on Grenfell Tower 10 and enclose the following to explain what happened."

11 Then there are some details set out there which

12 I don't need to go to quite yet.

13 You say "my cost error"; is it fair to say that it 14 was you who made the mistake when initially costing the

15 project?

16 A. That's right, yes.

17 Q. Okay. Then you go on to explain, if we look at the

18 bottom of page 1 and over to page 2 {RYD00009596/2}, how

19 the cost saving error came about. If you look at

20 page 2, I think, most of the detail is there.

21 I don't want to spend time reading it all out to 22 you, but in essence, your original cost had omitted

23 items for face-fix, including flashings, smoke stops and

24 supports for the crown, whereas the zinc cost did

25 include those. That's right, isn't it?

A. That's right, yes. 1 had omitted the additional supports at the head of 2 2 Q. And the same in relation to the cassette, but the columns, flashings and copings, and vertical and 3 3 difference was a bit less. horizontal smoke stops. 4 A. That's right, yes. 4 For someone with your experience in pricing  $% \left( 1\right) =\left( 1\right) \left( 1\right)$  and 5 Q. Is it right, then, that in summary, because of your 5 estimating, would you agree that this was quite a basic 6 6 error, the saving that Harley were able to offer Rydon error? 7 7 for face-fixed Reynobond PE panels was only £376,000-odd A. Yes, I would, and at the time I was horrified by it. 8 8 as opposed to £576,000-odd? Q. Can you explain how you came to make it? 9 9 A. Yeah, that's -- if that's the figures, yeah, I can't --A. I can't, because if I knew how I made it, I wouldn't 10 Q. Yes, and in respect of cassette-fixed panels, the new 10 have made it in the first place. But unfortunately it 11 reduced savings would be 259,000 instead of 419,000. 11 was just a case of omitting too many items and not 12 A. Yes 12 adding back the items that needed to be added back in. 13 13 Q. Let's go on a bit in time, {RYD00009823}, please. This Q. Right. You can't explain how you came to make that 14 is an email of 25 June 2014 from you to Mr Maynard, 14 15 15 copied to Mark Harris, "Grenfell Tower - price build A. Well, as I said, I added back items that shouldn't have 16 16 up", and you attach the cost saving error breakdown. been added back in or vice versa. 17 You say in the second paragraph: 17 Q. Can we look at {HAR00005775}, please. This is an email 18 "As you see, the shortfall of both face fix and 18 from Mark Harris to Ray Bailey, copied to you, 19 19 cassette is £200,380. But as explained in my previous 23 May 2014. If we scroll down to the second email 20 20 email, the cost used for cassette was more accurate than down, you can see there is an email from Bruce Sounes of 21 the face fix which was a bit low. This would result an 21 23 May also, the same day, earlier in the day, 2014, to 22 22 Claire Williams and Simon Lawrence, copied to additional shortfall to Harley of around £37,850 if face 23 23 fix was selected." Mark Harris. So we can see Mark Harris essentially 24 24 Is it fair to say that the cost error was minimised copying that on to you and then making a comment. 25 25 by about £40,000 if the cassette fixing was chosen? So scrolling down, we can see what Mr Sounes says, 1 1 A. I believe that's the case, yes. and he says, under the blue heading "Picasa web album", O. So about £160,000 instead of about £200,000? 2 2 which is actually a reference, he says: 3 3 A. Yes. "The brushed aluminium (Natural Aluminium Brushed 4 4 H 9103 S) looks very good. The appeal relies also on So would it follow from that that, as far as you were 0. 5 concerned, from Harley's financial perspective, 5 the deep shadow joints, and I think the vertical joints 6 6 a cassette fix was the better option? channel rainwater run-off thereby keeping the faces 7 7 A. It would have been, yes. cleaner. The natural aluminium seems to have [picked] 8 8 Q. Yes. up less dirt than the painted panels. It is very 9 Can we look, then, at the attachment to this email. 9 reflective but I don't think it will get glare 10 the cost saving error breakdown. It's at {HAR00014785}. 10 complaints." 11 11 Here it is, 25 June 2014. Then he goes on to say: 12 Did you create this document? 12

"If we send the Planners to see the example they will jump on the fact  $% \left( 1\right) =\left( 1\right) \left( 1\right) =\left( 1\right) \left( 1\right)$  the fact it is clean of all face fixings , with rivets mostly concealed in return faces to the joints. I know you have prepared cost options to do this but I've prepared a sketch, attached showing how the ACM could be assembled as cassettes or perhaps as a hybrid which I'm less convinced by.

"I think the brushed aluminium cassette will be accepted by Planners."

Now, scrolling up, we can see that Mr Harris sends this to Claire Williams and Simon Lawrence but copies in Mark Harris and you. Do you see that?

24 I do, ves.

13

14

15

16

17

18

19

20

21

22

23

25 Q. Mark Harris sends it to Ray Bailey and you get this.

82

Q. We can see in the first box at the top of the page that

Q. And compared with zinc. So you can see the saving for

ACM, there is the 576 figure, and in the second box

Q. So we're comparing the saving given with the actual; is

Q. I've got that right. So we can see from that that you

originally calculated and given to Rydon.

I think you set out the actual savings.

you set out the original savings for ACM face-fixed as

84

that right?

A. That's right, yes.

13

14

15

16

17

18

19

20

21

22

23

24

25

A. Yes, I did.

1 The comment is: 2 "Interesting comments from the architect. This 3 might help with our current predicament! I've not 4 spoken with Simon about cost issues as yet, and I think 5 I will keep quiet and see how this plays itself out." 6 By "our current predicament", did you understand 7 when you saw this email, as you did, that Mr Harris was 8 referring to your cost estimating error? 9 A. That's right, yes. 10 Q. Is it fair to say that the cost error therefore came to 11 light within Harley in around May 2014? 12 A. That's right, yes. 13 Q. Do you remember how or when you first discovered it? A. I can't remember actually when, but it was myself who 15 discovered it. I was just looking at costs again just 16 for my own purposes and I discovered the error. 17 Q. Right. 18 Were you hoping, or was Harley hoping, that the 19 error would be minimised by a cassette choice without 20 having to discuss it with Rydon? 21 A. It possibly was the opinion of Harley, but again, 22 I wasn't really involved in discussions on that. 23 Q. Again, that's because, for Harley, the optimum cost 24 savings would be from choosing cassette and not 25 face-fixed, as I think ---1 A. That's right, yes. 2 Q. Is that why Mark Harris wanted to see how it played out, 3 to your understanding? 4 A. I think it was, yes, yes. 5 Q. Can we go to {HAR00000944}, please. This is an email of 6 25 April from Mark Harris to you under which he forwards 7 to you an email the same day, a little earlier that day, 8 from Simon Lawrence to him, Mark Harris, and 9 Kai Fabiunke at Studio E, copied to Bruce Sounes, 10 "Afternoon Kai", that should say, and he says in the 11 second main paragraph: 12 "in order to design a system that achieves the 13 Client's requested budget ..." 14 Do you see that? 15

"... we need to be making everything face fix and from

Just on that, is it right that by this stage,

therefore, 25 April 2014, you knew that Rydon wanted

remember reading that, that email, but that would have

error, as you did in about May, as I think you told us,

Q. Right. Okay. But once you had discovered your costing

flat sheet where possible."

been the case.

face-fixed for the client's budget?

1 there was then -- is this right? -- a desire within 2 Harley to have cassette in its own financial interests? 3 A. Possibly, yes. 4 O. Yes. 5 Now, if we look at {RYD00005425}, this is an email 6 from Mark Harris to Simon Lawrence, 30 May 2014, copied 7 to you as well as Ray Bailey and Daniel Anketell-Jones, 8 and the subject is "Grenfell - Rivet matched to natural 9 brushed ali Reynobond", and in the second paragraph, he "That said, as discussed on site, our preference would be for cassette for lots of reasons!!" Do you know what the lots of reasons were that he was referring to? It possibly would have been because of the cost A. difference. 17 Q. Yes. Were there any others? 18 A. Not that I'm aware of. Do you remember whether any consideration was given, either by you or anybody else in Harley that you knew of, as to how the different fixings might impact or affect fire safety or fire performance? 23 A. Q. Were you aware, at this time or indeed at any other time when working on this project, that Reynobond PE 55 in 1 a cassette format was significantly more combustible 2 compared with a riveted format? 3 A. No, I didn't know. 4 Q. Do you know whether anyone at Harley had ever had 5 a discussion about the relative fire performance of each 6 of these --7 A. I don't know. 8 Q. -- different fixing systems? 9 A. I don't know. 10 Q. Did you yourself make any investigations into how the fixing method would affect fire performance? 12 No, because I didn't have any concerns about it. Can we then turn to the subject of insulation and go back briefly to the NBS specification. This is the final version of January 2014 that I want to look at, so not the version we were looking at before, but it doesn't make any difference for this purpose. {SEA00000169/73}, please. This is page 73, clause 776, and we can see here, under "Thermal insulation", that what's specified was: "Material: ... rigid [PIR] ... "Manufacturer: Celotex ... "Product reference: FR5000 aluminium foil faced both sides." Is it right to say that the installation of the

88

16

17

18

19

20

21

22

23

24

- 1 insulation was part of Harley's scope of works?
- 2 A. That's right, yes.
- 3 Q. And would it follow from that that you were required to
- 4 provide a quotation which included a price for the
- 5 purchase and installation of the insulation product?
- 6 A. That's right, yes.
- 7 O. Now, we don't see any alternatives set out in the
- NBS specification for thermal insulation; that's right,
- 9 isn't it?
- 10 A. That's right, yes.
- 11 Q. I would ask you to accept that.
- $12 \hspace{1.5cm} \hbox{\it Can we then turn to the quotation that you prepared} \\$
- 13 in January 2014 at {RYD00002607}, please. There it is ,
- it's a lengthy document, but if we go to page 9
- 15 {RYD00002607/9} again, which we looked at before, which
- is the cost build-up and the total, we don't see any
- reference in there to the product specified for
- insulation, or indeed anywhere in this document.
- 19 A. No, that's in the descriptions for the rainscreen
- $20\,$   $\,$  cladding in the document. So further back in the
- document the insulation is referred to.
- 22 Q. Yes, and we can see that if we go back a little bit, but
- 23 my question is: there is no reference to any particular
- 24 product.
- 25 A. No, no.

89

- 1~ Q. No. If we look at, indeed, page 8 {RYD0002607/8}, the
- 2 page before, and look under excluded items, we looked at
- 3 that before, or rather we looked at that elsewhere in
- a different document, but here we see, "Items excluded
- from our quotation". We can see that insulation -- it's
- 6 a slight negative here -- isn't included from the items
- 7 excluded, if you see what I mean.
- 8 Does that tell us that it must have been positively
- 9 part of your package?
- 10 A. That's right, yes.
- 11 Q. What was the product that was going to be used as
- 12 contemplated by this quotation?
- $13\,$  A. It was going to be either Celotex or a similar
- 14 insulation product.
- 15 Q. I see. Did you yourself consider whether the Celotex
- specified, the FR5000, was a suitable product for use at
- 17 Grenfell Tower?
- 18 A. No, because that wasn't my role at the company to check
- 19 those things.
- 20 Q. Right. Did you have any conversations with anyone at
- Harley about whether FR5000 was suitable for Grenfell?
- $22\,$   $\,$  A. As I said before, the NBS document would have been
- looked at by Daniel or Ray Bailey.
- Q. I think you told us earlier that you didn't go to
- 25 suppliers and get specific quotations or figures from

- 1 specific manufacturers, particularly Celotex.
- 2 A. No, I didn't.
- 3 Q. Right. Is there a reason why you didn't go to Celotex
- 4 and ask for a price for FR5000?
- 5 A. Because we had historic prices for insulation used on
  - previous projects, it was like an item that you can be
- 7 fairly confident in the cost base for, so you can use
- 8 those on most projects.
- $9\,$   $\,$  Q. Would it not have been sensible, rather than just being
- $10 \hspace{1cm} \hbox{fairly confident in the cost base, just to send them} \\$
- an email and ask them for a price?
- $12\,$  A. It's not usual, really, it's just usual practice,
- you know, if we know prices. Unless you have got
- particular items like the rainscreen cladding or the
- windows, curtain walling, which are the larger items on
- a project, they're obviously more cost based, but
- insulation is very much a square metre rate used on
- a building, so we're fairly confident in those prices.
- 19 Q. Right.
- Given that you had not, or so far as you remember,
- 21 you couldn't remember whether you had worked on
- a project where Celotex was used or not, would it not
- have been sensible to ask Celotex for a specific price
- 24 rather than --
- 25 A. No, because as I said before, Harley had used that

91

- product before, so I was reliant on their cost, the cost
- 2 information I was given.
- 3 Q. Right. You say Harley had used that product before; do
- 4 you know on what projects Harley had used FR5000 before?
- 5 A. I don't know, I'm afraid.
- 6 Q. How had you come to understand that Harley had used
- 7 FR5000 on previous projects?
- 8 A. I can't recall exactly, but again, it would have just
- 9 been through discussions with, you know, Ray or Mark.
- 10 Q. Do you remember specifically, or if not specifically
- $11\,$  generally, actually being told that FR5000 had been used
- by Harley on previous projects?
- 13 A. I can't recall that, I'm afraid.
- $14\,$   $\,$  Q.  $\,$  But you say that's the impression you were given from
- discussions by --
- 16 A. That's right. It wasn't a case of when the NBS document
- we looked at, it was, "This is unusual, this is
- something we haven't used before", so, you know, it was
- just something that we were happy to use.
- $2\,0\,$   $\,$  Q.  $\,$  Do you know whether anyone at Harley ever made any
- 21 specific enquiries about whether FR5000 would be
- suitable to use at Grenfell?
- 23 A. I don't know.
- 24 Q. Now, we know that the RS5000 Celotex product was
- launched on 5 August 2014. Were you aware of that

1 launch of that product --2 A. No. 3 Q. -- at that time? 4 Were you aware that it was then specified for use on 5 the Grenfell Tower project shortly after that launch? 6 A. I wasn't aware of that, no. 7 O. Were you aware that there had been a change of material 8 from the FR5000 as specified in the NBS specification to 9 RS5000 in around August 2014? 10 A. No. 11 Q. Do you know whether that change was the subject of 12 discussion within Harley? A. No. Sorry, what time of the year was that? 13 Q. August 2014. 15 A. August. So I think by that point I was actually not on 16 the project anymore anyway, so ... 17 Q. Right, okay. 18 Well, let's look at a document. Can you go to 19 {CEL00009973}, please. This is a document created by 20 Celotex called a Salesforce entry in a database. 21 Are you familiar with this document or with this 22 kind of document? 23 A. No, I've never seen this before. 24 Q. There is no reason why you should be --25 A. No. 93

2. let's look at page 2 {CEL00009973/2} of it. 3 Now, this is a list of meetings and communications 4 between Celotex's sales force or others at Celotex and 5 those at Harley. If you look at the entry for 6 24 November 2014, just below halfway down, you will see 7 that there are a number of items for that date. The 8 date is on the right-hand column. You can see that the 9 second item down against the date of 24 November is 10 a meeting with you on the subject of Premier House. 11 A. Yes. 12 Do you remember that meeting? 13 A. No. 14 Q. You don't. 15 A. No. 16 Q. Can we go to {CEL00000452}, then, please. These are 17 meeting notes taken by Jonathan Roome of Celotex after 18 a meeting that he had had at Harley's offices on 19 24 November, and if you quickly flip to page 2 20 {CEL00000452/2}, you can see that Mr Roome has put 21 an email signature on that document. 22 Now, if we just go back to page 1 {CEL00000452/1}, 23 please, you can see a heading "Mike" under 24 Chartwell House. It's been cut off at the bottom of the

94

Q. -- given that it's an internal Celotex document, but

2 Q. But if we can just scroll up a little , there, we can 3

4 "Chartwell House - Southend - Tender.

5 "Windows & Cladding Refurb.

6 "DTZ Client/Architect.

7 "Mike."

8 Was that you?

9 A. I believe it was, yes.

10 Q. Right, okay.

11 We can see under "Grenfall (sic) Tower", "M/C

12 Rydens(sic)", misspelt and various other things.

13 Do you remember a meeting with Celotex in relation

14 to Chartwell House on 24 November?

15 A. I don't remember, although looking at that, I think it 's

16 actually not referring to me at Chartwell House, I think

17 it's the one below.

18 Q. Ah, okay.

19 A. I think it's Premier House is the project.

20 Q. Right. You're interpreting this, as I am, but done

21 a better job.

22 A. Yeah.

23 Q. Yes, I understand. Okay, fine, and that would be

24 consistent with the Salesforce entry we looked at

25 earlier, where you were having a meeting or discussion

95

1 with Jonathan Roome at Celotex on the subject of

2 Premier Inn on 24 November 2014.

3 A. That's right, yes.

4 Q. Do you remember what was discussed with Mr Roome at that

5 meeting?

6 A. I don't, I'm afraid, no.

7 Q. If we go to {CEL00000018}, please. This is an email the

8 same date, late at night, 24 November 2014, from

9 Jonathan Roome to others, I think, but certainly to

10 Daniel Anketell-Jones:

11 "Re: Celotex Project Review.

12

13 "I spoke with Mark and the team regarding a few

14 projects."

15 You can see the projects set out there:

16 Grenfell Tower, Premier House, Chartwell House,

17 Southend, and Premier Inn, Terminal 4, Heathrow.

18 "Mike had a new project to review."

19 We can see from the top, certainly under

Grenfell Tower, that RS5000 was discussed in the context 20 21

of that project.

22 Do you remember having any discussion at all on that 23 date with Jonathan Roome at Harley House about RS5000?

24 In relation to Grenfell Tower or other projects?

25 Q. In relation to any project.

screen.

25

A. I can't recall, I'm afraid.

2 Q. Right.

3 Do you remember whether there were any discussions

- 4 in Harley, either at or after this meeting, about
- 5
- 6 A. Not that I was involved in, no.
- 7 O. Right.

8 Do you remember whether you saw a brochure relating

- 9 to RS5000 or any other sales literature?
- 10 A. Not that I can remember, no.
- 11 Q. Do you remember Mr Roome being provided with any
- 12 drawings or other documents in relation to the
- 13 Grenfell Tower project?
- 14 A. Again, I -- as I say, I wasn't involved in the job
- 15 particularly then, so I wouldn't have been involved in
- 16 that discussion.
- 17 Q. All right.

18 Can I ask you to go to paragraph 30 of your

19 statement, please, at page 7 {HAR00010151/7}. We can 20 see under that paragraph you are providing a response to

21 a question at paragraph 4(i), and the question was:

22 "Was specific consideration given to the combination

23 of the exterior components (e.g. cladding, insulation, 24

windows, and methods of fixing) and the fire safety, 25 fire -retardancy and compliance with safety standards of

97

1 the same?"

2

3

4

5

7

8

9

10

11

12

14

15

16

Your answer was:

"I was not involved in this area of work, but I would expect that this would have been looked at by

the architects and the Harley design team, with advice

6 from the product manufacturers."

> You say "Harley design team", and then you go on at paragraph 40 at page 9 {HAR00010151/9} -- I just want to show you that first before I ask you the questions about

it -- and the question there that you're addressing is:

"What was the chain of decision-making,

communication and responsibility about the cladding,

13 insulation, windows and fixings?"

At paragraph 40 you say, four lines down:

"Someone in a technical position at Harley would also have been looking to determine whether any given

17 product was suitable and they would be reliant on the 18

supplier."

19 My question is: which particular person at Harley 20 did you have in mind when you referred to the "design

- 21 team", the "Harley design team"?
- 22 A. It would have been either Ray Bailey or
- 23 Daniel Anketell-Jones.
- 24 Q. I see. What about Kevin Lamb as well?
- 25 A. Yes, probably him as well, because he was designing the

1 job under, I think, Daniel.

2 O. I see.

6

8

3 When you refer to "someone in a technical position",

4 again, same question: who were you referring to?

- 5 As I say, either Ray or Daniel.
  - Q. And anybody else?
- 7 A. Possibly Kevin, but again, not being in that department,
  - it was their -- you know, I'm not aware of what their
- 9 system was for checking products, so you have to speak
- 10 to them, really, I'm afraid.
- 11 Q. At the end of that paragraph, you say:

12 "The supplier would be told what the product in

13 question was going to be used for, and would be sent the

14 relevant NBS specification and drawings dealing with

15 that part of the building. The ultimate decision would

16 rest with the architects in relation to all design

17 matters."

18 Do you remember whether Alcoa, who made Reynobond at

19 the time, were sent the NBS specification?

20 I don't know. As I say, the NBS was sent to CEP, but

21 I don't know whether that was forwarded on to Alcoa.

22 Q. Do you remember whether Celotex was sent the

23 NBS specification for Grenfell?

24 A. I didn't send it myself but it may have been sent later

25 on.

3

4

6

99

1 Q. Can we turn to {HAR00001018}, please. This is an email

2 from you to Jason Bethel at Rydon of 23 July 2014, and

you say there:

"Further to our telephone conversation, please find

5 enclosed the following information.

"Within our works package, there is approximately

7 4,076 m2 of insulation on the project, the value of the

8 insulation (material only) is £50,945."

9 Now, as we can see from that, this email followed

10 a telephone conversation that you had had. Do you

11 remember that telephone conversation?

12 I don't. I am afraid.

13 Q. Do you remember roughly what it was about, or do we just

14 have to go on this email?

15 A. No, I'm afraid I don't remember, sorry.

16 Q. Right.

17 Do you know why Rydon didn't know how much

18 insulation was in their work package that they had sent

19 Harley?

20 A. In terms of cost or the --

21 Q. In terms of measurement, square metres, area.

22 A. I don't believe it was actually put in the quotation

23 document.

24 No. Q.

25 A. The actual metreage.

- Q. No. So do you know why it was that Rydon didn't
- 2 themselves know what the area of insulation was that was
- 3 required for the Grenfell Tower project, as this email
- 4
- 5 A. Possibly because they didn't measure it from the
- 6 drawings, they relied on Harleys to actually do that.
- 7
- 8 Do you know how you came to the value of £50,945 for
- 9 the insulation?
- 10 A. I don't, without seeing the pricing documents. It would
- 11 have been what the cost was for insulation in the
- 12 auotation.
- Q. I work that out as £12.49 per square metre, assuming my 13
- 14 arithmetic is right. Does that ring a bell with you?
- 15 A. No, I'm afraid it doesn't.
- 16 Q. You can't help us as to where you got that figure from?
- 17 A. It's a long time ago, I'm afraid. Without seeing my
- 18 pricing documents -- you know, I've priced so many
- 19 projects since then. I'm trying to recall something
- 20 from six/seven years ago.
- 21 Was Rydon enquiring, do you remember, as to the cost of
- 22 the insulation, or were you simply volunteering that
- 23
- 24 A. I think that was a request, because I've said --
- 25 obviously referred to the conversation, and they've

- 1 requested that, the cost and the square metreage.
- 2 Q. Did it strike you as odd that it was only asking about
- 3 the cost of the insulation at this stage in the project,
- Δ mid-July or late July 2014?
- 5 A. I can't remember what I actually thought at the time,
- 6 but just having seen other documents recently, I believe
- 7 it's to do with possibly changing the insulation over to
- 8 a different product. They wanted to know how much cost
- 9 was in there for that and the area. Again, I'm just
- 10 relying on information I've seen recently.
- 11 Q. Do you know when you first priced up the Celotex FR5000,
- 12 the product originally stipulated in the
- 13 NBS specification?
- A. What, the actual project itself or just a cost base?
- 15 Q. Cost for Grenfell.
- 16 A. It would have been back in December/January.
- 17 Q. I see. So not in this email?
- 18 A. No.
- 19 Q. I see.
- 20 Can we then turn to a different document, which is
- 21 a document generated in January 2015 called the Harley
- 22 spec or Harley specification . This is {RYD00046822},
- 23 please. This is a document which looks as if it was
- 24 generated initially by Kevin Lamb on 15 January 2015, if
- 25 you look at the bottom right-hand corner, and it went

102

- 1 through a number of different revisions through to the
- 2 middle of July 2015, as you can see from the revision
- 3 box at the bottom.
- 4 Were you involved in any way in compiling this
- 5 document?
- 6 A. No, not at all.
- 7 O. Did you ever see this document during your involvement 8
- on the Grenfell Tower project?
- 9 A. I might have seen it in passing, but by 2015, I was not
- 10 involved in the project.
- 11 Q. Right.
- 12 Were you involved in pricing the items at P1 and P2
- 13 on the left -hand side there, the glazing P1 panels and
- 14 the glazing P2 panels?
- 15 A. Sorry, I can't see the --
- 16 Q. You can't, I'm so sorry.
- 17 A. That's all right.
- 18 Can you be shown the left -hand side. You will see
- 19 glazing P1 --
- 20 A. Right, okay.
- 21 Q. -- where the P1 panels have a core of styrofoam, and the
- 22 glazing P2, which have a core of 25-millimetre Kingspan
- 23 TP10 rigid insulation. Do you remember quoting for
- 24 those?
- 25 A. Yes, they would have been in the original quotation.

103

- 1 Q. Yes.
- 2 Are you able to shed any light on any changes to
- 3 those specifications later, or were you just not
- 4 involved in the project by this stage --
- 5 That's right, no any change --
- 6 O. -- and later.
- 7 A. Yeah.
- 8 Q. Now, we can see earlier that you were present at
- 9 a meeting on 24 November when RS5000 was discussed, it
- 10

11

- Do you know why RS5000 -- or FR5000, either of
- 12 those, but I think by this stage RS5000 -- was omitted
- 13 from this specification?
- 14 A. No, I don't know.
- 15 Q. Would it be usual to omit the insulation specification
- 16 when designing a façade system?
- 17 A. It's possible it may change once the project had been
- 18 won and it actually reached design stage, things do
- 19 change, but it all goes through to approval from the
- 20 architect, any changes.
- 21 Q. I see.
- 22 Does this tell us, though, that you yourself can't
- 23 shed any light on why either FR5000 or RS5000 were not 24 referred to specifically in this specification?

104

25 That's right, I wasn't involved, so I don't know.

1	MR MILLETT: Very good.	1	A. In terms of what the thermal properties of it or if
2	Well, Mr Albiston, Mr Chairman, I've come to the end	2	there's any fire properties or whatever.
3	of my questions that I've prepared. There may be one or	3	Q. So you would include fire safety performance in that?
4	two others that I may have skipped over in my keenness	4	A. I think it probably would be, yes, if it was particular
5	to get to this point.	5	for that product, yes.
6	SIR MARTIN MOORE-BICK: Yes. If we had ten minutes or so,	6	Q. I see. Does that tell us that, at the time, you didn't
7	that would be enough, would it?	7	see any distinction between different products,
8	MR MILLETT: That should be enough, yes.	8	different insulation products, as regards fire
9	SIR MARTIN MOORE-BICK: Well, Mr Albiston, counsel thinks he	9	performance?
10	has reached the end of the questions but needs	10	A. No, I didn't.
11	an opportunity to take stock and check there aren't	11	MR MILLETT: Right, okay.
12	things he ought to have asked you. So we're going to	12	Thank you very much, Mr Albiston, I have no further
13	take a short break now. We will come back at 12.50,	13	questions for you. I just wish to say thank you to you
14	please, and see if there are any more questions at that	14	for coming to the Inquiry and assisting us with our
15	point. All right?	15	investigations . So thank you very much.
16	THE WITNESS: That's fine, thank you.	16	SIR MARTIN MOORE-BICK: Yes. Well, we are very grateful to
17	SIR MARTIN MOORE-BICK: Again, please don't talk to anyone	17	you, Mr Albiston, for coming along, it's very helpful to
18	about your evidence while you're out of the room.	18	have had your evidence, and now you're free to go.
19	THE WITNESS: Okay, thank you.	19	THE WITNESS: Okay, thank you.
20	SIR MARTIN MOORE-BICK: You go with the usher, please.	20	SIR MARTIN MOORE-BICK: Thank you. If you would like to go
21	Thank you.	21	with the usher, she will look after you.
22	(Pause)	22	(The witness withdrew)
23	Right, 12.50, then. Thank you.	23	SIR MARTIN MOORE-BICK: Well, now, Mr Millett, it would
24	(12.38 pm)	24	probably be convenient to adjourn at this point and
25	(A short break)	25	start our next witness at 2 o'clock.
23	(II bliott break)	23	Start our next withess at 2 5 clock.
	105		107
1	(12.50 pm)	1	MR MILLETT: Very good, Mr Chairman, thank you very much.
2	SIR MARTIN MOORE-BICK: Right, Mr Albiston, we will see.	2	SIR MARTIN MOORE-BICK: 2 o'clock, then, please. Thank you.
3	Mr Millett, do you have some more questions?	3	(12.54 pm)
4	MR MILLETT: I have one, Mr Albiston, and it arises out of	4	(The short adjournment)
5	an answer that you gave me in your evidence very shortly	5	(2.00 pm)
6	before we finished, when I was asking you about Celotex.	6	SIR MARTIN MOORE-BICK: Yes, Ms Grange.
7	This is today, {Day35/90:13} and I'll just show this to	7	MS GRANGE: Good afternoon, Mr Chairman.
8	you.	8	SIR MARTIN MOORE-BICK: Who is the next witness?
9	My question at line 11 was:	9	MS GRANGE: It's Mr Daniel Anketell-Jones.
10	"What was the product that was going to be used as	10	SIR MARTIN MOORE-BICK: Good, thank you.
11	contemplated by this quotation?"	11	MR DANIEL ANKETELL-JONES (affirmed)
12	It was the quotation that we looked at earlier .	12	SIR MARTIN MOORE-BICK: Thank you very much,
13	Your answer was:	13	Mr Anketell-Jones. Sit down, make yourself comfortable.
14	"It was going to be either Celotex or a similar	14	Now, we shall have a break roughly halfway through
15	insulation product."	15	the afternoon, but if at any stage you feel you need to
16	What did you mean or what were you referring to by	16	have an additional break, will you just tell me? All
17	"a similar insulation product", do you think?	17	right. Thank you.
18	A. Well, an insulation product that would actually give	18	Yes, Ms Grange.
19	a similar performance to Celotex.	19	Questions from COUNSEL TO THE INQUIRY
	F		MS GRANGE: Thank you.
20	O. In your mind at the time, what was that?	7. ( )	
20 21	Q. In your mind at the time, what was that?  A. I didn't have an opinion at the time that was at, but	20 21	•
21	A. I didn't have an opinion at the time that was at, but	21	Thank you, Mr Anketell-Jones, thank you very much
21 22	A. I didn't have an opinion at the time that was at, but again, that would have been a technical point brought up	21 22	Thank you, Mr Anketell-Jones, thank you very much for attending today to give evidence. It's very much
21	A. I didn't have an opinion at the time that was at, but	21	Thank you, Mr Anketell-Jones, thank you very much

25

respect?

25

 $I\,\dot{}\,m$  asking you in the course of your evidence, please

1 ask me to repeat the question or put the point in a 2 different way.

3 If you feel you need a break at any point, please 4 let us know.

> Could you please try and keep your voice up so that the transcriber lady there to your right can take down

6 7 a good note of what you are saying. 8 Now, you have made two statements to the Inquiry.

I want to take you to them. They're in a folder on your desk in front of you and they'll appear on the screen.

11 The first is dated 8 November 2018 and it's to be found 12 at {HAR00010149}. If we can look on at page 18

13 {HAR00010149/18} of that statement, is that your

14 signature there at the bottom?

15 A. Yes, it is.

16 Q. Thank you. Have you read that statement recently?

17 A. Yes.

5

9

10

18 Can you confirm that the contents are true? 0.

19 A.

20 Now, the second statement to the Inquiry was made on

21 19 March 2019. If we pull that up, that's at

22 {HAR00010513}, and if you can go to page 2

23 {HAR000105/13/2} of that, again, is that your signature

2.4 at the bottom of that statement?

25 A. Yes.

109

- 1 Q. Have you read that recently?
- 2. A. No.
- 3 Q. Can you confirm the contents are true? That's the short
- Δ statement that you deal with the deletion of certain
- 5 items from your laptop computer.
- 6 A. Yes, it's true.
- 7 Q. Thank you.
- 8 You also made a statement to the Metropolitan Police 9 Service dated 9 December 2019. If we can pull that up,
- 10 it's at {MET00064867}. That's a very short statement,
- 11 just two pages, and that's in the final tab on your
- 12 desk.
- 13 Can you confirm that the contents of that statement
- 14 are true?
- 15 A. Yes.
- 16 Q. Thank you.
- 17 Have you discussed your statements or evidence with
- 18 anybody before coming here today?
- 19 A. No.
- 20 Q. Thank you.
- 21 Now, I wanted to start by considering your
- 22 background and your qualifications.
- 23 If we look at paragraph 4 of your first, main
- 24 statement -- this is at  $\{HAR00010149\}$ , and if we zoom in

110

25 on paragraph 4 -- you tell us there in the first

- 1 sentence that you graduated from the University of
- 2 Sussex in 2003 with a BEng in electrical and mechanical
- 3 engineering, robotics and automated manufacturer. Do
- 4 you see that there?
- 5 Α.
- 6 Q. You go on within that paragraph to explain that, after
- 7 finishing that degree, you initially worked with
- 8 a company called Bespoke Design Services; is that
- 9 correct?
- 10 A. Yes.
- 11 What kind of work did that company do? 0.
- 12 Curtain wall design.
- 13 And cladding design or just curtain wall?
- 14 Curtain wall and windows, from memory.
- 15 Q. Right. How big was that company?
- 16 Initially there was two people, and I think at its
- 17 largest point it was probably five.
- 18 Q. Is it right that the founder of that company and your
- 19 boss at the time was Mr Kevin Lamb; is that correct?
- 20 A. Yes, that's correct.
- 21 Q. Did you know him before you worked at Bespoke Design
- 22 Services?
- 23 A.
- 24 What was your initial role title when you worked for
- 25 that company?

111

- 1 A. I think it was project designer, as it says there.
- 2 Q. Yes. Can you help us as to what that involved in
- 3
- 4 A. So you would take the design by the architect and
- 5 turn -- take the system details and put them together
- 6 into a way that could be then manufactured. So it was
- 7 mainly to do with producing fabrication drawings for the
- 8
- 9 Q. Just to be clear, that was for windows and curtain
- 10 walling; is that correct?
- 11 That's correct.
- 12 So did your role involve designing façades?
- 13 A. No, it was designing fabricated components.
- 14 Q. You say at paragraph 4 of your witness statement that
- 15 you were quickly promoted to the position of project
- 16 designer. Roughly how long before you were promoted,
- 17 can you recall?
- 18 A. No, I can't. I think it's when the company grew in size
- 19
- 20 Q. Yes, and was it Mr Kevin Lamb who promoted you?
- 21
- 22 Q. Did you undertake any formal design training or
- 23 qualifications in order to undertake your role as
- 24 project designer for that company?
- 25 A. I think I want to one of the curtain wall companies for

- 1 a few training courses, Schueco.
- $2\,$   $\,$  Q.  $\,$  Roughly how much time did you spend on those training
- 3 courses, can you remember?
- 4 A. I think it equated to a couple of days.
- 5 Q. What type of projects did you work on? Was there
  - a theme in terms of the type of projects that you ...?
- 7 A. No, it was a sort of design outsourcing company, so it
- 8 was just different façade companies would come to them
- 9 to, you know, draw up their sort of fabrication
- 10 drawings.
- 11 Q. In that role as project designer, were you required to
- 12 consider the fire performance of materials?
- 13 A. No.

- 14 Q. Now, looking again at paragraph 4 of your statement, at
- the end there you say you then moved from Bespoke Design
- Services to Boustead International Heaters Limited. Was
- that in around 2006?
- 18 A. Yeah, I would have thought so.
- 19 Q. And what did your role in that organisation entail?
- 20 A. That was working as a project engineer for -- basically
- 21 they did oil heaters for the oil refinery, so the role
- involved working to sort of put together the fabrication
- components to get them sent out to where they were going
- 24 to be installed.
- 25 Q. So am I right that that was nothing to do with the

113

- design of cladding or curtain walling or any external
- 2 facades?
- 3 A. No, it wasn't.
- 4 Q. You explain in paragraphs 4 and 5 of your statement that
- 5 you had been working there for about six months before
- $\,$  6  $\,$  moving to Harley Curtain Wall in November 2006; is that
- 7 correct?
- 8 A. Yeah, that's correct.
- 9 Q. Now, what role were you initially employed in for
- 10 Harley?
- 11 A. I think it was project engineer.
- $12\,$   $\,$  Q. What were your general duties as project engineer?
- $13\,$   $\,$  A.  $\,$  The same thing as  $\,$  when I was working at Bespoke Design;
- 14 it was taking the architects' drawings and putting them
- into the system, drawings that could then be fabricated.
- 16 Q. Were you designing façades for Harley at any stage?
- 17 A. No, I was designing fabricated components.
- 18 Q. I see, so you're drawing that distinction between being
- 19 the designer of the façade and being the person who is
- 20 designing the fabricated components; is that correct?
- 21 A. Yes, that's correct.
- $22\,$   $\,$  Q.  $\,$  Did you receive any formal training from Harley in
- 23 respect of that role?
- $24\,$  A. Very -- towards the end of my time with Harley I started

114

an MSc in façade engineering with them.

- 1 Q. Yes, I'm going to come to that in a moment.
- 2 So had you obtained any qualifications when you
- 3 initially started working for Harley to assist you in
- 4 your design of fabrication designs?
- 5 A. No, the other thing I did was an MSc in structural
  - engineering, because there was -- the structural
- 7 engineering at that time was subbed out to a structural
- 8 engineering firm and there were issues with
- 9 communicating what you needed from them, so they decided
- 10 having a structural engineer in house would make that
- 11 part easier.
- 12 Q. Yes.

6

- When were you promoted to the role of design manager
- 14 in Harley?
- 15 A. I can't remember. It would probably be on my CV.
- 16 Q. Was it before the Grenfell project or do you think
- 17 during it?
- 18 A. Yeah, it would be before that.
- 19 Q. A long time before or ...?
- 20 A. I can't remember.
- 21 Q. You can't remember.
- So, as you have just mentioned, in paragraph 7 of
- your statement, if we can go to that on page 2
- 24 {HAR00010149/2} of this document, you say that:
- 25 "Whilst working for Harley, I obtained an MSc in

115

- 1 Structural Engineering from the University of Surrey ...
- 2 and started an MSc in Façade Engineering from the
  - University of Bath (2014 to 2017)."
- 4 Is that correct?
- 5 A. That's correct.
- 6 Q. Now, what did your MSc in façade engineering involve?
- 7 A. It involved attending the University of Bath for a week
- 8 at a time, and studying particular topics.
- 9 Q. Did it include looking at the design of façades?
- 10 A. Yes.

3

- 11 Q. Did it include any teaching about the fire performance
- 12 of façades?
- 13 A. Yes, but not until I had left Harley.
- 14 Q. Is it right that the MSc includes one optional module on
- acoustics and fire?
- 16 A. That's correct.
- 17 Q. And did you take that module?
- 18 A. Yeah, I took that after I had left Harley Curtain Wall.
- 19 Q. Was there any other teaching on the course about fire
- 20 performance or the testing and classification of façade
- 21 materials more generally?
- 22 A. Not that I can remember.
- 23 Q. So is it right that, until you did that module of that
- 24 course, you hadn't had any academic training in terms of

116

25 fire performance?

- 1 A. No.
- $2\,$   $\,$  Q.  $\,$  Did the course include anything on the requirements
- 3 under the Building Regulations 2010?
- 4 A. There were different parts of the course that covered
- 5 different parts of the Building Regulations.
- 6 Q. Yes.
- 7 A. So parts of them did. So for example there was
- 8 a thermal course that would have covered part L.
- 9 Q. Yes.
- 10 A. And for the fire course, it would have covered part B.
- 11 Q. I see. So it wasn't until you did the fire module on
- acoustics and fire that you would have looked at part B?
- 13 A. (Witness nods).
- 14 O. Yes.
- 15 SIR MARTIN MOORE-BICK: I'm sorry, Mr Anketell-Jones, it's
- very natural to nod or shake your head, but
- unfortunately it doesn't go on the transcript too well.
- 18 A. Sorry.
- 19 SIR MARTIN MOORE-BICK: So if you could please try and
- remember to say yes or no as well.
- 21 A. Yes, sir.
- 22 SIR MARTIN MOORE-BICK: Thank you.
- 23 MS GRANGE: Yes, so I think you just confirmed that it
- 24 wasn't until you did the fire module on acoustics and
- 25 fire that you would have looked at part B of the

- 1 Building Regulations; is that correct?
- 2 A. Yes, that's correct.
- 3 Q. Mr Ray Bailey last week in his evidence said that you
- 4 were about three-quarters of the way through this MSc in
- 5 façade engineering at the time of your work on the
- 6 Grenfell project. Is that correct?
- $7\,$  A. No, it's incorrect. I didn't start until the end of
- 8 2014.
- $9\,$   $\,$  Q. So if you were to estimate how far through you were that
- $10 \hspace{1cm} \text{course during the time you worked on the Grenfell} \\$
- project, what would you say?
- 12 A. Probably done one module, so probably -- I think the
- $13 \hspace{1cm} \text{last module counts as two, so probably about a } 12 \text{th of} \\$
- 14 the way through.
- 15 Q. Yes.
- Were you aware when you undertook that course that
- the Department of Civil Engineering at Bath University
- works closely with the Centre of Window and Cladding
- Technology, the CWCT, to provide an industry-relevant
- 20 course on façade engineering?
- 21 A. Yes, I was.
- $22\,$   $\,$  Q.  $\,$  When did you first  $\,$  become aware of the CWCT as
- an industry organisation?
- $24\,$   $\,$  A.  $\,$  I think when we started discussing taking the MSc on, so

118

probably earlier that year.

- 1 O. Yes. So does that mean earlier in 2014?
- 2 A. Yeah.
- 3 Q. At the time you worked on the Grenfell project, would
- 4 you have said that you were well placed within Harley to
- 5 advise on whether particular materials complied with the
- 6 Building Regulations?
- 7 A. Only of a structural nature.
- 8 Q. So you were only able to advise on whether the
- 9 structural performance of those materials was adequate
- 10 under the Building Regulations; is that correct?
- 11 A. That's correct.
- 12 Q. And what about the guidance in Approved Document B, how
- familiar were you with that at the time of the Grenfell
- 14 project?
- 15 A. Not very at all.
- 16 Q. Did Harley provide you with any training or ongoing
- 17 continuing professional development to assist you in
- your role as design manager?
- 19 A. The role as design manager was to manage the programme
- of others, so there wasn't much training that could be
- given for that. But for the structural part --
- 22 Q. So is the answer to my question no, that you weren't
- 23 provided with --
- 24 A. No.
- 25 Q. -- ongoing professional development by Harley?

119

1 A. No.

3

6

- $2\,$   $\,$  Q. Now, I just want to look briefly now at an email that
  - we're going to come back to later and look at in much
- $4\,$  more detail, but I won't to go to it now. This is at:
- 5 {CEL00000019/2}.
  - Going down that page, I want to look at the email
- 7 you send on 16 January 2015 at 11.27. Can you just
- 8 quickly familiarise yourself with that email, in terms
- 9 of what you say there. This is an email from you to
- 10 Jonathan Roome at Celotex.
- 11 (Pause)
- 12 A. Yeah.
- $13\,$  Q. So you're saying there in the second line:
- 14 "We are being asked by one of our clients to see the
- test results and certificates for the RS5000
- 16 insulation.
- Then you're asking various questions about the
  BS 8414-2:2005 testing in the next paragraph, and then
- you're also asking about the BS 476-7 testing in the next paragraph.
- Now, as I say, I'm going to come back and ask you a lot more detailed questions later about this, but I just
- lot more detailed questions later about this, but I just want to ask you: do you agree that it's evident from
- this that you are familiar with BS 8414 testing, including the results of that testing?

- 1 A. No, this would have been that I had been asked for
- 2 something specific by one of the clients , and was just
- 3 basically passing it through, requesting the same
- 4 information to send it back.
- $5\,$   $\,$  Q.  $\,$  I see. So is what you are saying that you have received
- 6 a request from a client, and the information you're
- 7 asking for here and the detail you have got in this
- 8 email is just you simply passing that on to Celotex?
- 9 A. Yeah, just passing on their specific request.
- 10 Q. So the same question about the BS 476-7 testing that you
- deal with in the third paragraph there: were you
- 12 familiar with that kind of testing at the time you wrote
- 13 that email?
- 14 A. No, I wasn't.
- 15 Q. Did you know at the time you wrote it what BS 476-7
- 16 testing was relevant to when it comes to the
- 17 classification of materials?
- 18 A. I knew it was relevant to fire testing, that was all.
- 19 Q. That was it, was it? You didn't know anything more
- 20 about it?
- 21 A. No.
- 22 Q. Do you know what classification you might have achieved
- 23 if you had successfully undertaken that test and other
- 24 tests?
- 25 A. Not at that stage, no.

- 1 Q. Were you familiar with a document called BR 135, "Fire
- $2 \qquad \quad \text{performance of external thermal insulation \ for \ walls \ of} \\$
- 3 multistorey buildings", produced by the British Research
- 4 Establishment? Were you familiar with that publication?
- $5\,$   $\,$  A.  $\,$  I  $\,$  had heard it  $\,$  mentioned and people had talked about it
- 6 in support of using certain façades, but it was always
- 7 something I passed through to the clients.
- $8\,$  Q. So had you read that publication at the time of the
- 9 Grenfell project?
- 10 A. No.
- $11\,$  Q. So you hadn't received any formal training, or indeed
- $12\,$   $\,$  informal training , about the testing and classification
- 13 regimes in the UK at this time?
- 14 A. No.
- 15 Q. Did Harley provide you with any formal or informal
- 16 training to keep you up to date with the
- 17 Building Regulations?
- 18 A. No.
- $19\quad \text{Q.}\quad \text{What about something called Approved Document B on}$
- 20 fire safety?
- 21 A. No.
- 22 Q. Had you read Approved Document B at the time of the --
- 23 A. No.
- 24 Q. -- Grenfell project?
- 25 A. My role was as a structural engineer and a design

- 1 manager, so I didn't have any requirement to.
- 2 Q. Were you or Harley at the time of the Grenfell project
- 3 a member of any industry bodies relevant to façade
- 4 design?
- 5 A. No. Harley may have been. I think, yeah, Harley were
- 6 a member of the CWCT.
- 7 Q. Were you aware of that at the time of the Grenfell
- 8 project, that Harley were a member of the CWCT?
- 9 A. I can't remember.
- 10 Q. You can't remember?
- 11 A. No
- 12 Q. What about you personally, were you ever personally
- a member of the CWCT?
- 14 A. No.
- 15 Q. Do you recall attending CWCT members' meetings?
- 16 A. I can remember going to a talk in London or something
- like that, but I can't remember what it was on, or
- whether it was CWCT or not.
- 19 Q. Okay.
- What about any other industry or trade associations
- 21 to do with façades or external walls?
- 22 A. No.
- 23 Q. You don't remember Harley or yourself being a member of
- 24 any?
- 25 A. No.

3

123

- 1 Q. At the time, did you think it was necessary for
- a specialist cladding contractor to engage with trade
  - associations to keep up to date with relevant knowledge
- 4 and industry developments?
- 5 A. It wasn't something that I'd thought of. It was
- 6 something for the senior management to make those
- 7 decisions.
- 8 Q. Yes, and they never suggested that you should keep up
- 9 with those type of industry --
- 10 A. No
- 11 Q. -- bodies or publications?
- 12 A. No, I kept up to date with my structural CPD.
- 13 Q. Yes
- 14 A. But that was where my feeling of responsibility for my
- 15 CPD stopped.
- 16 Q. Was that something you did off your own bat on your
- 17 own --
- 18 A. Yeah.
- 19 Q. -- or was that something you were encouraged to do by
- 20 senior leaders at Harley?
- 21 A. It was something I did on my own out of a feeling of
- needing to progress and keep up with current
- 23 legislation.
- 24 Q. Yes.
- Now, in terms of your role on the Grenfell project,

122

- 1 if we go back to your statement on page 2
- 2 {HAR00010149/2} and we look at paragraph 9. So you say
- 3 there in the first sentence that you were involved in
- 4 the refurbishment project for Grenfell Tower over
- 5 a period of about a year in the capacity of design
- 6 manager; do you see that there?
- 7 A. Yes.
- 8 Q. I think you told us earlier that you were promoted to
- 9 the role of design manager before you worked on the
- 10 Grenfell project; is that right?
- 11 A. Yes.
- 12 Q. So you had acted as design manager for other major
- 13 projects for Harley?
- 14 A. Yes.
- 15 Q. In his evidence last week, Mr Ray Bailey indicated that,
- at the time of the Grenfell project, you were the
- technical manager, and that your job was to assess the
- 18 technical compliance of products. That was at
- 19 {Day32/17:21}. Do you agree with that? Were you the
- 20 technical manager?
- 21 A. No, I don't. I don't think I was made a technical
- 22 manager until, I don't know, end of 2015, beginning of
- 23 2016, perhaps, because I hadn't had any training in that
- 24 area yet.
- 25 Q. So there was a distinction, was there, within Harley

- 1 between the role of design manager, which you say you
- did perform, and the role of technical manager, which
- 3 you say you didn't perform until later; is that correct?
- 4 A. That's correct.
- 5 Q. As design manager, was your job or part of your job to
- 6 assess the technical compliance of products?
- 7 A. No.
- 8 Q. Whose role was that within Harley, under your
- 9 understanding?
- $10\,$  A. Prior to the technical -- the previous technical manager
- $11\,$  leaving, it would have been him. After he left, I'm not
- sure who that fell on.
- 13 Q. Who was that, when you are talking about him leaving?
- 14 A. That would have been Graham Hackley.
- 15 Q. Graham Hackley.
- When a technical manager was appointed after his
- departure, who was that?
- $18\,$  A. There wasn't one appointed until I'd done enough of the
- 19 degree to sort of start moving into that role.
- $20\,$  Q. I see, so that was the factor, was it, that meant you
- 21 ended up as technical manager --
- 22 A. Yeah
- 23 Q. -- having done enough of that façade engineering degree?
- 24 A. I think back then the commercial manager was struggling
- 25 to win work, because there wasn't enough technical

- 1 support, so he was keen for me to move over to that role
- 2 and help at the front end of the business.
- 3 Q. When you were the technical manager at Harley, did you
- $4 \hspace{1cm} \text{understand it to be part of your job to assess the} \\$
- 5 technical compliance of products?
- 6 A. Not at that point, because I wasn't qualified yet.
- 7 Q. So at what point did you think you were --
- 8 A. It would have been when I would have qualified to have
- 9 been able to, you know, cast opinions across the full
- 10 range of performance requirements.
- 11 Q. Did you ever get to that stage while you worked for
- 12 Harley?
- 13 A. No.
- 14 Q. No.
- Now, at paragraph 6 of your witness statement on
- page 2  $\{HAR00010149/2\}$ , you say there in the first line:
- $17\,$  "What was involved in the role of a Design Manager
- depended on a particular project and who else was on the
- team, but on the whole, it included being the designer
- 20 on individual projects as well as ensuring that the
- 21 other projects had sufficient design resource
- 22 (a designer) and that they kept to the building works
- 23 programme."
- 24 Do you see that there?
- 25 A. Yes.

127

- 1 Q. So can you just describe for us in a little bit more
- 2 detail what your role as design manager generally used
- 3 to entail.
- 4 A. Usually I would have a couple of projects myself that
- 5 I'd actually be working on and drawing the fabrication
  - drawings for, and then there would be a couple of
- designers in the office and it would be my
- 8 responsibility to make sure that they were keeping up
- 9 with their demands of work, making sure they were
- 10 keeping the project managers happy on site, and,
- $11 \hspace{1.5cm} \hbox{you know, maybe moving design resource around if} \\$
- a particular project was running behind.
- 13 Q. Yes.

6

- You also say in that last sentence of paragraph 6:
- This sometimes involved appointing external
- subcontract designers (as was the case with Grenfell )."
- Do you see that there?
- 18 A. Yes.
- $19\,$   $\,$  Q.  $\,$  Is an example of that the appointment of Kevin Lamb as
- the external subcontract designer for the Grenfell Tower project?
- 22 A. Yes, that's correct.
- 23 Q. Now, we will come back to his specific role later, but
- can you explain in general: who was it at Harley that
- would determine whether an external subcontractor would

1 be required?

- $2\,$   $\,$  A. I think it was just known that there wasn't enough
- $3\,$  design resource, and I think because -- do you mean in
- 4 general, or specifically for Grenfell?
- $5\,$   $\,$  Q.  $\,$  Who would take that decision on a project? Who would be
- 6 the person to say, "We need an external subcontract
- designer on this project"? Would that be you or would
- 8 that be someone else in Harley?
- 9 A. I think I would probably feed back that there wasn't
- 10 enough resource, and then they could either make the
- $11 \qquad \quad \text{decision to bring in someone external or to employ more} \\$
- 12 people.
- 13 Q. What process would Harley normally go through to appoint
- an external subcontract designer, can you help us on
- 15 that?
- 16 A. I think in the past, before Kevin, we had used a couple
- of companies, and usually it was, you know, word of
- mouth of other companies stating whether they were good
- 19 or not.
- 20 Q. Would Harley take any steps to ensure that these
- 21 external subcontract designers were competent to
- 22 undertake the role?
- 23 A. Not that I'm aware of.
- 24 Q. So you're not aware of any steps being taken to --
- 25 A. No, it would just be the -- you would probably seek

129

- 1 other people's feedback.
- $2\,$   $\,$  Q. So would references be taken from professionals involved
- 3 in other projects about their competence?
- 4 A. Yeah, but it would be not on an official -- not in
- 5 an official way, it would be that you would call up
- 6 people that they would work with and get feedback that
- 7 way.
- 8 Q. We will come back to Kevin Lamb later, but can you
- 9 recall that happening with Kevin Lamb's appointment?
- 10 A. I think that Harley had worked with Kevin before, and
- 11 I don't think anyone raised any issues with working with
- 12 him again.
- 13 Q. Yes.
- Now, if we can go to paragraph 14 of your witness
- statement, this is at the bottom of page 3
- $16 \hspace{1.5cm} \{ HAR00010149/3 \}, and on to page 4 \{ HAR00010149/4 \}, you$
- say there:
- "As the Design Manager for the Grenfell project myinvolvement included managing the Project Designer's
- work, managing the flow of information between the
- relevant project contractors or individuals, and helping
- 22 to ensure that we were keeping to the building works
- programme and dealing with any issues that arose.
- Because of my involvement in other projects I would
- often be dipping in and out of the Grenfell project."

130

- 1 Do you see that there?
- 2 A. Yes.
- 3 Q. Now, you say there that one of your roles was to manage
- 4 the project designer's work. Who was that on the
- 5 Grenfell project?
- 6 A. That would be Kevin Lamb.
- 7 Q. Given what you say there in that paragraph, does that
- 8 mean that you were not involved yourself in carrying out
- 9 the day-to-day design of the façade on the Grenfell
- 10 project?
- 11 A. As far as I can remember, that's correct. All I did
- from a design point of view was the structural design.
- 13 Q. Right, yes.
  - Who was it that was doing the façade design, then,
- in terms of --
- 16 A. Again --

14

- 17 Q. -- other aspects, not just structural?
- 18 A. Again, it's -- Kevin would be taking the architect's
- drawings and turning them into fabrication drawings.
- $2\,0\,$   $\,$  Q.  $\,$  Can you explain  $\,$  what your role involved in  $\,$  terms of
- 21 managing the project designer's work? What would that
- 22 involve?
- 23 A. So there -- at the beginning there wasn't a project
- 24 manager or a contracts manager involved, so it was to
- 25 try and get the design programme to meet the project

131

- 1 programme, try and scope out what period he would need
- 2 for design, what period would be needed for approvals
- from the client's team, and then any revisions that he
- 4 needed to do so that it could meet the fabrication
- 5 requirements.
- 6 Q. So it was scoping out periods he would need for design,
- 7 is that periods of time --
- 8 A. Yeah.
- 9 Q. -- he would need for design?
- 10 A. It would be basically trying to programme the works.
- 11 Q. Yes.
- 12 A. So, I mean, for example, you would kind of look at the
- building, work out how many drawings you thought you
- would need, and then try and roughly work out how long
- that would take to do.
- 16 Q. Yes.
- 17 A. And make sure that he was keeping to that.
- 18 Q. Yes
- 19 Did your role involve actually supervising the
- $20\,$  design work that was being done by the project designer
- 21 on the project?
- 22 A. Supervising it in the sense of the programme, yes.
- $23\,$  Q. But just limited to that, was it, only the programme?
- 24 A. Yeah
- 25 Q. So you weren't looking at the adequacy of the project

- 1 designer's work in any other way?
- 2 A. No, I'd pass those on to people in the company who
- 3 were -- well, from a structural point of view I would,
- 4 but from any other points of view, I would pass them on
- 5 to other people in the company.
- 6 Q. So who would you have been passing other aspects of the
- 7 design on to within the company?
- 8 A. People with more experience, like Mark Stapley or
- 9 Ray Bailey.
- 10 Q. I see. So in terms of supervising the extent to which
- 11 the design was compliant with the Building Regulations
- 12 and associated guidance, did you see that as part of
- 13 your role?
- 14 A. No.
- 15 Q. Was that made expressly clear to you when you worked at
- 16 Harley, or was that something that you just assumed?
- 17 A. I think with the amount of work I had on other projects,
- 18 I couldn't look at the designer's work. I can't
- 19 remember having a contract that said that it was or
- 20 wasn't involved.
- 21 Q. In terms of the supervision of the extent to which the
- 22 design was compliant with the Building Regulations, who
- 23 else within Harley did you think was responsible for
- 24 that?
- 25 A. I would have thought Mark Stapley and Ray Bailey.

- 1 Q. Does that mean Mark Stapley and Ray Bailey were
- 2 frequently sent the work of Kevin Lamb to check it for
- 3 compliance?
- 4 A. I think so.
- 5 Q. You think so?
- 6 A. Yeah, I can remember passing drawings on that Kevin had
- 7 sent in to see if they were what they wanted.
- 8 Q. I see. Now, you say at paragraph 9 of your witness
- 9 statement {HAR00010149/2} that you were involved in the
- 10 Grenfell project for a period of about a year in that
- 11 capacity as design manager, this was between June 2014
- 12 and May 2015; is that correct?
- 13 A. Yeah, roughly. I think because I had started to help
- 14 out a lot with the estimating at that point, I was
- 15 probably moving away from it quite a lot from early
- 16 2015.
- 17 Q. Yes. What about before June 2014? Did you have any
- 18 involvement in the project prior to that?
- 19 I can't remember, but I don't believe I did.
- 20 O. Yes.
- 21 You go on to say at paragraph 9, this is in the 22 fifth line:
- 23 "At the same time as being involved with the
- 24 Grenfell project I was also working as the designer on

134

25 two other Harley projects, Trinity Square (between

- 1 February 2013 and October 2015) and Compass House
- 2 (between October 2015 and March 2016), as well as
- 3 managing the design resource on other projects. From my
- 4 recollection, most of my time was taken up designing
- 5 these two other projects."
  - Do you see that there?
- 7 A. Yes.

6

11

19

- 8 Q. Just pausing there, that last sentence, "most of my time
- 9 was taken up designing these two other projects", what
- 10 do you mean by "designing"? Do you mean just structural
  - design or do you mean broader design?
- 12 It would be -- order design, drawing the fabricated
- 13 components to be ordered.
- 14 Sorry, I said "broader design"; I think you then said
- 15 "order design", did you?
- 16 Yeah, drawing the fabricated components for ordering.
- 17 Q. I see. So that's what you were doing on those two other
- 18 projects? A. Yeah.
- 20 Q. Ordering fabricated components?
- 21 Drawing fabricated components so they could be ordered.
- 22 Q. I see.
- 23 You have said there that most of your time was taken
- 24 up on these two other projects, and you say something
- 25 similar at paragraph 14, last sentence, on page 4

135

- 1 {HAR00010149/4}. You say:
- 2 "Because of my involvement in other projects I would 3 often be dipping in and out of the Grenfell project."
- 4 We looked at that earlier.
- 5 So is it right that your time was divided between
- 6 the design work on several different projects during
- 7 your time at Harley?
- 8 A. Yes, it was split between doing actual work on those two
- 9 other projects and then ensuring that Kevin was keeping
- 10 to the programme on the third project.
- 11 Q. I see, yes.
- 12 Were you working on any other projects at this time 13 other than those other two you have mentioned?
- 14 A. I would have been doing structural calculations on all
- 15 the projects going through at that time.
- 16 Q. What proportion of your time would you estimate you were
- 17 spending on the Grenfell project during that time, so
- 18 you have said between June 2014 and May 2015?
- 19 5% perhaps.
- 20 Q. So very little of your time?
- 21 Α.
- 22 Q. Were you very stretched at the time in terms of the work
- 23 you were having to do for Harley?
- 24 A. I think I was -- for the majority of this, I was almost

136

25 entirely focused on Trinity Square, because it was

- 1 a project that had had a lot of problems and we had had 2 a lot -- a high staff turnover. I'd even for a while
- 3 been solely based on that site without being in the
- 4 office at all.
- 5 Q. Would it be fair to say that your time was limited when 6 you were monitoring and supervising the progress of the
- 7 Grenfell refurbishment project?
- 8 A. Yeah, I had -- I was focused on Trinity Square.
- 9 Q. Now, just a few questions about the deleted emails. You
- 10 have dealt with this topic in your second witness
- 11 statement. Can we just turn to this. This is
- 12 {HAR00010513}. At paragraph 3 on the first page, in the
- 13 first two sentences, you explain there that you left the
- 14 employment of Harley Façades Limited in March 2016:
- "Prior to my leaving, it was agreed with the 16 Managing Director, Ray Bailey, that I could keep my work
- 17 laptop."

- 18 Do you see that there?
- 19 A. Yeah.
- 20 Q. You go on to say:
- 21 "To ensure I did not retain any Harley information,
- 22 it was agreed that I would delete it all from the
- 23 laptop. This included for example, access to the
- 2.4 server, all Harley emails, documents and design
- 25 drawings."

137

- 1 Do you see that there?
- 2 A. Yes.
- 3 Q. Then you go on to say:
- 4 "Accordingly, on my last day of employment at the
- 5 end of March 2016, I deleted any and all Harley
- 6 information."
- 7 Do you see that there?
- 8 A. Yes.
- 9 Q. As a professional, were you aware that it might be
- 10 important to retain records of your work?
- 11 A. Yeah, but that's why I believe everything would be kept
- 12 on the company server, because all the laptops just
- 13 attached into the server.
- 14 O. I see.
- 15 A. And all the emails were retained on there.
- 16 Q. So it was on that basis that you thought that the
- 17 information would be preserved in case it was required
- 18 in the future; is that correct?
- 19 A. That's correct.
- 20 Q. Now, you say at the end of paragraph 3 you believed at
- 21 the time that, whilst Harley's information would be
- 22 wiped from the laptop, it would be retained on the
- 23 company's server. Do you see that there?
- 24
- 25 Q. You have just mentioned that in your evidence.

1 Did you yourself check that before deleting the 2 information or was that an assumption you made?

- 3 A. Yeah, it was an assumption that I had made from the
- 4 system that had been set up.
- 5 Can we just have a look at Mr Ray Bailey's witness 6 statement at this point. This is {HAR00010184/21}, and
- 7 I want to look at paragraph 83.
- 8 Now, in the very bottom three lines of that page --
- actually, let's pick it up at the fourth from bottom 9
- 10 line, it says:
- 11 "As for Daniel Anketell-Jones, he left Harley some 12
- months before the fire . By that stage he had both 13 deleted all of his Harley related emails from his laptop
- 14 and had arranged with our service provider to remove his
- 15 email file from our systems."
- 16 Do you see that there?
- 17 A. Yes.
- 18 Q. I just want to ask you what was meant or what you think
- 19 he might have meant by that last part "had arranged with
- 20 our service provider to remove his email file from our
- 21 systems"? Can you help us as to what he is referring to
- 22 there?
- 23 I never contacted the service provider to remove the
- 24 email from the systems, so I don't know what he means by
- 25 that.

139

- 1 Q. Right, I see.
- 2 My question was going to be: if you had arranged to
- 3 remove your files from Harley's systems, how could you
- 4 have assumed that that information would remain on the
- 5 server? You know, you understand the point?
- 6 A. Yes, I understand the point, but --
- 7 Q. But you didn't arrange --
- 8 A. I didn't arrange for that to happen. I don't think
- 9 I would have had the authority or the security to do
- 10 that.
- 11 Q. So, as far as you were concerned, the information would
- 12 have stayed on Harley's server, and any emails, drawings
- 13 or documents which you sent or received in relation to
- 14 the project would have been recovered that way; is that
- 15
- 16 A. Yes, because in the past, where I had had a laptop break
- 17 or I had replaced a laptop, it was just a simple case of
- 18 connecting it back up to the server and you had all your
- 19 emails instantly once again.
- 20 Q. Are you aware of any information simply having been
- 21 lost? Is there any information you can recall that you
- 22 haven't seen in any Harley email since?
- 23 A. Not that stands out. It was a long time ago.
- 24 Q. Okay, yes.
- 25 Okay, I now want to just look at some of the

138

- previous projects you were involved in and turn to your
  CV first. Now, this is a CV which was provided by Rydon
  as part of their tender for the Grenfell Tower project,
  and if we can pull this up at {ART00002087/44}. We can
  see here this is a page that relates to you, "CV details
  Daniel Anketell-Jones", and then there is a profile
  under this.
- 8 Can you recall ever seeing this CV before it was 9 submitted by Rydon?
- 10 A. No, I've never seen this document before.
- Q. Now, if we look at the main paragraph under "Profile",it says that:
- "Daniel originally trained as a draughtsman. Daniel
  has worked on a number of similar projects to Grenfell
  Tower whilst with Harley. Daniel has been selected for
  this project due to his experience with tower block
- 17 refurbishment schemes."
- Do you see that there?
- 19 A. Yes.
- $20\,$   $\,$  Q. Now, it says there that you originally trained as
- a draughtsman; is that correct?
- 22 A. Yes.
- 23 Q. When was that? When did you train as a draughtsman?
- 24 A. "Train" I think is a loose term. Basically I had worked
- 25 with Kevin Lamb at his company, you know, drawing up

- $1 \qquad \qquad \text{details -- you know, when I first joined, it was drawing} \\$
- 2 up the details as he told me to draw them.
- $3\,$   $\,$  Q.  $\,$  Would you ever put in  $\,$  your own CV that you trained  $\,$  as
- 4 a draughtsman?
- 5 A. I don't think there's any reason why not to. I haven't.
- 6 Q. But you don't think it's inaccurate?
- 7 A. No.
- 8 Q. Okay. Then it says in the last line that you were
- 9 selected due to your experience with tower block
- 10 refurbishment schemes; do you see that there?
- 11 A. Yes.
- Q. Then on the right, under the heading "Benefits to theproject", it says here:
- "Daniel will provide the following specialist skill set."
- We have spec analysis, engineering, design
- detailing, budgetary control, design liaison. Do you
- 18 see that there?
- 19 A. Yes.
- 20 Q. Are they all accurate?
- 21 A. No.
- 22 Q. Which ones do you not agree with?
- 23 A. Spec analysis, budgetary -- and budgetary control.
- 24 Q. Can you help us as to how those items might have
- appeared in this CV that was put forward by Rydon?

142

- $1\quad \text{A.}\quad I \ \ \text{can't.}\quad \text{This was produced without my knowledge or}$
- 2 consent.
- 3 O. Yes.
- 4 Then we can see four previous projects that are
- referred to under "Relevant project experience": we have the Chalcots Estate project in Camden, the Ferrier Point
- the Chalcots Estate project in Camden, the Ferrier Point
   in Newham, the Wates Living Space in Little Venice and
- 8 the Buxton Group Castlemaine Tower, Wandsworth; do you
- 9 see that there?
- 10 A. Yes.
- 11 Q. Were you involved in all of those projects for Harley?
- 12 A. No.
- 13 Q. Which ones were you not involved in?
- 14 A. I wasn't involved in the Chalcots Estate job. That was
- being worked on when I first joined the company, and it
- was -- the Little Venice was the first job I worked on,
- and then I wasn't involved with the Castlemaine Tower,
- I don't believe. I can't even remember that one.
- 19 Q. Ferrier Point, were you involved in that one?
- 20 A. Yeah, I was involved in Ferrier Point.
- 21 Q. I see. So you weren't involved in the Chalcots Estate
- 22 project?
- 23 A. No.
- 24 Q. Did you work as design manager on the Ferrier Point
- 25 project?

143

- 1 A. I was responsible for detailing the fabrication details
- for that project. I can't remember what my title was at
- 3 that point.
- 4 Q. Okay.
- Now, we can see Ferrier Point involved a window
- 6 replacement and overcladding 23 storeys, that's what's
- 7 said here. You have just told us you were detailing the
- 8 fabrication drawings. Is that right?
- 9 A. Yes, that's correct.
- $10\,$  Q. Who at Harley had design responsibility for the design
- 11 of the façade in relation to those works?
- 12 A. It would have been the people overseeing that, which
- 13 again would have been my line manager, Mark Stapley, and
- 14 Ray Bailey.
- 15 Q. Who from Rydon did you work with on that project? Do
- you remember any particular individuals that you worked
- 17 with?
- 18 A. No.
- 19 Q. So I was going to ask you about the Chalcots Estate
- 20 project, but just to be clear, you didn't have any role
- 21 on that project; is that right?
- 22 A. I didn't have any role on that project.
- 23 Q. Did you know what the materials were that were used on
- 24 the Chalcots project for the façade?
- 25 A. I couldn't recount them. I know that they'd had some

- 1 issues with delaminated panels that came from one
- 2 supplier and they had to replace them with panels from
- 3 another supplier, but that was all I knew.
- 4 Q. Did you know what manufacturers had been involved in
- 5 terms of the cladding, the rainscreen cladding and the
- 6 insulation on that project?
- 7 A. No.
- 8 Q. Did you know that it was a Rockwool insulation that was
- 9 used?
- 10 A. No.
- 11 Q. And you didn't know that it was Reynobond panels?
- 12
- 13 Q. Were you aware that a fire had occurred in a flat on the
- 14 17th floor of Taplow House on the night of
- 15 16 January 2012?
- 16 A. I can't discern whether I knew that then or whether
- 17 I know it now, I'm afraid.
- Q. Okay. So you can't remember knowing that at the time? 18
- 19 A. No.
- 20 Q. Can we look at Harley's inspection report. This is at
- 21 {HAR000010169}. We can see that this was written just
- 22 very shortly after the fire. It says the date of the
- 23 incident was on Sunday 16th or Monday 17 January 2012,
- 24 and the date of this report is 17 January 2012. Do you
- 25 see that towards the top?

- 1 A. Yes.
- 2 Q. Then we've got various names here. We can see it 's
- 3 written by Tim Lovell, we see that one line up from the
- 4 bottom of that section.
- 5 A. Yes.
- 6 Q. We can see that you are also part of the distribution
- 7 for this report. Do you see your name there at the
- 8 bottom of that list under "Distribution"?
- 9 A. Yes.
- 10 Q. Can you recall receiving this report about the fire at
- 11 Taplow House?
- 12 A. No, I can't.
- 13 Q. Do you think you were sent it and just have not
- 14 remembered or ...?
- 15 A. Because I wasn't involved in the project, I may have
- 16 been sent it and not looked at it because I wasn't
- 17 involved.
- 18 Q. So you have no memory of ever reading this report into
- 19 the fire?
- 20 A. No, not until I've seen it recently.
- 21 Q. If we turn to page 4 {HAR00010169/4} of this document,
- 22 the author in the middle of this page, I want to look at
- 23 the paragraph below this photograph, says there:
- 24 "It was evident that despite the fire and the amount

146

25 of flammable items in the flat such as paper etc the

- 1 fire breaks were still intact and prevented the fire
- 2 spreading between flats. The Harley designed fire break
- 3 system is visible, now the surrounding fabric has melted
- 4 under the extensive heat."
- 5 Do you see that there?
- 6 A. Yes.
- 7 Q. Do you recall ever reading that or anything similar --
- 8 A. No.
- 9 Q. -- about this fire?
- 10 Were you aware that the Harley designed firebreak
- 11 system was still intact and had prevented the fire
- 12 spreading between flats?
- 13 A. I can remember people saying about how the fire hadn't
- 14 spread, but I wasn't aware of why it hadn't spread.
- 15 Q. So you were never told anything about the configuration
- 16 of either firestopping or cavity barriers in that façade
- 17 that --
- 18 A. No. 19 Q. -- was relevant to that fire?
- 20 A. No.
- 21 Q. Now, this report referred to the fact that a further
- 22 survey would be carried out, and we have that further
- 23 survey report, it was done by abseil. If we can turn to
- 24 that, this is at {CEP000003223}. So this is a further
- 25 report that was recommended after that initial
  - 147
- 1 inspection. Do you recall seeing this report at the
- 2 time you worked for Harley?
- 3 A. No, I don't believe I did.
- 4 Q. Now, we can see on page 2  $\{CEP000003223/2\}$  of this that
- 5 it is dated -- we see the date of report, five lines
- 6 down -- 23 January 2012. Do you see that there?
- 7 A. Yes.
- 8 Q. Again, you're there on the distribution list . You're
- 9 the last name on that distribution, together with
- 10 Mark Stapley and Graham Hackley of Harley. Do you see
- 11 that there?
- 12 A.
- 13 Q. I want to look at what's said at the bottom of page 2,
- 14 if we can look at the paragraph at the bottom of that
- 15 page, in the second sentence, if we pick it up, it says:
- 16 "The severity of the fire completely destroyed the
- 17 living room window. However, the fire was contained
- 18 from spreading to over floors by the extensive fire 19
  - breaks located at the head and cill of each window."
- 20 Do you see that there?
- 21
- 22 Q. Do you remember ever reading that or anything similar
- 23 while you were at Harley?
- 24 A. No, I think as before, because I wasn't involved in the
- 25 project, either I didn't receive it or didn't read it.

- 1 Q. So you don't recall being aware that firebreaks at both
- $2 \hspace{1cm} \text{the head of the window and the cill of the window had} \\$
- 3 played a role in terms of preventing fire spread?
- 4 A. No.
- 5 Q. Do you recall anybody discussing the importance of
- 6 cavity barriers or firestopping around windows after
- 7 this fire within Harley?
- 8 A. No.
- $9\,$   $\,$  Q. Do you recall anyone discussing the maintenance of
- 10 compartmentation after this fire and what was necessary
- 11 to maintain compartmentation in flats?
- 12 A. No.
- 13 Q. Okay.
- So is it right that, from your point of view, when
- Harley was designing the façade at Grenfell Tower, no
- consideration was given to the Taplow House fire and
- what had been learnt from that fire?
- $18\,$  A. Yeah. I didn't know about it, so I didn't feed it
- 19 through. I don't think anyone else fed it through.
- $2\,0\,$   $\,$  Q.  $\,$  And would Kevin Lamb have been aware of this, as  $\,$  far  $\,$  as
- 21 you were aware?
- 22 A. Not as far as I was aware, no.
- 23 Q. We can ask him later this week.
- Were you aware that Harley had used ACM cladding on
- high-rise buildings prior to the Grenfell Tower project?
  - 149
- 1 A. Yes, I was.
- 2 Q. So you were aware that they had used ACM?
- 3 A. Yes.
- 4 Q. Were you aware of that from your work on Ferrier Point?
- 5 A. And the Little Venice project.
- 6 Q. Yes.
- 7 Did you make any assumptions about how safe the
- 8 Reynobond cladding was because it had been used on
- 9 previous projects?
- $10\,$  A. I don't think I made any assumptions.
- 11 Q. You didn't make any assumptions at all?
- 12 A. No.
- 13 Q. About fire performance?
- $14\,$   $\,$  A. No. I was --  $\,$  my role was as a structural engineer, so
- it wasn't within my remit.
- 16 Q. Were you aware that Harley had used Rockwool as
- an insulation product on previous high-rise projects?
- 18 A. Yes.
- $19\,$   $\,$  Q.  $\,$  Did you ever apply your mind to the  $\,$  fire  $\,$  performance of
- 20 Rockwool insulation prior to the Grenfell Tower project?
- 21 A. No. Generally, if it was -- I think the only time that
- I would ever consider the fire performance would be if
- $23\,$   $\,$  it  $\,$  was a performance specification ,  $\,$  and we had been  $\,$
- $24\,$  given a U-value rather than a product, then if the
- product that we came up with to hit the U-value, then

150

- $1 \qquad \quad \text{those questions would be asked and it would be sent off} \\$
- 2 to the project's fire consultant to consider whether
- 3 that was usable. But it was always something that I put
- $4 \qquad \quad \text{back up the chain, because I didn't know about fire at} \\$
- 5 that point in my career.
- $\,$  G  $\,$  Q.  $\,$  I see. So, just to summarise, are you saying that the
- 7 only performance aspect you were ever looking at in
- 8 terms of these projects was the thermal performance?
- $9\,$  A. No, if it was -- there's prescriptive specifications
- thickness, and then there's performance specifications

where all the products are specified, the exact product,

- where they will say that they want it to be a certain
- U-value, a certain fire rating, and you have to then go
- out into the market and find products that hit that.
- When you find a product, you then put it back to the
- team to be approved.
- 17 So, if it was prescriptive, you would follow what
- they had already set, because it would have gone through
- 19 the design process and been checked by all the
- 20 consultants.
- 21 Q. If it was a fire performance that you had to hit, are
- you saying it wasn't any part of your role to check that
- a particular product didn't meet that fire performance?
- 24 A. If there was -- if the specification had a fire
- performance written in it, then we would try and find

151

- 1 that fire performance.
- Q. Yes, but would you always seek external advice on that?
- 3 A. Yes
- 4 Q. I see. Okay.
- 5 Mr Wehrle for Arconic has given evidence that he had
- 6 certain conversations with representatives of Rydon
- during the Chalcots Estate project. Do you recall ever
- 8 meeting a Mr Wehrle of Arconic?
- 9 A. I've never heard of Mr Wehrle.
- 10 Q. Were you ever on site during the Chalcots project?
- I think you have told us you weren't involved; is that
- 12 correct
- 13 A. No, I wasn't involved. I drove past it once with
- Tim Lovell who pointed at it and said that was the
- project, but that was it.
- 16 Q. Did you ever hear anybody else within Harley discussing
- meeting a representative of Arconic on the Chalcots
- 18 project?
- 19 A. No
- Q. Now, I want to consider in a little bit more detail yourunderstanding of the regulatory requirements at the time
- of the Grenfell project.
- Were you familiar yourself with the requirements of the Building Regulations 2010 when you were working on
- 25 the Grenfell project?

- A. No. I would have been mainly focused on Euro codes for 2 structural engineering.
- 3 Q. The Euro codes for structural engineering?
- 4 A. (Witness nods).
- 5 Q. Yes. Were you aware that there was a thing called the
- 6 Building Regulations --
- 7 A. Yes, I was.
- 8 Q. -- that had to be complied with? You were aware of
- 9 that.
- 10 Were you aware that the Building Regulations
- 11 contained functional requirements that had to be met?
- 12 As far as structural engineering, I would have been
- 13 aware of it, because the Euro codes are designed to
- 14 satisfy those functional requirements.
- 15 Q. Yes.
- 16 Were you aware that there were functional
- 17 requirements in terms of fire performance?
- 18 A. I would have been able to logically deduce it. There
- 19 were functional requirements for all parts of the
- 20 building.
- 21 Q. Were you aware that there was a part B in schedule 1 of
- 22 the Building Regulations that was relating to
- 23 fire safety?
- 24 A. Yes, I was aware of it.
- 25 Were you aware that part B divided down into parts B1

- 1 through to B5?
- 2 A. No, I wasn't.
- 3 Q. So had you heard of the B4 functional requirement in
- 4 terms of a wall adequately resisting the spread of fire?
- 5 A. Not at that time, no.
- 6 Q. Can we just look at Approved Document B, this is at
- 7 {CLG00000224}. This is the 2013 edition of Approved
- 8 Document B on fire safety.
- 9 I think before you said you weren't familiar with
- 10 Approved Document B at the time of the Grenfell project;
- 11 is that right?
- 12 A. Yeah, not like I am now.
- 13 Q. Had you looked at it at all at the time of the Grenfell
- 14 project?
- 15 A. I think I had probably been sent parts of it by
- 16 consultants and manufacturers, but generally just to
- 17
- 18 Q. Had you ever sat down and read any bits of it yourself?
- 19 Not that I remember, no.
- 20 Q. Did you know what the purpose was of this kind of
- 21 practical guidance?
- 22 A. Not at that time in my career, no. I mean, now I can
- 23 look back on it and say that it is the same as Euro
- 24 codes, it's a way of satisfying the
- 25 Building Regulations, but at the time I was -- my focus

154

- 1 was structural engineering, so I wouldn't have known
- 2 that that was doing the same thing as the Euro codes.
- 3 Q. Yes.

4 Can we turn on to page 93  $\{CLG00000224/93\}$  where we 5 see B4, functional requirement B4 of schedule 1 of the

Building Regulations. Do you see that there?

7 A. Yes.

6

8 Q. B4.(1):

9 "The external walls of the building shall adequately 10 resist the spread of fire over the walls and from one 11 building to another, having regard to the height, use

12 and position of the building."

13 I just summarised that for you earlier and asked you 14 if you are familiar with it, and I think you said no.

- 15 Is that correct?
- 16 A. Yes, that's correct.
- 17 Q. Then if we turn on to page 95 {CLG00000224/95} of this,
- 18 at paragraph 12.5 there is a section beginning,
- 19 "External wall construction" at the bottom of that page.
- 20 If we can just zoom in on that.
- 21 So here there is a warning. It says this:

22 "The external envelope of a building should not 23 provide a medium for fire spread if it is likely to be a 24 risk to health or safety. The use of combustible

25

materials in the cladding system and extensive cavities

155

- 1 may present such a risk in tall buildings."
- 2 Do you see that there?
- 3 A. Yes.
- 4 Now, were you aware of that warning at the time of the
- 5 Grenfell project?
- 6 A. No.
- 7 Q. Were you aware in general terms that the use of
- 8 combustible materials and extensive cavities may present
- 9 a risk in tall buildings?
- 10 A. I was aware that it was something that people were
  - cautious of, and needed to be run by the consultants to
- 12 make sure that whatever was being used complied.
- 13 Q. I see.

11

14 The next paragraph under 12.5 says this:

15 "External walls should either meet the guidance 16 given in paragraphs 12.6 to 12.9 or meet the performance 17 criteria given in the BRE Report Fire performance of

18 external thermal insulation for walls of multi storey

- 19 buildings (BR 135) for cladding systems using full scale 20
- test data from BS 8414 ..."
- 21 Do you see that there?
- 22 A. Yes.
- 23 Were you aware at the time that there was guidance
- 24 suggesting that external walls should either meet the
- 25 guidance given in this document or meet the performance

- criteria in BR 135 with test data from 8414 testing?
- 2 A. I was aware that there was performance criteria that the
- 3 fire consultants worked to, but I wouldn't have been
- 4 able to say what it was.
- 5 Q. And you weren't aware of the difference between
- 6 following this guidance and having had a test carried
- 7 out on a cladding system?
- 8 A. No, I wasn't.
- 9 Q. So is it right that you can't tell us, when Harley was
- doing its design work on the façade, whether anyone was
- following the guidance in 12.6 to 12.9 or meeting the
- 12 performance criteria in BR 135?
- 13 A. I would have thought that we would be trying to follow
- something, and then passing it back to see if it
- complied, because I don't know -- I certainly didn't
- 16 know whether it complied or not.
- 17 Q. When you say, "I would have thought that we would be
- trying to follow something", can you give us any
- indication of what Harley might have been trying to
- 20 follow in its design work?
- 21 A. From past projects, we'd always followed what we'd
- been -- what had been put in the prescriptive design and
- then that had been signed off by the fire consultants,
- so we probably would have been following that same
- $25\,$  approach of taking the initial design, following it and

- $1 \hspace{1.5cm} \hbox{then expecting it to be signed off by a fire consultant.} \\$
- $2\,$   $\,$  Q. Were you aware that in  $\,$  this  $\,$  guidance document there was
- 3 special guidance around buildings above 18 metres?
- 4 A. I knew that there was something special about buildings
- 5 above 18 metres, that there was a different criteria
- 6 that had to be met, but I wouldn't have been able to say
- 7 what that criteria was.
- $8\,$  Q. Can we look at paragraph 12.6. It's at the bottom of
- 9 that page there. We have a heading "External surfaces",
- do you see that there?
- 11 A. Yep.
- 12 Q. It says there, 12.6:
- 13 "The external surfaces of walls should meet theprovisions in Diagram 40."
- Do you see that there?
- 16 A. Yes.
- 17 Q. If we can look at diagram 40, which is on page 97
- 18 {CLG00000224/97}, was that a diagram that you had ever
- $19 \hspace{1.5cm} \text{seen at the time you were working on the Grenfell} \\$
- 20 project?
- 21 A. Yes, I think suppliers had sent it to us before, but ...
- $22\,$   $\,$  Q.  $\,$  Did you know yourself how to interpret  $\,$  that in  $\,$  terms of
- 23 the guidance it was giving?
- 24 A. No.
- 25 Q. Did you know that for Grenfell it would be the bottom

158

- 1 right-hand sketch there, "e. Any building", which would
- 2 be applicable?
- 3 A. I can't remember, but logically it looks like the right
- 4 one

6

8

- 5 Q. Now, diagram 40 required something called national
  - class 0 or European class B-s3, d2 or better. We will
- 7 come back to national class 0 later, but the
  - class B-s3, d2, did you understand that at the time of
- 9 the Grenfell project?
- 10 A. No, until I did the degree with Bath, I wasn't aware of
- the European classifications at all.
- 12 Q. Yes. So you wouldn't have known what the s3, d2 meant
- 13 either?
- 14 A. Not at that point, no.
- 15 Q. If we go to page 96  $\{CLG00000224/6\}$  and look at
- paragraph 12.7, it states there:
- 17 "In a building with a storey 18m or more above
- ground level any insulation product, filler material
- $19 \hspace{1.5cm} (not \ including \ gaskets, \ sealants \ and \ similar) \ etc. \ used$
- $20\,$   $\,$  in the external wall construction should be of limited
- 21 combustibility ..."
- Do you see that there?
- 23 A. Yes
- 24 Q. Were you aware of that guidance more generally at the
- 25 time you were working on the Grenfell project?

159

- 1 A. No.
- 2 Q. Had you ever heard of the phrase "limited
- 3 combustibility"?
- 4 A. Yes, I had. I thought -- I thought it was just the same
- 5 as like class 0 or 1, that it meant it didn't burn very
- 6 much.
- 7 Q. So did you appreciate that, within this guidance
- 8 document, there was a specific definition of limited
- 9 combustibility and what tests had to be undergone to
- 10 meet that phrase?
- 11 A. No, I didn't.
- $12\,$   $\,$  Q. So does it follow that you weren't aware that this
- $13 \qquad \quad \text{guidance required the insulation product to be of} \\$
- 14 limited combustibility?
- 15 A. No, not at that point, because I was just -- I was
- responsible for the structural design, I wasn't educated
- in this.
- 18 Q. Yes. Okay.
- Now, in terms of other specialist guidance
- $20\,$  documents, industry guidance at the time, had you heard
- of the Building Control Alliance, the BCA?
- 22 A. I think that, yeah, I'd heard of it as the BCA.
- 23 I didn't know it stood for Building Control Alliance.

Were you aware at the time of the Grenfell Tower project

25 that the BCA issued guidance documents for the

160

2 A. Looking back on it now, I can remember people talking 3 about technical notes, but I didn't know who they were 4 issued by. Now I can connect the two together. 5 Q. If we can just look at, this is a piece of BCA guidance, 6 {CEP00057294}, and this is Technical Guidance Note 18, 7 "Use of combustible cladding materials on residential 8 buildings", dated June 2014. Do you see that there? 9 A. Yes. 10 Q. Now, at the time of the Grenfell project, were you 11 familiar with this document? 12 Looking back on it, I can remember people telling me 13 that they'd had desktop studies done for things, and on 14 other projects we sent desktop studies off to the fire 15 consultants to be cross-checked and approved or 16 rejected, but it's only looking back on it now that 17 I know that that came from this document. 18 Q. Did you read this document, do you think, at the time of 19 the Grenfell project? 20 A. I don't believe so. 21 Now, we can see that you were sent this version of the 22 BCA guidance on 8 April 2015 by Jonathan Roome at 23 Celotex. If we could just pull that up, this is at 24 {CEL00003628}. Again, I'll come back to this email 25 later when we're talking about Celotex in more detail. 161 1 What I want to note here is that, if you look at the 2 third paragraph of this email to you on 8 April 2015, he 3 says: 4 "I have attached the Building Control Guidance notes 5 for insulation products above 18m which seem to be doing 6 the rounds at the moment." 7 Do you see that there? 8 A. Yes. 9 O. There was an attachment to this email which was the 10 guidance note I was just showing you. 11 Can you remember what you did with that guidance 12 when it was sent to you by Mr Roome? 13 A. No, I can't. 14 Q. Do you recall whether you passed it on to any other 15 Harley employees? 16 A. No, I can't. 17 Q. Or Kevin Lamb? 18 A. No. 19 Or to Studio E? 20 A. No. 21 Q. Or Rydon? 22 A. No. 23 Q. Just to be clear, you weren't familiar with it before 24 this point; is that right? 25 A. No, I wasn't familiar with it . I can remember just that

162

1 people used to talk about the desktop studies as a way 2 of getting something approved, and that we'd send them 3 4 Q. Can we go back to that Technical Note 18, {CEP00057294}. 5 It tells us in the first paragraph under "Purpose" that: 6 "... technical guidance notes are for the benefit of 7 its members and the construction industry, to provide 8 information, promote good practice and encourage 9 consistency of interpretation for the benefit of our 10 clients." 11 Do you see that there? 12 A. Yes 13 0. "They are advisory in nature and in all cases the 14 responsibility for determining compliance with the 15 Building Regulations remains with the building control 16 body concerned." 17 Do you see that there?

18 A. Yes.

19 Q. If we then go down in this document under 20 "Introduction", it says there:

21 "Section 12 of Approved Document B2 gives guidance 22 on the acceptable use of combustible materials within 23 the external cladding system.

24 "Where a building exceeds 18m in height, AD B2 25 recommends (for the entire wall area both below and

163

above 18m) either the use of materials of limited combustibility for all key components or to submit evidence that the complete proposed external cladding system has been assessed according to the acceptance criteria in BR135 ..."

Do you see that there?

7 A. Yes.

1

2

3

4

5

6

8 Q. Now, again, were you aware that there was guidance from 9 this Building Control body, the Building Control 10 Alliance, along those lines about using materials of 11 limited combustibility for all key components or 12 submitting evidence that the proposed external system

13 has been assessed according to BR 135? Were you aware

14 of that at the time?

15 A.

16 Q. So did you ever give any consideration to what materials 17 of limited combustibility for all key components meant?

18 No, I'd never read this, so I didn't.

19 So even though you're sent it by a representative of 20 Celotex, you wouldn't have thought to read this?

21 A. I think we were getting a lot of pressure from Celotex 22 and a lot of sales material at that time. I can't 23 remember reading it.

164

24 Q. Now, under "Key issues", immediately below that, this

25 guidance says, if we read from the first bit:

1

construction industry?

1 "Fire spread via the external wall medium is 2 exacerbated by the use of combustible materials and 3 extensive cavities." 4

Do you see that there?

- 5 A. Yes.
- 6 Q. That mirrors what we saw before in 12.5, do you
- 7 remember, of ADB, where it was highlighting the same
- 8 risks? Do you recall that, just a minute ago?
- 9 A. Yes.
- 10 Q. The guidance goes on:
- 11 "The speed by which a flame rises vertically up the 12 external face of a building leads to potentially rapid 13 fire spread from lower floors to higher ones. Within
- 14 the confines of a cavity, the flame will also elongate 15 up to ten times its length as it searches for oxygen."
- 16 Do you see that there?
- 17 A. Yes.
- 18 Q. Were those risks that you were generally aware of at the
- 19 time of the Grenfell project?
- 20 A. I don't think to this extent. I think at the time my 21 understanding was just that you could get unseen spread
- 22 of flame, so not that it would spread so high or so
- 23 quickly.
- 24 Q. Yes.
- 25 A. And then that's why you had to put in cavity barriers.

165

- 1 Q. Yes.
- 2. A. To stop the unseen spread of fire.
- 3 Q. So it goes on:
- 4 "Hence, the need for robust cavity barriers,
- 5 restricted combustibility of key components and the use
- 6 of materials with a low spread of flame rating is
- 7 necessary, particularly given the delamination and
- 8 spalling nature of some of the components when heated."
- 9 Do you see that there?
- 10
- 11 Q. Again, were you aware of all of that in general terms at
- 12 the time of the Grenfell project?
- 13 A. Not of the -- not of the delamination, spalling, no, and
- 14 the combustibility part I would have thought would have
- 15 been assessed before, you know, being sent out on
- 16 a particular project.
- 17 Q. Yes.
- A. So when we received the materials to be used on 18
- 19 a project, I would have assumed that this work had been
- 20 checked previously.
- 21 Q. Yes.
- 22 Now, a little further down, if we pick up in the
- 23 third paragraph there under "Key issues", it says there:
- 24 "A Surface Spread of Flame Classification does not
- 25 infer any resistance to combustibility, it is solely a

166

- 1 measure of the spread of a flame across the surface."
- 2 Do you see that?
- 3 A. Yes.
- 4 Again, did you understand that at the time you were
- 5 working on the Grenfell project?
- 6 A. No, that wasn't something that I was -- as far as I'm
- 7 aware, I wasn't made aware of that until I went to
- 8 university.
- 9 Q. Did you understand that surface spread of flame
- 10 classifications might be referring to class 0 or
- 11 national class 0?
- 12 A. I just understood that class 0 meant that it wouldn't
- 13 catch fire.
- 14 Q. Okay.
- 15 Then there are some bullet points under that
- 16 paragraph, and it says this:
- 17 "Thermosetting insulants (rigid polyurethane foam
- 18 boards) do not meet the limited combustibility
- 19 requirements of AD B2 Table A7 and so should not be
- 20 accepted as meeting AD B2 paragraph 12.7."
- 21 Do you see that there?
- 22 A. Yeah.
- 23 Again, were you aware at the time of the project that
- 24 thermosetting insulants didn't meet the limited
- 25 combustibility requirements and so should not be

167

- 1 accepted as meeting parts of the ADB guidance?
- 2. A. No. I just wasn't looking at this kind of thing. I was
- 3 focused on fabrication and structural design.
- 4 Q. Were you aware that thermosetting insulants such as PIR,
- 5 polyisocyanurate foam or phenolic foam were not of
- 6 limited combustibility and therefore were only compliant
- 7 if included as part of a cladding system tested to
- 8 BR 135 and 8414?
- 9 A. No. I wasn't, for the same reasons mentioned before.
- 10 Q. Did you ever apply your mind to whether the insulation
- 11 at Grenfell Tower was of limited combustibility?
- 12 A.
- 13 Q. Did you ever seek any assurances that the insulation was
- 14 of limited combustibility?
- 15 A. No.
- 16 Q. Did you ever apply your mind to whether the insulation
- 17 at Grenfell Tower had been tested to BR 135 and BS 8414?
- 18 A. I don't -- don't remember, no.
- 19 Q. Were you aware that any such testing referred to the
- 20 complete assembly, and it referred to system testing, as
- 21 opposed to the testing of one component?
- 22 A. No.
- 23 Q. Finally, under this same section, there is a bullet
- 24 point there right at the very bottom. It says:
- 25 "The BR135/BS8414 tests deal solely with the spread

1 of fire once it has entered the cavity. Hence, the 2 requirements for cavity barriers in accordance with 3 Section 9 of AD B2 are required in all cases including 4 around openings in the façade." 5 Do you see that there? 6 A. Yes. 7 Q. Were you aware that there was industry guidance at this 8 time which specifically drew attention to the importance 9 of including cavity barriers around openings in the 10 façade? 11 A. No, I wasn't. I was aware that you needed cavity 12 barriers, and on other projects that we'd been involved 13 with, we drew elevations that showed where we were 14 intending to put the cavity barriers, and they would be 15 sent off to the consultant for them to approve or add 16 additional ones where they thought they were necessary. 17 MS GRANGE: Okay, thank you. 18 Mr Chairman, I think that would be an appropriate 19 moment for a break, thank you. 20 SIR MARTIN MOORE-BICK: Thank you. 21 Well, Mr Anketell-Jones, we will have a break now. 22 We will take about quarter of an hour, and we will come 23 24 While you are out of the room, please don't talk to 25 anyone about your evidence or anything to do with it. 169

1 All right? THE WITNESS: Yes, sir. 2.

3 SIR MARTIN MOORE-BICK: If you would like to go with the

(Pause)

4 usher, she will look after you.

5 THE WITNESS: Thank you.

6 SIR MARTIN MOORE-BICK: Thank you very much.

8

Right, 3.35, please. Thank you.

9 (3.19 pm)

7

10 (A short break)

11 (3.35 pm)

12 SIR MARTIN MOORE-BICK: Right, ready to carry on?

13 THE WITNESS: Yes, sir.

14 SIR MARTIN MOORE-BICK: Thank you.

15 Yes, Ms Grange.

16 MS GRANGE: Thank you, Mr Anketell-Jones.

17 We were looking before we broke at the Building 18 Control Alliance guidance from June 2014 that you were

19 sent in April 2015 by Mr Roome; yes?

20 A. Yes.

21 Q. And I want to go back to that and look at page 2 of it, 22 {CEP00057294/2}. We can see here that what it does is

23 set out different options, three routes to compliance,

24 with paragraph 12.7 of ADB. We have option 1, option 2 25 and then at the bottom of the page option 3. Do you see

170

1 that there?

2 A. Yes.

3 Q. Were you aware at the time of the Grenfell project that

4 there were in general terms these different options for

5 complying with the guidance to the Building Regulations?

6 A. I think the only one that I was aware of was the desktop 7 studies by the fact that we'd submitted others on other

8 projects to the fire consultants for approval.

9 Q. Were you aware of what that desktop study report was 10 showing? What was that trying to demonstrate?

11 It was demonstrating that it was compliant by using fire 12 engineering rather than testing.

13 O. I see.

14 So option 1 was to use materials of limited 15 combustibility for all elements of the cladding system

16 above and below 18 metres; you see that there?

17 A. Yes.

Q. Option 2 was an acceptable alternative approach is to 18 19 submit evidence that the complete proposed external 20 cladding system has been assessed according to the

21 BR 135 criteria by 8414 testing; do you see that there?

22 A. Yes.

23 Then option 3 is the desktop study report from 24 a suitably independent UKAS accredited body stating

25 whether, in their opinion, the BR 135 criteria would be

171

1 met with the proposed system. Do you see that there?

2 A. Yes.

3 Q. In general terms, were you aware of the distinction

4 between system testing and the other route, which was

5 about individual products being, for example, of limited

6 combustibility? Were you aware of that distinction?

7 A. No.

8 Q. In respect of option 2, did you ever make any 9 investigations as to whether a specific BS 8414 test had

10 been done using the system specified for Grenfell?

11 A. No, because I wasn't involved in that part, I was

12 involved in the structural design.

13 Q. In respect of option 3, did you or anyone else make any

14 investigations as to whether a desktop study had been

15 undertaken on the system that had been specified for

16 Grenfell?

17 A. Not as far as I'm aware.

18 Q. So you're not aware of any desktop study being

19 commissioned in respect of the Grenfell Tower project?

20 A. No.

21 Q. Do you recall taking any steps yourself to ensure that

22 the system at Grenfell Tower satisfied one of these

23 three options for demonstrating compliance?

24 A. No, because my responsibility was to do the structural 25 design.

- Q. Whose responsibility was it within Harley to ensure that
   the cladding system satisfied one of these options for
- 3 compliance?
- $4\,$  A. At that time, as we had no technical manager, it would
- 5 have fallen to the senior designer -- to the senior
- 6 management.
- 7 Q. So who would that have been at the time in Harley?
- $8\,$   $\,$  A. Would have been the directors , which would have been
- 9 Mark Stapley and Ray Bailey, and Mark Harris.
- 10 Q. Do you have a recollection of them actually considering
- the compliance of the Grenfell Tower system with
- relevant guidance at the time? Do you remember them
- doing that?
- 14 A. No.
- $15\,$  Q. Did you ever raise the question of what route to
- compliance you were adopting with anyone at Harley?
- 17 A. No, because I was just looking at the structural design.
- 18 Q. Or anyone else on the project, Studio E or Rydon?
- 19 A. No.
- $20\,$  Q. Can we look at your first  $\,$  main witness statement at
- 21 paragraph 33, this is  $\{HAR00010149/8\}$ . You say there:
- $\begin{tabular}{ll} 22 & & \end{tabular} \begin{tabular}{ll} \be$
- Technical Guidance Note 18 available at the time (June 24 2014 version) was also misleading and offered a way of
- 25 circumnavigating the requirement of paragraph 12.7 of

- $1 \qquad \quad \text{Approved Document B through Option 3. This third option} \\$
- 2 allowed a 'desktop study' to be carried out ..."
- 3 Do you see that there?
- 4 A. Yes.
- 5 Q. Can you just explain to us in what way this
- 6 Technical Guidance Note 18 was misleading, in your view?
- 7 A. I just -- from my knowledge now, I see it as open to
- 8 interpretation. You would get different fire
- 9 consultants comparing results from other tests, and
- 10 making different conclusions from that, and to me that
- 11 isn't clear enough. If two fire consultants can come up
- $12 \hspace{1cm} \text{with different opinions, it's not clear and must be} \\$
- 13 misleading.
- $14\,$   $\,$  Q. You started that answer by saying, "From my knowledge
- $15\,$  now"; does that mean that, at the time of the Grenfell
- project, you didn't consider this guidance misleading?
- 17 A. No, I didn't know about this guidance at that point.
- 18 Q. You talk about it "offered a way of circumnavigating the requirement of paragraph 12.7 of Approved Document B",
- 20 do you see that there?
- 21 A. Yes.
- 22 Q. Were you aware at the time of the Grenfell project of
- a culture of professionals circumnavigating some of the

174

- 24 guidance in the approved documents?
- 25 A. No.

- $1\,$   $\,$  Q. So what direct experience do you have of that? You say,
- 2 "offered a way of circumnavigating the requirement at
- $3\,$  paragraph 12.7". Do you say that you do have direct
- 4 experience of that?
- 5 A. Since leaving Harley I've got experience of different
  - manufacturers trying to put forward products that they
- say they have desktop studies for, where they've quite
- 8 often not been carried out by a UKAS body, and when they
- 9 have been put forward to the fire consultants they've
- been rejected.
- 11 Q. I see. But just to be clear, that wasn't something you
- were aware of at the time of the Grenfell project?
- 13 A. No.

6

- 14 Q. We were just looking at the June 2014 version of the BCA
- guidance; I would just now like to take you to a later
- $16\,$  edition of that same guidance from June 2015. This is
- 17 at {CEL00002347}.
- Now, do you have any recollection of reading this
- further version of the guidance at the time you were
- 20 involved in the Grenfell project?
- 21 A. No.
- $22\,$   $\,$  Q.  $\,$  On page 1, what we can see under "Key issues ",  $\,$  if  $\,$  we go
- down that page and look at the bottom half of that page,
- $24\,$   $\,$  in the third paragraph under "Key issues" we see the
- 25 same sentence about a surface spread of flame

175

- 1 classification not inferring any resistance to
- 2 combustibility, and then in the first bullet point it
- 3 talks about thermosetting insulants not usually meeting
- 4 the limited combustibility requirements, but it gives
- 5 more examples in the part in parenthesis, in brackets,
- 6 in that first line. Do you see there it says:
- 7 "... (e.g. rigid polyurethane, polyisocyanurate,
- 8 polystyrene foam boards) ..."
- 9 Do you see that there?
- 10 A. Yes.
- $11\,$   $\,$  Q.  $\,$  I  $\,$  want to ask you, I know you said you didn't  $\,$  read this
- 12 guidance, but were you aware at the time of the Grenfell
- project that insulants such as polyisocyanurate, PIR,
- didn't meet certain requirements of ADB?
- 15 A. No, I wasn't.
- 16 Q. Were you aware that they should only be accepted as
- meeting paragraph 12.7 of ADB if they were included as
- part of a cladding system tested to BR 135 and BS 8414?
- 19 A. No, I wasn't.
- Q. Were you aware of polyisocyanurate foam boards at the
- time of the Grenfell project?
- 22 A. No
- 23 Q. So if you had been asked to name some manufacturers of
- 24 PIR boards at the time, you wouldn't have been able to

176

25 tell us?

A. I don't believe so, no. 1 A. No. 2 2 Q. Now, I now want to look at the CWCT. We talked about Q. Do you have any recollection of speaking to 3 them briefly, and I think you confirmed that Harley was 3 representatives of Celotex at CWCT members' meetings? 4 4 a member of the CWCT at the time of the Grenfell A. No, I don't. 5 project; that's right, isn't it? 5 Q. Were you personally aware at this time that there were 6 6 guidance notes produced by the CWCT? A. Yeah, I believe so. It was ... I think the membership 7 7 was dealt with by Mark Stapley and Graham Hackley. A. I can't honestly remember at what point I became aware 8 8 Q. Yes. of them 9 9 Now, can we look at a document. This is Q. Let's have a look at a document. This is {CWCT0000019}. 10 {CEL00009876}, and we will need the offline version to 10 So this is a document that we know was produced in 11 be able to see it clearly. 11 March 2011, and it's entitled "Technical Note 73, Fire 12 Now, we're going to come back to this in the context 12 performance of curtain walls and rainscreens". Do you 13 13 see that there? of looking more carefully at the insulation, but for 14 14 now, this is an entry from the Celotex Salesforce 15 database. It's not very easy to read, but in the top 15 Q. Is this familiar to you? Had you seen this by the time 16 right it relates to something called Merit House, and, 16 you worked on the Grenfell project? 17 if you look on the right-hand side at the top, we can 17 A. It's familiar to me now. I can't remember when it would 18 see "Related To: Merit House", and then underneath it 18 have become familiar to me. I think that because I was 19 19 says "Name: Daniel Anketell-Jones". Can you see that? primarily focused on structural stuff before becoming --20 20 you know, being put forward for doing the MSc, I think A. Yeah. 21 21 Q. Under the comments, you can see there it says, "Met Dan it wouldn't have been until sort of the end of 2015 or 22 22 at the CWCT Members Meeting". Do you see that there? something before I started appreciating that these 23 23 A. documents existed. 24 Q. This appears to be an entry from around October 2014. 24 Q. Right. 25 25 Well, it says last modified by Mark Willoughby on Now, if we look at the top of the -- sorry, no, if 177 179 1 1 13 October 2014, I think, in the bottom right-hand we look at the bottom of page 1 and over to page 2 2 2 corner. {CWCT0000019/2}, this guidance begins to draw attention 3 Do you remember attending a CWCT members' meeting in 3 to different descriptions and classifications of 4 October 2014? 4 materials under the Building Regulations. If we can go 5 A. I don't remember. 5 right down to the bottom of this page. 6 6 Q. Do you ever remember meeting a representative of Celotex (Pause) 7 7 at a CWCT members' meeting? I can see it peeping out at the bottom, it's a text 8 8 A. No, I don't remember. beginning: 9 9 Q. Can you help us as to what occurred at the members' "In England, Wales and Northern Ireland ..." 10 meetings? 10 That's the bit I want to look at. There we go. So 11 11 A. We used to go to talks, I can't remember if they were it begins here: 12 CWCT or by other either product suppliers or just sort 12 "In England, Wales and Northern Ireland, materials 13 of general talks, but I wouldn't know what this one was 13 may be described as non-combustible, of limited 14 14 combustibility or Class 0 using definitions given in 15 15 Q. Were you aware at the time of the Grenfell project that AD B." 16 16 Harley had access to the benefits of CWCT membership, Do you see that there? 17 including updates on technical training, publications 17 A. Yes. 18 and certification work? 18 Q. Then it says: 19 19 A. I think until I sort of was asked to consider training "Materials may also be classified as Class 1, 2, 3 or 4 in accordance with BS 476 Parts 6 and 7." 20 into the technical role, I was primarily concerned with 20 21 structural issues, so I don't remember much about the 21 Then it says: 22 22 CWCT at that point. "Equivalent European classifications are also used." 23 23 Q. I see. But you wouldn't have been talking to Did you have any understanding at the time of the 24 representatives of Celotex about structural issues, 24 Grenfell project of the difference between 25 would you? 25 non-combustible, limited combustibility and class 0

178

1 materials? 2 A. No, I didn't. 3 Q. Were you aware of a distinction between class 0 and 4 limited combustibility? 5 A. No. 6 7 8 you say this: 9 10 11

Q. Now, can we look at paragraph 27 of your witness statement at this point. This is {HAR00010149/6}. So

"At the time of the refurbishment the main source of guidance was (and still is) Approved Document B which is a document produced by the government. The requirement under Approved Document B is that the external surfaces of materials used on a building over 18 metres are Class 0 and therefore the relevant British Standard would be BS476. Also, any insulation product used in

the external wall construction should be of limited combustibility."

18 Now, do you see that there?

19 A. Yes.

12

13

14

15

16

17

20 Q. So that's the evidence you're giving us in your witness 21

22 Can we just go back and see what question you're 23 answering there. So we're asking you:

24 "Was the exterior ... compliant with relevant 25 building regulations, fire regulations ..."

181

1 Et cetera.

2 Do we take it from that that what you are telling us 3 is what you know now and not what you knew at the time Δ of the project?

5 A. No, this is learning it from the fire and acoustics 6 course that you mentioned before, and also having 7 actually used that knowledge since in practice.

8 Q. Do you agree with me that you don't tell us in your 9 witness statement that you didn't know that at the time?

10

16

17

18

19

20

21

11 Can we look at paragraph 28 which follows this paragraph 12 of your witness statement, so over on to page 7 13  $\{HAR00010149/7\}$ . So you say there:

14 "In terms of industry practice, at the time it was 15

generally considered that as long as all of the components, in particular the cladding and insulation, were described as Class 0 in manufacturers' literature and third-party certifications, then this met the requirements of Approved Document B and was therefore compliant. There are many buildings across the UK that have been clad in exactly the same way, as the Government's own figures show."

22 23 Do you see that there?

24

25 Q. You are saying there that was industry practice at the 182

1 time, you say that in the first line; was that your 2

understanding at the time of the Grenfell project? 3 A. No, it wasn't my understanding at the time. I was

4 focused on structural design and fabrication detailing,

5 and this is my take on it, having spoken to other people

6 in the industry and seen what has been put on buildings,

7 you know, in the last ten years.

8 Q. I thought you told us earlier today that you were aware 9 of class 0 at the time.

10 A. Yeah, I was aware of class 0, it was just not in this 11 arrangement. So -- because here I'm saying that -- of

12 what the industry practice was, it's looking backwards.

13 Q. Yes. But was it your understanding at the time that as 14 long as all of the components were described as class 0

15 in manufacturers' literature and third-party

16 certifications, then this met the requirement of

17 Approved Document B and was compliant? Was that your

18 understanding at the time?

19 A. I don't think I had an understanding at the time.

20 I think because I was focused on structural design and

21 fabrication design, I always deferred to the fire

22 consultant for advice.

23 Are you saying that you never applied your mind at all 24 through the Grenfell project to what the classification

25 was of, for example, the insulation?

183

1 A. No, because I wasn't looking at the insulation . I was 2 looking at the structural design of the bracketry and

3 the systems that held it on.

4 Q. So you never thought about that at all?

5 A. No.

6 Q. Okay.

7 So when you talk about industry practice at the 8 time, who exactly are you referring to there? Are you 9 talking about cladding subcontractors, architects, fire 10 engineers, Building Control? Can you help us as to what

11 you mean by that?

12 I'm talking about the whole building industry.

13 Q. Does that mean it incorporates all of the bodies I was 14 just mentioning?

15 A.

16 So cladding subcontractors thought that at the time? O.

17

18 Architects thought that at the time? Q.

19 Yeah. I'm not saying all of them, but a lot of them. A.

20 O.

21 Did you or anyone else at Harley ever challenge that 22 industry practice? Do you remember anyone saying,

184

23 "Well, actually, class 0 is not enough for the

24 components, we need to look deeper than that"?

25 I'm not aware of anyone at Harley doing that, no.

- Q. Now, if we return to that CWCT Technical Note on page 2,
   so this is {CWCT0000019/2}, it goes on on that left -hand
   column, if we look at the bottom of the page, please,
- 4 under "Definitions", it gives definitions of a firestop 5 there:
  - "A seal provided to close an imperfection of fit or design tolerance between elements or components to restrict the passage of fire and smoke."
- 9 Do you see that there?
- 10 A. Yes.

7

8

- 11 Q. Then it talks about the difference between integrity and insulation .
- At the top of the next column, on the right, then we get the definition of a cavity barrier:
- "A construction to close a concealed space againstpenetration or spread of smoke or flame."
- Do you see that there?
- 18 A. Yes.
- 19 Q. Now, were you aware at the time of working on the
- Grenfell project that there was a distinction drawn in
- 21 industry guidance and other practical guidance between
- 22 firestopping and cavity barriers?
- 23 A. I think at that time I was just aware of firebreaks,
- $24\,$  which encompassed both of them, and that you would need
- $25 \hspace{1cm} \text{to put different ones on depending on what you were told} \\$

185

- 1 by the fire consultant.
- $2\,$   $\,$  Q. So if I had asked you at the time: do you know what the
- 3 difference is between a firestop and a cavity barrier,
- 4 what would you have said?
- 5 A. I wouldn't have known the difference between the two.
- 6 Q. Now, moving on to page 4 {CWCT0000019/4} of this
- 7 guidance, under the heading "Cavity barriers in
- 8 rainscreen construction", which is in the bottom
- 9 right-hand column, there we go, there there's
- 10 a paragraph that reads:
- 11 "Fire and smoke spread in rainscreen cavities is
- $12 \hspace{1cm} \hbox{particularly} \hspace{0.2cm} \hbox{dangerous as it} \hspace{0.2cm} \hbox{may be more rapid than on}$
- 13 the outside face of the cladding, due to the creation of
- $14\,$  a flue , and it may be undetected by building users or
- $15 \hspace{1cm} \text{firefighters} \,\, . \ \, \text{It} \,\, \text{ is therefore often necessary to} \,\,$
- 16 incorporate cavity barriers in rainscreen cavities to
- limit the spread of fire and smoke."
- Do you see that there?
- 19 A. Yes
- $20\,$   $\,$  Q. Were you aware at the time that  $\,$  fire  $\,$  and smoke spread in
- 21 rainscreen cavities is particularly dangerous?
- $22\,$   $\,$  A.  $\,$  I  $\,$  was aware that it  $\,$  could spread behind a rainscreen,
- $23 \hspace{1cm} \text{and} \hspace{0.1cm} I \hspace{0.1cm} \text{was} -- \hspace{0.1cm} I \hspace{0.1cm} \text{thought that} \hspace{0.1cm} \text{it} \hspace{0.1cm} \text{just} \hspace{0.1cm} \text{needed to be stopped}$

186

- 24 so that the firefighters could tackle the actual fire.
- 25 Q. What was your understanding as to the role of cavity

- 1 barriers within a rainscreen cavity?
- 2 A. To stop that spread of fire where it could go without
- 3 the firemen being able to see where it was going.
- 4 Q. Was that within the cavity itself in the outside wall,
- 5 or were you also aware that cavity barriers were
  - required to stop the fire breaking out and into the
- 7 rainscreen cavity?
- 8 A. I was aware that they were required. I think from other
- 9 projects, we'd, like I said before, created elevations
- showing where they were going to go, and the fire
- consultant would usually draw on where you needed
- 12 additional ones.
- 13 O. Yes.

6

- 14 A. But I didn't understand where they were required.
- 15 Q. Yes.
- 16 Now, this note goes on to say, under "Regulations",
- there we have it, at the bottom of page 4:
- 18 "For rainscreen walls, ADB requires that cavity
- 19 barriers are provided ..."
- 20 Then if we go over to page 5  $\{CWCT0000019/5\}$ , we see
- 21 there a bullet point at the top that says:
- 22 "To close the edges of cavities including around
- window openings."
- 24 Do you see that there?
- 25 A. Yes.

- 1 Q. Were you aware at the time that there was specific
- 2 industry guidance that emphasised the importance of
- 3 closing the edges of cavities, including around window
- 4 openings?
- 5 A. No.
- 6 Q. Did you know in general terms that window openings had
- 7 to be protected in terms of the spread of fire on your
- 8 projects?
- 9 A. No.
- 10 Q. Then we can see at page 6 {CWCT0000019/6}, if we go to
- $11 \hspace{1cm} page \ 6 \ and \ look \ under \ the \ heading \ "Use \ of \ combustible$
- material" on that left -hand column, we see in the second paragraph it says:
- paragraph it says:

  14 "To satisfy the
- "To satisfy the recommendations in AD B, insulation
  and filler materials in walls of a building with a floor
- $16 \hspace{1cm} \text{more than 18m above ground level are required to be of} \\$
- 17 limited combustibility."
- Do you see that there?
- 19 A. Yes
- $20\,$   $\,$  Q.  $\,$  Just to be clear, you weren't aware of that guidance at
- 21 the time of the Grenfell project; is that right?
- 22 A. No, because I was focused on structural design, and
- $23 \hspace{1cm} \text{these things} \hspace{0.1cm} I \hspace{0.1cm} \text{would always pass on to} \hspace{0.1cm} \text{the} \hspace{0.1cm} \text{fire}$
- 24 consultant because I wasn't trained in it.
- 25 Q. The guidance further down that column, if we look at the 188

bottom of that page, if we look at the paragraph that's
 just above the heading "Alternative approaches", it says
 there:

"The only commonly used insulation material that will satisfy the definition of limited combustibility is mineral wool."

Do you see that there?

8 A. Yes.

4

5

6

7

- 9 Q. Again, were you aware at the time of the Grenfell
  10 project that the only commonly used insulation which
  11 satisfied the definition of limited combustibility was
- 12 mineral wool?
- 13 A. No.
- $14\,$  Q. Were you aware in general terms that mineral wool was
- the safest type of insulation to use in terms of fire
- 16 performance?
- 17 A. I can remember at the time there was lots of talk about
- $18 \hspace{1cm} \text{other insulations, but I didn't aware -- wasn't aware} \\$
- 19 that -- and that they weren't approved for over
- 20 18 metres, but I didn't realise that mineral wool was
- 21 the only one that was.
- $22\,$   $\,$  Q.  $\,$  So you remember at the time there was lots of talk about
- $23\,$  other insulations , and that they weren't approved for
- 24 over 18 metres. Can you remember what kind of
- insulations you are talking about there?

189

- 1 A. No. I just remember that it was always something that 2 you needed to get signed off by the fire consultant.
- 3 Q. I see.

4

5

6

7

8

9

10

11

12

13

14

Now, can I ask you to look again at page 6 of this guidance, and at the bottom is the heading "Alternative approaches", and then at the top of the right-hand column, if we go back to the top of the page, it says

"Where testing is carried out in accordance with BS 8414, the test applies to the complete cladding system including insulation, rainscreen, flashings and cavity barriers. Changing any of these components may affect the ability of the wall to resist the spread of fire."

Now, is that something that you were generally aware of at the time?

- 17 A. No, I wasn't aware that you had to do a -- yeah,
- I wasn't aware of that.
- Q. So you weren't aware that the test would apply only tothe complete system, including all those details that
- were tested, and that changing any of that system might
- affect the ability of the wall to resist the spread of
- fire? You were not aware of that?
- 24 A. I don't think I was even aware there was a test. On
- 25 other projects, I'd always just submit the drawings and

- the material datasheets to the fire consultant for approval.
- 3 Q. But we looked earlier, and we will come back to it
- 4 again, at the email you sent to Mr Roome in 2015 where 5 you're asking about the BS 8414 test. So when you say,
- 6 "I wasn't aware there was even a test", can you explain
- 7 that?
- 8 A. It was just something so outside of what I did in
- 9 structural engineering that if it was requested by
- 10 a client or fire consultant, you pretty much copy and
- pasted what they were asking for because they knew what
- they were asking for.
- Q. So you weren't aware, even in general terms, that there was something that was a system test for fire?
- 15 A. It's hard to separate out what I know now, having done the degree and practised it, between what I knew then.
- 17 Q. Okay.

21

22

23

24

25

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

Can we look at paragraph 30 of your witness
statement, this is {HAR00010149/7}. You're asked the
question:

"To the extent that it was compliant with such regulations, legislation, British Standards, guidance etc. were any of those inadequate and if so in what respects, so far as relevant to the nature and immediate causes of the fire and its spread?"

191

Then you say this:

"With hindsight I believe that the guidance and the legislation is absolutely not adequate. As far as I am aware there was no guidance from any official bodies such as the Centre for Window and Cladding Technology (CWCT) and the Society of Façade Engineers (SFE) that these materials should be avoided. It is still impossible for either the CWCT or the SFE to offer any guidance as the Government has still not made the necessary changes."

Now, focusing on that first part, you say, "As far as I am aware there was no guidance from any official bodies such as the CWCT", but do you agree, given what we've just looked at, that guidance was available from the CWCT regarding the risks associated with combustible materials, including PIR, polyisocyanurate, insulation?

- A. Yeah. What I mean is that they just should not be
  allowed. Anything, you know, with a B rating or worse
  just should not be allowed over 18 metres.
- Q. They should have been banned, is that what you'resaying?
- 22 A. Yeah
- Q. But would you agree with me that there was guidance
   warning about the risks associated with combustible
- 25 material, including PIR insulation?

- 1 A. I just don't think it was -- looking back on it now,
- 2 I don't believe it was strong enough. I think the
- 3 guidance, you know, allowed for a way to -- you know,
- for it to be signed off or approved, and I just don't --
- 5 looking at it now, with the experience that I have and
- 6 the education I have, I don't think that it should be
- 7 put on buildings.
- 8 Q. Just to be clear, I think you have said you didn't read
- 9 the CWCT guidance from March 2011; is that correct?
- 10 A. Back then, no, I hadn't read it.
- 11 Q. And you didn't read the Building Control Alliance
- guidance in June 2014 or June 2015?
- 13 A. No.
- Q. Can you help us as to why you weren't aware of that CWCT
- guidance when Harley was a member of the CWCT?
- 16 A. For me, I was looking at structural design and not
- façade design, so I wouldn't have been sent these sort
- of things. They weren't circulated, as far as I'm
- aware. They would have come in to Graham Hackley or
- 20 Mark Stapley.
- 21 Q. We will see later, and I'll take you through it in
- detail, that you had a lot of dealings with Celotex
- during the project. Why were you having those dealings
- 24 with Celotex if none of this was part of your remit and
- 25 it was all Mark Stapley and Graham Hackley's remit?

- 1 A. Because in the Celotex's rep's previous role, he had
- 2 been dealing with me on structural issues with the
- 3 company that he had worked with before and we had formed
- 4 a relationship, so he used to come in and sit down and
- 5 talk about things. But generally I didn't have the
- 6 background or the training to talk about fire-related
- 7 matters or anything else to do with façade engineering
- 8 apart from the structural side at that point. So, as
- 9 with the other things, I would pass anything that
- I didn't know about through to, you know, the relevant
- consultants who did.
- ti consultants who did.
- $12\,$   $\,$  Q.  $\,$  Graham Hackley had left Harley by the time of the
- Grenfell project, hadn't he?
- 14 A. Yeah.
- 15 Q. So in terms of Mark Stapley, we aren't aware of any
- communications where you say to Mark Stapley, "I don't
- 17 have this experience, I don't have this expertise on
- fire , please can you help me". We don't see that, do
- we, in your email communications?
- 20 A. No.
- 21 Q. Do you recall ever sending such emails to Mr Stapley?
- $22\,$   $\,$  A. No, but they were fully aware of what my area of
- expertise were.
- 24 Q. I see.
- Now, I want to ask you briefly about Harley's

194

contractual duties on the Grenfell Tower project, just briefly .

3 Did you yourself read the letter of intent and

- 4 appendices that were sent to Harley by Rydon and which
- 5 formed part of the relationship between the two
- 6 companies?
- 7 A. No.
- 8 Q. As design manager, was it important for you to
- 9 understand the nature of your contractual
- 10 responsibilities to ensure that Harley's work complied
- 11 with them?
- $12\,$   $\,$  A. My responsibilities as design manager were to make sure
- 13 that the designers were working to programme, and so the
- parts that would have been relevant would have been the
- programme. I wouldn't have read the contract.
- 16 Q. Did you understand that Harley was responsibility for
- ensuring that the design of the façade was compliant
- with the relevant compliances and statutory
- 19 requirements, which would include the
- 20 Building Regulations?
- 21 A. No, I didn't.
- 22 Q. Does that mean you positively thought it was somebody
- else's responsibility, not Harley's, to be ensuring
- compliance of the façade design with the
- 25 Building Regulations?

195

- 1 A. I think my understanding at the time on all projects was
- 2 that it wasn't Harley's responsibility, that you put
- 3 forward your designs to the design team and
- 4 Building Control, who would check it and confirm whether
- 5 it was compliant or not.
- $\ensuremath{\mathsf{G}}$  Q. Did you ever check that assumption with anybody? Did
- you ever say, "Can I just check, are we responsible for
- 8 making sure this complies with the
- 9 Building Regulations"?
- 10 A. Never checked that, but I did -- on other projects that
  - I worked on, I would check that it had been approved.
- 12 Q. Were you aware that some of the subcontract conditions
- that were imposed in the contract with Rydon required
- 14 Harley to notify Rydon if there were any discrepancies
- between the design of the work shown in the employer's
- requirements and the statutory requirements, including
- in the Building Regulations?
- 18 A. No, I wasn't aware of that.
- 19 Q. Were you aware that, as the specialist subcontractor,
- $20\,$   $\,$  you ought to  $\,$  warn either the main contractor or the lead
- designer, Studio E, if there was a deficiency in the
- design in terms of compliance with the
- 23 Building Regulations?
- 24 A. No, I wasn't aware of that.
- Q. Were you aware that it was part of Harley's role to

196

- 1 check whether the products that had been proposed in the
- 2 employer's requirements, including the
- 3 NBS specification, were compliant with the
- 4 Building Regulations and associated guidance?
- 5 A. No, I wasn't aware of that.
- 6 Q. Were you ever made aware of any concerns at the time
- 7 being raised about whether the design was compliant with
- 8 the relevant regulatory requirements, including the
- 9 Building Regulations?
- 10 A. No, I wasn't.
- 11 Q. Did you understand that the conditions that were imposed
- $12 \hspace{1cm} \hbox{by Rydon on Harley included a \ liability \ for \ design work} \\$
- to the standard of an architect or other appropriate
- professional designer holding themselves out as
- competent to do the work?
- 16 A. Sorry, I don't understand the question.
- 17 Q. Sorry, it was a long question.
- Did you understand that the conditions that were
- imposed by Rydon on Harley included a liability for
- design work to the standard of an architect or other
- 21 appropriate professional designer holding themselves out
- as competent to do the work?
- 23 A. Sorry, can you summarise that in a way that --
- 24 I literally --
- 25 Q. Were you aware that Harley's work had to meet the

- 1 standard of an architect's work in terms of the façade
- 2 design?
- 3 A. No. I wasn't.
- 4 Q. Or had to meet the standard of another appropriate
- 5 professional designer holding themselves out as
- 6 competent to do the façade design?
- 7 A. No.
- 8 Q. Did you understand that the provisions of the main
- 9 contract between the TMO and Rydon were incorporated
- 10 into Harley's subcontract insofar as they related to the
- design of the façade?
- 12 A. No.
- $13\,$   $\,$  Q.  $\,$  Did you understand that the intention of the subcontract
- was that Harley should take on the design
- responsibilities in relation to the external cladding
- works that Rydon had undertaken to the TMO under the
- design and build contract?
- 18 A. Sorry, that's another long one.
- 19 Q. Yes, sorry.
- 20 Did you understand that the intention of the
- 21 subcontract was that Harley would take on the design
- 22 responsibilities in relation to the external cladding
- work that Rydon had undertaken to the TMO? So in
- $24\,$  effect , did you understand that you were sitting in
- 25 Rydon's shoes so far as it concerned the design of the

198

- 1 cladding and the external wall?
- 2 A. No.
- 3 Q. Did you ever take the opportunity to inspect the main
- 4 Rydon building contract?
- 5 A. No
- 6 Q. Now, we know that this was a JCT design and build
- 7 contract, that's Rydon's contract was design and build.
- 8 How familiar were you with design and build projects?
- 9 A. From a contracts point of view or in general?
- $10\,$   $\,$  Q. From a projects point of view. How many of the projects
- that you'd been involved in were design and build?
- $12\,$  A. I think, for my part, I never had any dealings with
- contract at all, and so probably at that point in my
- career wouldn't have been aware of what contracts were
- design and build or weren't design and build.
- 16 Q. You wouldn't have been aware of what was meant by design
- 17 and build?
- 18 A. I don't think so, no.
- 19 Q. Did you understand at the time you were working for
- Harley on the project that the architect and other
- design consultants were not retained by the TMO through
- to completion of the construction and handover of the
- 23 building?
- 24 A. No.
- 25 Q. Did you understand that Rydon had taken on

199

- 1 responsibility for the entire design and construction of
- 2 the works?
- 3 A. No.
- 4 Q. Did you understand that because Rydon would not have
- 5 itself expertise to design and construct every element
  - of the works, it would appoint specialist subcontractors
- 7 for particular elements?
- 8 A. No.

6

- 9 O. And that those subcontractors would be liable for the
- design and construction of that particular element of
- 11 the works, did you understand that?
- 12 A. No
- Q. Were you aware whether Rydon had in place a process to
- supervise the quality of the work that Harley was doing
- on the project?
- 16 A. Quality of the install or quality of the design or
- 17 everything?
- 18 Q. Quality of the design, really, is what I'm thinking of.
- 19 A. My understanding at that point would have been that they
- would pass the information that we sent them through to
- 21 their design team to approve, and that would have been
- how they maintained the quality.
- 23 Q. I see. So you weren't ever made aware of Rydon
- 24 independently checking or --
- 25 A. No.

- 1 Q. -- looking at the design?
- 2 A. No.
- 3 Q. Was it your understanding that Harley's subcontract with
- 4 Rydon required it to consider the NBS specification,
- 5 which had been part of the employer's requirements?
- 6 A. I wouldn't have known that that was in the contract, but
- 7 I knew that it was -- on every job we're given the
- 8 specification . I knew that on this job it was an NBS
- 9 specification.
- 10 Q. We will come and look at the NBS specification later,
- but were you aware in general terms that there was
- 12 something called the NBS specification on this project,
- the Grenfell project?
- 14 A. Yes.
- 15 Q. Were you aware that Harley's work had to comply with
- a specification produced by Curtins Consulting, which
- was entitled "Structural performance specification for
- the design, supply and application of overcladding
- 19 systems to Grenfell Tower"?
- $2\,0\,$   $\,$  A. No, I thought the only one we had to comply with was the
- NBS specification.
- 22 Q. Can we just look at that Curtins Consulting document,
- 23 {ART00000914}. So does this help in any way? You
- didn't think you had seen this specification. Now you
- 25 can see this front page, does that trigger any

- 1 recollection of seeing this at the time?
- 2 A. No, I can't remember ever seeing this before.
- 3 Q. I just want to have a look at a couple of items in here.
- 4 If we go to section 6 on page 9 {ART00000914/9}, we can
- 5 see that the contractor is expressly required to
- 6 consider, and then just at the bottom of that page, can
- you see three items up it says, "The need for effective
- 8 fire barriers". Do you see that there?
- 9 A. Yes.
- 10 Q. Were you aware that that was part of Harley's
- 11 responsibility to consider the need for effective
- 12 fire barriers?
- 13 A. We would have known that we needed to put fire barriers
- $14 \hspace{1cm} \text{in, we just wouldn't have known necessarily where they} \\$
- 15 needed to go. We've relied on the fire consultant to
- tell us, as with other projects I had worked on.
- 17 Q. If we look on at page 11 {ART00000914/11} of this
- specification, at item 7.1.13, we see there it says this:
- 20 "The system should comply fully with the
- 21 recommendations of the BRE document 'Fire Performance of

202

- 22 External Thermal Insulation for Walls of Multi Storey
- Buildings', second edition, 2003."
- Do you see that there?
- 25 A. Yes.

- 1 Q. And also it says in the paragraph below that, 7.1.14:
- 2 "The system shall not be a fire risk at any stage of
- 3 installation, nor shall it constitute a fire hazard
- 4 after completion if for any reason the insulant becomes exposed."
- 6 Do you see that there?
- 7 A. Yes.
- 8 Q. Now, looking back at 7.1.13 and that BRE document, were
- 9 you familiar at the time with that BRE publication,
- 10 BR 135?
- 11 A. No.
- $12\,$  Q. Let's just turn to that. This is at {BRE00005554/2}, we
- 13 see the front page of it. This is the second edition of
- that document. It was dated 2003.
- Again, just by looking at that, can you recollect
- whether you ever saw that at the time of the Grenfell
- 17 project?
- $18\,$   $\,$  A. No, I only became aware of this document when I went to
- 19 Bath for the MSc.
- 20 Q. So you wouldn't have been aware of any of the guidance
- in this document about the risks posed by external
- thermal insulation in walls in multistorey buildings?
- 23 A. No, I wasn't taught it until I'd left the company.
- 24 MS GRANGE: Can we just look at a couple of bits of this
- 25 guidance.

3

203

- 1 Mr Chairman, I would quite like just to finish this
- 2 topic, if that's okay. I can do that within the next
  - five minutes
- 4 SIR MARTIN MOORE-BICK: Well, if you can do it within
- 5 five minutes, of course, that's fine.
- 6 MS GRANGE: Thank you.
- 7 On page 7 {BRE00005554/7} there is a reference to
- 8 and a picture from the Garnock Court fire in Irvine,
- 9 which is a fire in a multistorey building. You can see
- $10\,$   $\,$  there is a discussion of that there, and then there is
- a picture below that.
- Do you ever remember seeing anything about the
- $13 \qquad \quad \text{Garnock Court fire in Irvine at the time of the Grenfell} \\$
- 14 project?
- 15 A. No, I don't.16 O. Can I look at pages 17 {BRE}
- 16 Q. Can I look at pages 17 {BRE00005554/17} and 18
  17 {BRE00005554/18}, under the heading at the bottom of 17
- 18 "External panel", "Non-combustible materials and
- LX External panel , Non-compustible materials and
- materials of limited combustibility", do you see that
- 20 there.
- 21 A. Yes
- $22\,$  Q. If we go over to the top of page 18, if we pick up three
- 23 lines down, so this is talking about metal panels, it

- 24 says:
- 25 "They may also generate large pieces of falling

1 1 debris if the integrity of the fixings to the railing at this time, some of which contain insulation 2 2 systems is lost during the fire. Metal panels such as materials, that could have those characteristics in 3 aluminium may fall from the system if the strength of 3 terms of generating falling debris, adding to the fire 4 4 the fixings is affected by the local fire source. They load and providing a route for fire spread up the 5 may also melt, generating molten metal debris if exposed 5 outside of the building? Were you aware of that? 6 6 directly to the sustained flame envelope." A. No, the only thing I was aware of is that they would 7 7 Do you see that there? 8 8 A. Yes. Q. Would you agree with me now, looking at that, that this 9 9 Q. Now, you say you didn't see this guidance and you paragraph appears to be warning about precisely the kind 10 10 weren't aware of it; were you aware in general terms of of products like ACM that are combustible, that might 11 those kind of phenomenon in terms of metal panels such 11 generate falling debris, add to the overall fire load, 12 as aluminium? Were you aware of this, melting, 12 and lead to the propagation of fire up the external 13 13 "generating molten metal debris if exposed directly to envelope of the building? 14 the sustained flame envelope"? Were you aware of that 14 A. Yes. 15 15 MS GRANGE: Mr Chairman, that's a good moment to stop. in general terms? 16 A. Yeah, from doing the structural degree I was aware that 16 SIR MARTIN MOORE-BICK: It's very good timing, well done. 17 aluminium has a much lower melting temperature than 17 Thank you. 18 steel, and with the temperatures created in a fire, 18 Mr Anketell-Jones, that's enough for one day, 19 19 aluminium will melt. I think. We will break there. I will have to ask you 20 20 Now, the version of this document that was closest in to come back for some more questions tomorrow, please. 21 time to the Grenfell fire is the 2013, the third edition 21 So we'll resume at 10 o'clock tomorrow, and please 22 22 of BR 135. If we can pull this up at {CEL00003364}. remember what I said to you earlier: it's very important 23 23 Again, there is the front page. It's the third edition, that you don't discuss your evidence or anything related 2.4 24 it was dated 2013, and it was by Sarah Colwell and to it while you're out of the room. All right? 25 25 Tony Baker. THE WITNESS: Yes, sir. 205 207 1 Does that front page help in terms of whether you 1 SIR MARTIN MOORE-BICK: If you would like to go with the 2 saw this version, the third edition, at the time of the 2 usher, we will see you at 10 o'clock tomorrow. 3 3 Grenfell project? Thank you. THE WITNESS: Thank you. 4 4 A. I recognise it now, but I don't believe I saw it then. 5 Q. I want to have a look at page 22 {CEL00003364/22}, at 5 (Pause) 6 6 just one piece of this at the moment, at SIR MARTIN MOORE-BICK: Good. Thank you, 10 o'clock 7 7 paragraph 6.4.1, page 22, the last paragraph on the tomorrow. 8 8 right-hand side there, and it begins, "Combustible MS GRANGE: Thanks. 9 panels are typically ", and it's immediately before 9 (4.30 pm) 10 6.4.2. It says: 10 (The hearing adjourned until 10 am 11 11 "Combustible panels are typically based on vinyl or on Tuesday, 15 September 2020) 12 glass-reinforced plastic, although various new products 12 13 are being developed in this area, some of which also 13 14 contain insulation materials. These products generally 14 15 15 have good surface spread of flame characteristics to 16 prevent rapid fire spread across the surface of the 16

206 208

17

18 19

20

21

22

23

24

25

A. Yes.

system, but once the panels become involved in the fire,

they have the potential to generate falling debris, add

to the overall fire load, and provide a route for fire

Q. Again, I know you say you didn't see this at the time,

but were you aware in general terms that there were

various new combustible panel products being developed

to propagate up the outside of the building."

Do you see that there?

17

18

19

20

21

22

23

24

1	
2	INDEX
3	MR MIKE ALBISTON (affirmed)1
4	Questions from COUNSEL TO THE INQUIRY1
5	MR DANIEL ANKETELL-JONES (affirmed)108
6	Questions from COUNSEL TO THE INQUIRY108
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	
21	
22	
23	
24	
25	
	209

Opus 2 International Official Court Reporters

a7 (1) 167:19 ability (3) 75:13 190:13,22 able (17) 8:2,9 17:1,7 25:14 27:20 42:8 81:6 104:2 119:8 127:9 153:18 157:4 158:6 176:24 177:11 187:3 above (11) 22:21 41:6 52:24 158:3,5 159:17 162:5 164:1 171:16 188:16 189:2 abreast (2) 10:9,11 abseil (1) 147:23 absolutely (3) 35:14 64:4 192:3 academic (1) 116:24 accept (3) 62:10 67:25 89:11 acceptable (2) 163:22 171:18 acceptance (1) 164:4 accepted (4) 84:20 167:20 168:1 176:16 access (3) 4:20 137:23 178:16 accord (1) 55:14 accordance (4) 58:24 169-2 180-20 190-9 according (3) 164:4,13 171:20 accordingly (1) 138:4 account (2) 30:24 72:14 accounts (1) 72:3 accredited (1) 171:24 accurate (4) 13:25 73:11 81:20 142:20 accurately (2) 8:9 63:20 achievable (1) 31:17 achieved (1) 121:22 achieves (1) 86:12 acm (47) 7:5 20:22 21.6 8 17 19 24.21 25 33:14,19 34:13,18 42:4 43:11 44:24 48:2,5,9,23,24 49:12,23 50:7 53:8,17,19 54:1,4,11,13 55:12 61:25 62:7 68:4 69:3.5.10 74:7.15 79:19.24 82:15.19 84:17 149:24 150:2 207:10 acoustics (4) 116:15 117:12,24 182:5 across (4) 127:9 167:1 182:20 206:16 acted (1) 125:12 actual (12) 20:15 71:24 73:14 77:17,21,25 82:20,22 100:25 102:14 136:8 186:24 actually (56) 6:2 7:5 10:13.21 14:21.22 15:9 17:11 19:10 20:10.14 22:23 26:15 28:4.7 29:7 32:14.18 34:3,4,7 35:12 41:9 44:1 47:2.2 48:17

61:5 64:15 66:4 67:4 68:17.25 70:10 73:15 77:7 84:2 85:14 86:21 92:11 93:15 95:16 100:22 101:6 102:5 104:18 106:18 128:5 132:19 139:9 173:10 182:7 184:23 ad (7) 163:24 167:19,20 169:3 180:15 187:18 188-14 adb (6) 69:6 165:7 168:1 170:24 176:14,17 add (4) 30:19 169:15 206:18 207:11 added (3) 83:12,15,16 adding (2) 83:12 207:3 addition (2) 38:2,10 additional (6) 57:12 81:22 83:1 108:16 169:16 187:12 addon (1) 78:9 addressed (1) 52:21 addressing (1) 98:10 adequacy (1) 132:25 adequate (2) 119:9 192:3 adequately (2) 154:4 155:9 adjourn (1) 107:24 adjourned (1) 208:10 adjournment (1) 108:4 adopting (1) 173:16 advice (3) 98:5 152:2 183:22 advise (2) 119:5,8 advisory (1) 163:13 affect (4) 87:22 88:11 190:13,22 affected (1) 205:4 affirmed (4) 1:12 108:11 209:3,5 afraid (16) 16:25 23:21 34:15 55:19 61:19,23 92:5,13 96:6 97:1 99:10 100:12.15 101:15,17 145:17 after (24) 6:4 19:7 24:17 34:7 52:18 63:2 66:3 67:1,4 79:18 93:5 94:17 97:4 107:21 111:6 116:18 126:11,16 145:22 147:25 149:6,10 170:4 203.4 afternoon (3) 86:10 108:7,15 again (63) 1:21 12:6 16:10 20:9 21:15,24 22:1 23:1 24:2 27:3.5 29:9 31:24 32:17 34:3.5 35:14.16 41:11 42:17 43:16 44:5,10,15 52:2 55:21 56:4 67:22 68:25,25 69:25 77:19

161:24 164:8 166:11 167:4.23 189:9 190:4 191:4 203:15 205:23 206:23 against (5) 56:20 72:11 76:5 94:9 185:15 ago (7) 42:15 71:19 72:18 101:17,20 76:21 140:23 165:8 agree (10) 8:12 25:12 83:5 120:23 125:19 142:22 182:8 192:13.23 207:8 agreed (5) 57:8 64:25 65:25 137:15,22 ah (1) 95:18 aim (2) 8:13 61:24 aiming (1) 24:21 albiston (24) 1:10,11,12,13,17 4:15,17 15:17 16:5 19:17 26:10 62:20 63:12,25 64:8 67:1 68:9 105:2,9 106:2,4 107:12.17 209:3 album (1) 84:1 alcoa (7) 16:20 43:15 74:24 76:2,12 209:5 99:18,21 alcoas (1) 76:6 ali (1) 87:9 alliance (6) 36:9 160:21.23 164:10 170:18 193:11 alliances (1) 173:22 174:14 allowance (1) 17:17 allowed (4) 174:2 192:18,19 193:3 almost (1) 136:24 along (2) 107:17 164:10 already (8) 15:10 24:14 26:25 31:4 52:7 55:11 59:5 151:18 also (34) 1:23,25 3:18 7:18 8:14.17 19:17 30:20 33:22 36:6 39:8 51:15.16 54:25 71:1 83:21 84:4 98:16 110:8 120:19 128:14 134:24 146:6 165:14 173:24 180:19,22 181:15 182:6 187:5 203:1 204:25 205:5 206:13 alternative (22) 8:19 9.13 16 17 31.15 38.5 40:5,20 48:24 50:14 55:16 61:22 62:8.13.15 68:15 69:3,10 71:9 171:18 189:2 190:5 alternatives (14) 38:6.20.23 39:9 40:22 50:8 53:14 59:14 60:4,8,12 61:17 70:2 89:7 although (11) 17:1 19:21 31:14 33:12 60:17 61:16 65:1 68:3 77:1 95:15 206:12

38:7 39:9 46:18,19 50:13 52:9.12 54:22,25 55:3,6,13,18 56:3 60:12.14.23.23 61:5.8.13 62:9.10 69:24 70:10 71:4,8,8,14,16 75:3,14 aluminium (16) 7:6 18:7 30:7,11 53:2 72:8 74:8 84:3.3.7.19 88:23 205:3,12,17,19 always (8) 122:6 151:3 152:2 157:21 183:21 188:23 190:1,25 among (1) 78:17 amount (3) 12:13 133:17 146:24 analysis (4) 57:13,17 142:16.23 anketelljones (23) 25:23.25 31:25 32:6.9 33:2 35:17 41:9 87:7 96:10 98:23 108:9.11.13.21 117:15 139:11 141:6 169:21 170:16 177:19 207:18 another (7) 22:8 34:14 56:17 145:3 155:11 198-4 18 answer (12) 2:2 8:24 63:23 64:1.3.10 68:22 98:2 106:5.13 119:22 answering (1) 181:23 anticipate (1) 65:8 anybody (16) 41:14 65:17,20,20 66:7 67:14 68:23 69:5,11 71:21 87:20 99:6 110:18 149:5 152:16 anymore (1) 93:16 anyone (18) 31:23 54:16 62:24 88:4 90:20 92:20 105:17 130:11 149:9,19 157:10 169:25 172:13 173:16.18 184:21,22,25 anything (18) 25:18,18 32:7 62:24 75:15.17 108:24 117:2 121:19 147:7,15 148:22 169-25 192-18 194-7 9 204:12 207:23 anyway (6) 12:2 48:17 55:7,17 78:1 93:16 anywhere (1) 89:18 apart (1) 194:8 appeal (1) 84:4 appear (1) 109:10 appeared (1) 142:25 appears (4) 51:20 104:10 177:24 207:9 appendices (1) 195:4 applicable (1) 159:2 application (3) 32:10 33.1 201.18 applied (3) 39:8 59:15 183:23

apply (8) 12:4 40:8 41:11 56:5 150:19 168:10,16 190:19 appoint (2) 129:13 200:6 appointed (4) 65:7 66:4 126:16,18 **appointing (1)** 128:15 appointment (2) 128:19 130:9 appreciate (1) 160:7 appreciated (1) 108:23 appreciating (1) 179:22 approach (5) 47:4,15 55:23 157:25 171:18 approached (3) 46:11 62:5,9 approaches (2) 189:2 190:6 approaching (2) 28:1 appropriate (5) 76:11 169:18 197:13,21 198:4 appropriately (1) 25:13 approval (5) 65:3,10 104:19 171:8 191:2 approvals (1) 132:2 approve (2) 169:15 200:21 approved (26) 23:10 66:2,8 69:6,12 119:12 122:19.22 151:16 154:6,7,10 161:15 163:2,21 174:1,19,24 181:10.12 182:19 183:17 189:19,23 193:4 196:11 approx (1) 23:10 approximately (1) 100:6 april (13) 43:19 44:22 74:19 75:21 77:7 78:13,16 79:13 86:6,19 161:22 162:2 170:19 architect (16) 3:17 7:18 39:4 43:18 65:1.15 67:23 77:24 78:4,6 85:2 104:20 112:4 197:13.20 199:20 architects (15) 11:11 19:3 31:16 43:16 65:3.4.25 79:20 98:5 99:16 114:14 131:18 184:9,18 198:1 architectural (1) 37:21 arconic (3) 152:5,8,17 area (8) 98:3 100:21 101:2 102:9 125:24 163:25 194:22 206:13 areas (4) 29:20 66:23 71:24 73:14 arent (2) 105:11 194:15 arises (1) 106:4 arithmetic (1) 101:14 arose (1) 130:23 around (14) 16:2 40:6 81:22 85:11 93:9 113:17 128:11 149:6 158.3 169.4 9 177.24 187:22 188:3 arrange (2) 140:7,8 arranged (3) 139:14,19

19:7.12 72:9.22 art0000091411 (1) 202:17 art0000208744 (1) 141:4 arthur (2) 6:22 7:2 78:11 89:11 207:19 asking (14) 26:6 106:6 108:25 aspect (1) 151:7 aspects (2) 131:17 133:6 126:6 127:4 171:20 assessment (3) 69:4.11.12 79:4 119:17 assisted (1) 57:11 197.4 associations (2) 123:20 124:3 assume (2) 53:18,22 assumed (4) 48:22 133:16 140:4 166:19 assuming (1) 101:13 assumption (4) 61:9 139:2,3 196:6 assumptions (3) 150:7,10,11 assurances (1) 168:13

astralite (7)

33.15

5:12,14,19,22,24 6:7

attach (5) 27:14 57:24

78:17,22 81:16

attached (11) 27:12

51:13 66:14,18 68:3 arrangement (1) 183:11 arrived (7) 6:10 18:4,17 art00000914 (1) 201:23 art000009149 (1) 202:4 ask (37) 1:21,23 5:3 15:2 16:10 17:25 18:22 21:2 28:6 35:18 43:6 46:2 55:3,10 56:12 57:21 61:5 63:12 67:14 77:6 91:4.11.23 97:18 98:9 109:1 120:21.23 139:18 144:19 149:23 176:11 190:4 194:25 asked (19) 11:1 22:18 41:4 55:18.25 63:15 67:10,16 68:12 73:18 105:12 120:14 121:1 151:1 155:13 176:23 178:19 186:2 191:19 68:20,24 72:22 102:2 120:17.19 121:7 181:23 191:5,11,12 assembled (1) 84:17 assembly (1) 168:20 assess (4) 42:8 125:17 assessed (6) 13:22 25:8 164:4,13 166:15 assessing (2) 9:17 31:20 assessments (2) 69:13 assist (3) 9:24 115:3 assisting (1) 107:14 associated (5) 9:19 133:12 192:15,24 205.10 10 12 14 16

69:17 74:12 78:20 84:16 138:13 162:4 attaches (1) 46:9 attachment (3) 67:18 82:9 162:9 attachments (1) 36:18 attended (1) 15:14 attending (5) 1:18 108:22 116:7 123:15 178.3 attention (2) 169:8 180:2 august (4) 92:25 93:9,14,15 author (1) 146:22 authority (1) 140:9 authorship (1) 63:17 automated (1) 111:3 available (5) 17:4 24:24 68:4 173:23 192:14 avoided (1) 192:7 awarded (1) 57:11 aware (136) 14:21 18:18 24:24 34:17 21 44:22 45:1,20 49:15 74:14.17 87:18.24 92:25 93:4,6,7 99:8 118:16,22 123:7 129:23,24 138:9 140:20 145:13 147:10.14 149:1.20.21.22.24 150:2.4.16 153:5,8,10,13,16,21,24,25 156:4.7.10.23 157:2.5 158:2 159:10,24 160:12,24 164:8,13 165:18 166:11 167:7,7,23 168:4,19 169:7.11 171:3.6.9 172:3,6,17,18 174:22 175:12 176:12,16,20 178:15 179:5,7 181:3 183:8,10 184:25 185:19,23 186:20,22 187:5.8 188:1.20 189:9,14,18,18 190:15,17,18,19,23,24 191:6.13 192:4.12 193:14,19 194:15,22 196:12,18,19,24,25 197:5.6.25 199:14.16 200:13,23 201:11,15 202:10 203:18,20

В

206:24 207:5,6

away (2) 74:25 134:15

**b (24)** 35:24 69:6,12 117:10,12,25 119:12 122:19,22 153:21,25 154:6,8,10 174:1,19 180:15 181:10.12 182:19 183:17 187:18 188:14 192:18 **b1 (1)** 153:25 **b2 (5)** 163:21,24 167:19.20 169:3 **b4 (3)** 154:3 155:5,5 **b41 (1)** 155:8 b5 (1) 154:1

50:17 53:19 58:14

85:15,21,23 86:21

89:15 92:8 97:14

130:12 131:16,18

99.4 7 102.9 105.17

106:22 109:23 113:14

140:19 144:13 148:8

alucobond (41)

34:12,13,18,18,22,23

applies (1) 190:10

33:14,17

bachellier (2) 57:23 66:16
back (59) 18:7,12 23:5
25:2 29:10 31:9 34:9
37:24 42:14 51:4 56:19 57:21 58:19
62:22 68:19,24 70:9
72:4 73:18,20 83:12,12,15,16 88:14
89:20,22 94:22 102:16
105:13 120:3,21 121:4
125:1 126:24 128:23 129:9 130:8 140:18
151:4,15 154:23
157:14 159:7 161:2,12,16,24 163:4
169:23 170:21 177:12
181:22 190:7 191:3
193:1,10 203:8 207:20 background (3) 2:25
110:22 194:6
backwards (1) 183:12 bailey (37) 6:15 7:23
9:4 15:14 16:13 18:2
19:16 21:13 25:23
31:14,24 32:1,6,8 33:2 35:16 41:8,20 47:14
57:9 61:21,21 70:1
75:21 83:18 84:25 87:7 90:23 98:22
118:3 125:15 133:9,25
134:1 137:16 144:14
173:9 baileys (1) 139:5
baker (1) 205:25
banned (1) 192:20 barrier (2) 185:14 186:3
barriers (18) 147:16
149:6 165:25 166:4 169:2,9,12,14 185:22
186:7,16 187:1,5,19
190:12 202:8,12,13
base (5) 19:22 20:23 91:7,10 102:14
based (21) 11:9 13:23
20:19 25:9 29:5,19,21 49:11,22 56:9 59:25
60:2 61:10 62:8
71:24,25 72:24 73:14
91:16 137:3 206:11 basic (2) 83:5,14
basically (13) 3:12,20
30:18 41:13 43:1 44:16 48:1 50:4 54:18
113:20 121:3 132:10
141:24
<b>basis (6)</b> 17:8 45:22 59:11 68:2 70:18
138:16
bat (1) 124:16
bath (5) 116:3,7 118:17 159:10 203:19
<b>bba (2)</b> 43:6,8
bca (8) 36:9 160:21,22,25 161:5,22
173:22 175:14
became (2) 179:7
203:18 become (3) 118:22
179:18 206:17
becomes (1) 203:4 becoming (1) 179:19
before (67) 2:21 5:12

6:15,18 7:14 12:24 14:12 15:12 16:8 24:13 27:1 33:13,25 36:3.15 49:16 58:14 59:14 63:14.14 67:19 72:24 73:15,19 88:16 89:15 90:2,3,22 91:25 92:1,3,4,18 93:23 98:9 106:6 110:18 111:21 112:16 114:5 115:16.18.19 125:9 129:16 130:10 134:17 139:1.12 141:8.10 148:24 154:9 158:21 162:23 165:6 166:15 168:9 170:17 179:19,22 182:6 187:9 194:3 202:2 206:9 began (6) 3:1 5:5 13:20,25 25:6 26:6 beginning (7) 5:9,10 64:16 125:22 131:23 155:18 180:8 begins (3) 180:2,11 206.8 behind (2) 128:12 186:22 being (38) 11:1 13:9 16:23 23:1,2 25:24 41:4 44:4,13 45:7 47:9 48:11 50:22 79:12 91:9 92:11 97:11 99:7 114:18.19 120:14 123:23 127:19 129:24 132:20 134:23 137:3 143:15 149:1 156:12 166:15 172:5,18 179:20 187:3 197:7 206:13.25 believe (36) 6:22 7:4 11:21 12:23 16:7 18:24 26:3 28:4.9 43:15 44:3 46:13,19 47:1 48:7,17 63:24 64:13 65:11 68:10 77:12 79:14 82:1 95:9 100:22 102:6 134:19 138:11 143:18 148:3 161:20 177:1,6 192:2 193:2 206:4 believed (2) 74:7 138:20 bell (3) 23:20 43:20 101:14 below (13) 23:9 38:2 53:3 66:21 76:4 94:6 95:17 146:23 163:25 164:24 171:16 203:1 204:11 benefit (2) 163:6,9 benefits (2) 142:12 178:16 beng (1) 111:2 bespoke (4) 111:8,21 113:15 114:13 best (3) 10:7 15:25 76:14 bethel (1) 100:2 better (4) 70:11 82:6 95.21 159.6

71:18 72:14,16,17 73:24 75:24 80:5 94:4 107:7 114:18 126:1 130:20 134:11.25 135:2 136:5.8.18 147:2,12 157:5 172:4 180:24 181:3 185:7,11,21 186:3,5 191:16 195:5 196:15 198:9 beyond (1) 42:3 bid (2) 72:25 73:8 bidding (1) 58:2 big (2) 5:23 111:15 bit (14) 13:16 20:4 21:16 25:3 58:19 81:3,13,21 89:22 112:19 128:1 152:20 164:25 180:10 bits (2) 154:18 203:24 blades (16) 46:6 49:5.19.21.25 50:7,16,21 51:4,19 53:12,16 56:13 60:21 71:21 75:20 blake (1) 66:13 block (4) 6:24 7:2 141:16 142:9 blue (1) 84:1 boards (4) 167:18 176:8.20.24 bodies (5) 123:3 124:11 184:13 192:4.13 body (4) 163:16 164:9 171:24 175:8 booth (2) 33:16 71:2 boss (1) 111:19 both (9) 28:14 60:13 67:21 81:18 88:23 139:12 149:1 163:25 185:24 bottom (39) 11:6 14:11 17:15,16 29:1 49:4 51:2 77:14 80:6,18 94:24 102:25 103:3 109:14,24 130:15 139:8.9 146:4.8 148:13,14 155:19 158:8.25 168:24 170:25 175:23 178:1 180:1,5,7 185:3 186:8 187:17 189:1 190:5 202:6 204:17 bought (1) 5:25 boustead (1) 113:16 box (3) 82:14.19 103:3 br (12) 122:1 156:19 157:1,12 164:13 168:8,17 171:21,25 176:18 203:10 205:22 br135 (1) 164:5 br135bs8414 (1) 168:25 bracketry (1) 184:2 brackets (2) 30:19 176:5 bre (4) 156:17 202:21 203:8.9 bre0000555417 (1) 204:16 bre0000555418 (1) bre000055542 (1)

bre000055547 (1) 204:7 break (14) 62:17.20 63:6 105:13,25 108:14.16 109:3 140:16 147:2 169:19,21 170:10 207:19 breakdown (2) 81:16 82:10 breaking (2) 57:17 187.6 breaks (2) 147:1 148:19 brief (2) 3:10 26:3 briefly (6) 7:22 88:14 120:2 177:3 194:25 195:2 bring (1) 129:11 british (3) 122:3 181:14 191:22 broad (1) 8:8 broader (2) 135:11,14 brochure (3) 78:17,23 97:8 broke (1) 170:17 brought (1) 106:22 bruce (5) 18:1 21:12 22:16 83:20 86:9 bruces (1) 74:23 brushed (5) 76:3 84:3,3,19 87:9 bs (12) 120:18,19,24 121:10.15 156:20 168:17 172:9 176:18 180:20 190:10 191:5 bs3 (2) 159:6.8 bs476 (1) 181:15 budget (16) 15:13 18:6,12,25 19:6,9,11 26:25 27:9 45:5,6,16,21 63:16 86:13.20 budgetary (3) 142:17,23,23 budgeted (1) 45:9 budgets (2) 19:12 64:18 build (11) 21:22 47:22 81:15 198:17 199:6,7,8,11,15,15,17 building (68) 9:18 10:3.16 32:15.22 35:21 36:9 69:8 91:18 99:15 117:3.5 118:1 119:6.10 122:17 127:22 130:22 132:13 133:11,22 152:24 153.6 10 20 22 154.25 155:6,9,11,12,22 159:1,17 160:21,23 162:4 163:15.15.24 164:9,9 165:12 170:17 171:5 173:22 180:4 181:13,25 184:10,12 186:14 188:15 193:11 195:20,25 196:4,9,17,23 197:4,9 199:4,23 204:9 206:20 207:5,13 buildings (15) 36:3 71:5 122:3 149:25 156-1 9 19 158-3 4 161:8 182:20 183:6 193:7 202:23 203:22

built (3) 13:23 25:9 59:20 bullet (5) 38:14 167:15 168:23 176:2 187:21 burn (1) 160:5 business (1) 127:2 buxton (1) 143:8 buy (1) 78:6 C calculated (1) 82:16 calculations (2) 30:13 136:14 call (5) 1:11 25:22 31:3 77:11 130:5 called (11) 6:23 33:16 93:20 102:21 111:8 122:1,19 153:5 159:5 177:16 201:12 camden (2) 67:22 143:6 came (14) 21:2 26:1 34:18,22 42:17 59:17 80:19 83:8.13 85:10 101:8 145:1 150:25 161:17 candidate (1) 79:18 cant (60) 6:25 7:11 18:20 23:21 28:16 29:7 34:4,15 40:25 44.3 48.8 51.6 54:17,23 55:19,21 56:4 61:23 68:25 69:1 73:17 75:15 78:6 81:9 83:9,13 85:14 86:21 92:8.13 97:1 101:16 102:5 103:15,16 104:22 112:18 115:15.20.21 123:9.10.17 133:18 134:19 143:1,18 144:2 145:16.18 146:12 157:9 159:3 162:13,16 164:22 178:11 179.7 17 202.2 capability (1) 54:21 capacity (2) 125:5 134:11 career (3) 151:5 154:22 199:14 carefully (1) 177:13 carried (6) 11:7 147:22 157:6 174:2 175:8 190:9 carry (2) 63:8 170:12 carrying (1) 131:8 cases (2) 163:13 169:3 cassette (26) 16:19 21:19 28:14 45:6.7.8 49:12,22 50:4,23 60:16,18 67:22 74:12 79:25 81:2,19,20,25 82:6 84:19 85:19,24 87:2,12 88:1 cassettefixed (1) 81:10 cassettes (2) 61:13 84:17 cast (1) 127:9 castlemaine (2)

143:8.17

**buildup (3)** 29:11 78:5

catch (1) 167:13

caused (1) 14:24

categorically (1) 64:4

causes (1) 191:25 cautious (1) 156:11 cavities (8) 155:25 156:8 165:3 186:11.16.21 187:22 188:3 cavity (22) 147:16 149:6 165:14,25 166:4 169:1,2,9,11,14 185:14,22 186:3.7.16.25 187:1,4,5,7,18 190:12 cel00000018 (1) 96:7 cel000000192 (1) 120:5 cel00000452 (1) 94:16 cel000004521 (1) 94:22 cel000004522 (1) 94:20 cel00002347 (1) 175:17 cel00003364 (1) 205:22 cel0000336422 (1) 206:5 cel00003628 (1) 161:24 cel00009876 (1) 177:10 cel00009973 (1) 93:19 cel000099732 (1) 94:2 celotex (34) 34:2 42:4 88:22 90:13.15 91:1,3,22,23 92:24 93:20 94:1,4,17 95:13 96:1,11 99:22 102:11 106:6.14.19 120:10 121:8 161:23.25 164:20.21 177:14 178:6.24 179:3 193:22,24 celotexs (2) 94:4 194:1 centre (2) 118:18 192:5 cep (25) 16:20 46:4,7,11,15,21 47:11,15 48:2,5,16,20 50:17 52:20 54:25 55:24.25.25 62:6 70:16 71:20,21 73:18,20 99:20 cep0000002672 (1) 51:1 cep0000002673 (2) 49:3 51:1 cep000000268 (1) 52:20 cep000000273 (1) 56:12 cep00000267 (1) 46:2 cep000003223 (1) 147:24 cep0000032232 (1) 148:4 cep00051297 (1) 75:19 cep00057294 (2) 161:6 163:4 сер000572942 (1) 170:22 certain (8) 47:22 77:13 110:4 122:6 151:12,13 152:6 176:14 certificate (2) 43:6,8 certificates (1) 120:15 certification (1) 178:18 certifications (2) 182:18 183:16 cetera (2) 37:3 182:1 cgl (1) 60:11

chain (5) 49:2,5 80:5 182:17 183:9,10,14

98:11 151:4 chairman (10) 1:9 4:20 5:2 62:16 105:2 108:1.7 169:18 204:1 207:15 chalcots (8) 143:6,14,21 144:19,24 152:7,10,17 challenge (1) 184:21 change (10) 65:9,18,21 66:2,8 93:7,11 104:5.17.19 changes (10) 31:11,13 64:25 65:1.15.25 66:5 104:2,20 192:10 changing (3) 102:7 190:12.21 channel (1) 84:6 characteristics (2) 206:15 207:2 chartwell (5) 94:24 95:4,14,16 96:16 chaser (1) 52:18 check (12) 35:13 46:24 90:18 105:11 134:2 139-1 151-22 196:4,6,7,11 197:1 checked (8) 6:15 32:3.8 33:1 58:14 151:19 166:20 196:10 checking (3) 32:5 99:9 200.24 checks (1) 42:12 choice (6) 24:8 35:3 46:21 69:6 79:24 85:19 choose (2) 9:16 71:18 choosing (2) 9:20 85:24 chosen (2) 61:25 81:25 cill (2) 148:19 149:2 circulated (1) 193:18 circulation (1) 36:19 circumnavigating (4) 173:25 174:18,23 175:2 civil (1) 118:17 clad (3) 7:4 36:3 182:21 cladding (74) 7:5.6 10:10 14:8,11 22:17 26:17 28:5.9 29:12 30:5.6.7.9.10.11.18.20 33:12 37:19,25 38:2,4 46:8,16,17,20 47:5 48:3 59:11 60:6.11.14 66:22,23 69:22 71:24 72:11 74:7 78:21 79:21 89:20 91:14 95:5 97:23 98:12 111:13 114:1 118:18 124:2 145:5,5 149:24 150:8 155:25 156:19 157:7 161:7 163:23 164:3 168:7 171:15,20 173:2 176:18 182:16 184:9,16 186:13 190:10 192:5 198:15,22 199:1 claire (3) 74:4 83:22 84:22 clarify (1) 25:18 class (18) 159:6,6,7,8 160:5 167:10,11,12 180:14,19,25 181:3,14

between (42) 5:17,20

42:24 65:8 68:23

16:13 30:1 35:3 40:19

203:12

184:23
classification (7) 116:20 121:17,22 122:12
166:24 176:1 183:24
classifications (4) 159:11 167:10
180:3,22
classified (1) 180:19 clause (9) 37:19,24
38:11,24 40:1
42:14,20 53:16 88:18 clauses (1) 38:3
clean (1) 84:13
cleaner (1) 84:7 clear (11) 29:23 35:14
112:9 133:15 144:20
162:23 174:11,12 175:11 188:20 193:8
clearly (2) 1:25 177:11
clg00000224 (1) 154:7 clg000002246 (1)
159:15
clg0000022493 (1) 155:4
clg0000022495 (1) 155:17
clg0000022497 (1)
158:18 client (4) 21:23 74:15
121:6 191:10
clientarchitect (1) 95:6 clients (10) 18:6 58:25
75:14 86:13,20 120:14
121:2 122:7 132:3 163:10
close (3) 185:6,15 187:22
closely (5) 14:4 25:4
26:1 57:6 118:18 closest (1) 205:20
closing (1) 188:3
codes (5) 153:1,3,13 154:24 155:2
colour (1) 76:6
colours (9) 22:20 23:9 43:3,3,4 68:4 76:3,4
77:13
column (10) 29:12 30:5,9 94:8 185:3,13
186:9 188:12,25 190:7
columns (1) 83:2 colwell (1) 205:24
combination (1) 97:22
combustibility (27) 159:21 160:3,9,14
164:2,11,17
166:5,14,25 167:18,25 168:6,11,14 171:15
172:6 176:2,4
180:14,25 181:4,17 188:17 189:5,11
204:19 combustible (13) 88:1
155:24 156:8 161:7
163:22 165:2 188:11
192:15,24 206:8,11,25 207:10
come (31) 15:4,6 18:12 28:5 31:14 34:9 58:19
59:19,22 62:22 65:13
78:7 92:6 105:2,13 113:8 115:1 120:3,21
128:23 130:8 159:7

161:24 169:22 174:11 66:21 72:25 73:8 177:12 191:3 193:19 133:11.22 168:6 194:4 201:10 207:20 171:11 181:24 182:20 comes (4) 28:21 48:5 183:17 191:21 195:17 196:5 197:3.7 comfortable (2) 1:14 complied (7) 69:6 119:5 153:8 156:12 157:15,16 195:10 complies (1) 196:8 comment (7) 40:25 comply (3) 201:15,20 42:3 67:23 74:24 75:9 202:20 complying (1) 171:5 component (1) 168:21 components (19) 97:23 commercial (1) 126:24 112:13 113:23 114:17.20 135:13,16,20,21 commonly (2) 189:4,10 164:2,11,17 166:5,8 182:16 183:14 184:24 185:7 190:12 composite (2) 18:14 20:18 composition (1) 42:7 computer (1) 110:5 communications (3) concealed (2) 84:14 185:15 companies (8) 47:9.18 concerned (10) 14:7 71:5 112:25 113:8 48:13 59:8 77:2,18 82:5 140:11 163:16 company (23) 35:12 178:20 198:25 concerns (4) 71:7 75:12 50:16 64:15 90:18 88:12 197:6 111:8.11.15.18.25 conclusion (1) 62:12 conclusions (1) 174:10 conditions (3) 196:12 141:25 143:15 194:3 197:11.18 confident (4) 20:23 companys (1) 138:23 91:7,10,18 comparative (2) 38:3 configuration (1) comparator (1) 72:18 confined (1) 8:25 comparators (1) 73:22 confines (1) 165:14 compared (2) 82:18 confirm (6) 2:10,17 109:18 110:3,13 196:4 comparing (3) 72:10 confirmed (3) 74:9 117:23 177:3 compartmentation (2) confirming (1) 53:1 connect (1) 161:4 connecting (1) 140:18 competence (1) 130:3 consent (1) 143:2 competent (4) 129:21 consider (15) 7:15,20 8:3,18 76:15 90:15 competitive (1) 8:14 113:12 150:22 151:2 152:20 174:16 178:19 compiled (2) 58:12,13 201:4 202:6,11 consideration (5) 3:22 87:19 97:22 149:16 complaints (1) 84:10 164:16 complete (6) 58:24 considered (3) 10:25 164:3 168:20 171:19 79:12 182:15 considering (4) 28:6 completely (2) 40:14 43:10 110:21 173:10 consisted (1) 57:20 completion (2) 199:22 consistency (1) 163:9 consistent (1) 95:24 compliance (14) 69:12 constitute (1) 203:3 97:25 125:18 126:6 constrained (1) 8:25 127:5 134:3 163:14 construct (1) 200:5 construction (16) 3:1 173.3 11 16 195.24 10.12 14 16 41.6

63:14 121:16

coming (4) 2:21

83:24 85:1

177:21

172:19

31.12

98:12

comments (2) 85:2

commissioned (1)

communicated (1)

communicating (1) 115:9

communication (1)

94:3 194:16,19

129:17,18 195:6

42:12 44:10 47:9

112:18.24 113:7

133:2,5,7 138:12

203:23

88:2

82:22 174:9

149:10,11

compass (1) 135:1

197:15,22 198:6

compile (1) 3:15

compiling (2) 3:20

103:4

190:10.20

148:16

203:4

196:22

170:23 172:23

compliances (1) 195:18

compliant (16) 9:18

45:19 155:19 159:20

161:1 163:7 181:16

185:15 186:8 199:22

107:14,17 110:18

108:13

200:1,10 consultant (11) 151:2 158:1 169:15 183:22 186:1 187:11 188:24 190:2 191:1.10 202:15 consultants (12) 151:20 154:16 156:11 157:3,23 161:15 171:8 174:9,11 175:9 194:11 199:21 consulting (2) 201:16,22 contact (3) 3:14 44:5 51:18 contacted (2) 69:1 139:23 contain (2) 206:14 contained (5) 19:1 73:6 77:20 148:17 153:11 contemplated (2) 90:12 106:11 contents (4) 2:17 109:18 110:3,13 context (2) 96:20 177:12 continuing (1) 119:17 contract (14) 28:22 34:7 57:11 66:3 133:19 195:15 196:13 198:9,17 199:4,7,7,13 201:6 contractor (8) 3:16 12:1 37:6 56:16 65:7 124:2 196:20 202:5 contractors (12) 11:10,20 12:8,10,22 13:3,22 25:8 37:1 57:10 58:2 130:21 contracts (3) 131:24 199:9.14 contractual (2) 195:1,9 control (14) 36:9 142:17,23 160:21,23 162:4 163:15 164:9,9 170:18 173:22 184:10 193:11 196:4 convenient (2) 62:16 107:24 conversation (13) 49:8,15,18 51:12.19.22 54:20 65:17 69:2 100:4,10,11 101:25 conversations (3) 75:24 90.20 152.6 convinced (1) 84:18 copied (34) 14:15 15:7 18:2,3,16 19:16 20:12 21:12 22:1,22,23 23:1.6.17 24:10 43:17,22 44:1,4,6,9 46:7 56:14 57:23 66:15 74:19 75:16,21 77:19 81:15 83:18.22 86:9 87:6 copies (1) 84:22 copings (1) 83:2 copy (5) 2:7 23:18 44.23 74.23 191.10 copying (1) 83:24 core (12) 24:24 33:19 34:14,14,19,21,23,25

44:24,25 103:21,22 corner (3) 29:1 102:25 178:2 correct (34) 14:13 64:1.12 111:9.19.20 112:10.11 114:7,8,20,21 116:4,5,16 118:1,2,6 119:10,11 126:3,4 128:22 131:11 134:12 138:18.19 140:15 141:21 144:9 152:12 155:15.16 193:9 correspondence (1) 44:16 cost (68) 3:22.23.23 9:13,14,15,15 13:23 18:7.13 20:23 25:9 30:4.8.24 41:4 43:5.5 45:21 57:12.17 60:24,24 61:1,22 66:21 68:2 71:17 72:10,20,24 73:4 74:24 75:4,10 77:17 78.2 5 80:1,9,13,19,22,24 81:16.20.24 82:10 84:15 85:4,8,10,23 87:15 89:16 91:7,10,16 92:1,1 100:20 101:11.21 102:1,3,8,14,15 costed (1) 45:23 costing (4) 41:15 79:23 80:14 86:24 costings (5) 8:17 31:13,15 57:12 68:15 costs (14) 3:25 4:1 18:13 38:4 45:6 57:18,19 60:21 61:10 70:19.20 75:13 78:9 85:15 couldnt (6) 19:10 47:2 64:4 91:21 133:18 144.25 counsel (5) 1:16 105:9 108:19 209:4.6 counts (1) 118:13 couple (6) 113:4 128:4.6 129:16 202:3 203:24 course (13) 75:3 108:25 116:19.24 117:2,4,8,10 118:10,16,20 182:6 204.5 courses (2) 113:1,3 covered (3) 117:4,8,10 cpd (3) 9:24 124:12,15 create (1) 82:12 created (5) 12:5 69:19 93:19 187:9 205:18 creation (2) 64:9 186:13 criteria (9) 156:17 157:1,2,12 158:5,7 164:5 171:21,25 cross (1) 55:1 crosschecked (1) 161:15 crossing (1) 75:17 crosspurposes (1) 72:21 crown (4) 29:12 30:6,9 80:24 crystal (1) 35:14

cumulative (1) 66:24 current (6) 21:17,19 37:13 85:3.6 124:22 curtain (19) 5:5,25 6:24 17:22 32:23 33:11 45:14 49:10 51:14 91:15 111:12,13,14 112:9,25 114:1,6 116:18 179:12 curtins (2) 201:16,22 customer (1) 28:22 cut (1) 94:24 cv (7) 115:15 141:2,2,5,8 142:3,25 cwct (28) 36:7.7 78:23 118:19,22 123:6.8.13.15.18 177:2.4.22 178:3,7,12,16,22 179:3,6 185:1 192:6.8.13.15 193:9,14,15 cwct0000019 (1) 179:9 cwct00000192 (2) 180:2 185:2 cwct00000194 (1) 186:6 cwct00000195 (1) 187:20 cwct00000196 (1) 188:10 d2 (3) 159:6,8,12 dan (2) 96:12 177:21 dangerous (2) 186:12,21 daniel (25) 25:23,25 31:25 32:6.9 33:2 35:17 41:9.20 87:7 90:23 96:10 98:23 99:1.5 108:9.11 139:11 141:6,13,13,15 142:14 177:19 209:5 data (4) 27:19,23 156:20 157:1 database (2) 93:20 177:15 datasheets (1) 191:1 date (19) 10:2 13:8 14:12.17 30:1.1 56:17 67:1 94:7,8,9 96:8,23 122:16 124:3.12 145:22.24 148:5 dated (19) 2:6 14:6 15:16 18:1 19:6 28:19 36:19 37:12,16 43:9 49:6 51:3 52:21 109:11 110:9 148:5 161:8 203:14 205:24 dates (1) 26:23 day (11) 22:8,10 49:16 57:24 58:21 83:21,21 86:7,7 138:4 207:18 day321721 (1) 125:19 day346523 (1) 63:21 dav34665 (1) 64:2 day359013 (1) 106:7 days (3) 75:20 77:7 113:4 daytoday (1) 131:9 deal (4) 19:21 110:4 121:11 168:25

culture (1) 174:23

dealing (5) 6:5,7 99:14 130:23 194:2 dealings (3) 193:22,23 199:12 dealt (2) 137:10 177:7 deb (2) 22:13 74:23 debbie (3) 22:10 43:19 75:24 deborah (4) 22:23 23:5 76:12 77:8 debris (6) 205:1,5,13 206:18 207:3,11 december (17) 13:20 14:1 15:1,7 16:3,8 24:11 25:6 26:2,8 36:14.24 38:21 49:6,16 53:21 110:9 decemberjanuary (1) 102:16 decided (2) 34:7 115:9 decision (6) 55:11,15 77:1 99:15 129:5.11 decisionmaking (1) 98:11 decisions (2) 31:11 124:7 deduce (1) 153:18 deep (1) 84:5 deeper (1) 184:24 deferred (1) 183:21 deficiency (1) 196:21 definition (4) 160:8 185:14 189:5.11 definitions (3) 180:14 185:4,4 degree (7) 57:2 111:7 126:19,23 159:10 191:16 205:16 delaminated (1) 145:1 delamination (2) 166:7.13 delay (1) 23:8 delayed (1) 1:3 delete (1) 137:22 deleted (3) 137:9 138:5 139:13 deleting (1) 139:1 deletion (1) 110:4 deliver (1) 47:23 demands (1) 128:9 demonstrate (1) 171:10 demonstrates (1) 79:5 demonstrating (2) 171:11 172:23 department (2) 99:7 118-17 departure (1) 126:17 depended (1) 127:18 depending (1) 185:25 derived (1) 60:9 describe (1) 128:1 described (3) 180:13 182:17 183:14 description (2) 3:10 79:1 descriptions (2) 89:19 180:3 design (119) 3:23 8:8 11:11 42:5 53:1 58:23 59.2 86.12 98:5,7,20,21 99:16 104:18 111:8,12,13,21 112:4,22 113:7,15

114:1,13 115:4,13
116:9 119:18,19 122:25 123:4
125:5,9,12 126:1,5
127:17,21 128:2,11 129:3 130:18
131:9,12,12,14,25
132:2,6,9,20
133:7,11,22 134:11 135:3,11,11,12,14,15
136:6 137:24
142:16,17 143:24 144:10,10 151:19
157:10,20,22,25
160:16 168:3
172:12,25 173:17 183:4,20,21 184:2
185:7 188:22
193:16,17 195:8,12,17,24
196:3,15,22
197:7,12,20
198:2,6,11,14,17,21,25 199:6,7,8,11,15,15,16,2
200:1,5,10,16,18,21
201:1,18 designed (3) 147:2,10
153:13
designer (17) 112:1,16,24 113:11
114:19 127:19,22
128:20 129:7,14
132:20 134:24 173:5 196:21 197:14,21
198:5
designers (9) 128:7,16 129:21 130:19
131:4,21 133:1,18
195:13 designing (11) 98:25
104:16 112:12,13
114:16,17,20 135:4,9,10 149:15
designs (2) 115:4 196:3
desire (1) 87:1
desk (3) 2:6 109:10 110:12
desktop (10) 161:13,14
163:1 171:6,9,23 172:14,18 174:2 175:7
despite (2) 53:11
146:24 destroyed (1) 148:16
detail (12) 10:17 13:17
57:18,19 58:19 80:20
120:4 121:7 128:2 152:20 161:25 193:22
detailed (7)
13:7,10,11,14,14 19:6 120:22
detailing (4) 142:17
144:1,7 183:4 details (9) 23:12 42:6
80:11 112:5 141:5
142:1,2 144:1 190:20
<b>determine (3)</b> 69:5 98:16 128:25
determining (1) 163:14
developed (2) 206:13,25
development (2)
119:17,25 developments (2) 10:10
acreiopinicità (2) 10.10

```
124:4
devote (1) 19:11
diagram (4)
 158:14,17,18 159:5
didnt (80) 4:7 10:9
  15:23,24 16:7 23:13
 24:11 25:19 44:1,19
 47:1,20 50:17 52:3
  54:6,7,9 55:23 61:5
 66:4 68:21 69:13 70:9
 71:12 73:13.20 78:3
  80:2 88:3,12 90:24
 91:2.3 99:24 100:17
 101:1,5 106:21
 107:6,10 118:7 121:19
 123:1 126:3 140:7.8
  144:20,22 145:11
 148:25.25 149:18.18
 150:11 151:4.23
 157:15 160:5,11,23
 161:3 164:18 167:24
 174:16.17 176:11.14
 181:2 182:9 187:14
 189:18,20 193:8,11
 194:5.10 195:21
 201:24 205:9 206:23
difference (14) 5:23
 42:24 72:12,14,20
  73:4 81:3 87:16 88:17
 157:5 180:24 185:11
 186:3.5
different (33) 9:8 12:10
 15:3 16:10 17:3 24:17
  44:23 60:16 64:12.13
 76:22 87:21 88:8 90:4
 102:8.20 103:1
  107:7,8 109:2 113:8
 117:4,5 136:6 158:5
 170:23 171:4
  174:8,10,12 175:5
 180:3 185:25
difficulty (2) 1:20
diploma (1) 3:4
dipping (2) 130:25
 136:3
direct (2) 175:1.3
directly (4) 28:1 67:15
 205:6,13
director (1) 137:16
directors (1) 173:8
dirt (1) 84:8
discern (1) 145:16
discovered (4)
 85:13,15,16 86:24
discrepancies (1)
 196:14
discuss (4) 23:15 41:14
  85:20 207:23
discussed (10) 2:20
 23:8 65:11 67:24
  74:11 87:11 96:4,20
 104:9 110:17
discussing (4) 118:24
  149:5,9 152:16
discussion (15) 18:19,20
 61:20,23 65:8,22 66:1
  68:22 71:21 88:5
 93:12 95:25 96:22
 97:16 204:10
discussions (11) 62:2
```

```
97:3
distinction (7) 107:7
  114:18 125:25 172:3,6
  181:3 185:20
distribution (4) 146:6,8
  148:8,9
divided (2) 136:5
 153:25
document (93) 12:2,6
 15:8,19 16:1,12 17:18
  19:2 21:9 28:25 30:3
  38:21 40:9 41:7,12,13
  43:10.13.17
  44:12,19,22 45:4,24
  58:4,10,13 59:4 63:17
  64:5 69:6.12.17.19
  72:4 73:17 78:23 79:3
  82:12 89:14.18.20.21
  90:4.22 92:16
  93:18.19.21.22
  94:1,21 100:23
  102:20.21.23 103:5.7
  115:24 119:12
  122:1,19,22 141:10
  146:21 154:6.8.10
  156:25 158:2 160:8
  161:11.17.18
  163:19,21 174:1,19
  177:9 179:9,10
  181:10,11,12 182:19
  183:17 201:22 202:21
  203:8,14,18,21 205:20
documents (27) 3:13
  11:9 13:4,13,23 15:1
  25:9 27:14 29:8 36:16
  38:25 44:7 46:11
  58:25 64:20 78:17
  79:15 97:12 101:10,18
  102:6 137:24 140:13
  160:20,25 174:24
 179:23
does (28) 8:24 10:9,14
  23:20 41:11 42:8
  43:20,21 55:14 56:1
  70:9 76:25 90:8
  101:14 104:22 107:6
  119:1 131:7 134:1
  160:12 166:24 170:22
  174:15 184:13 195:22
  201:23.25 206:1
doesnt (5) 2:1 64:14
  88:17 101:15 117:17
doing (17) 9:12 19:11
  20:10,11,15 131:14
  135:17 136:8,14 155:2
  157:10 162:5 173:13
  179:20 184:25 200:14
  205:16
done (20) 8:18 11:13,24
  22:25 32:4 34:13
  59:25 69:5.14 79:18
  95:20 118:12
  126:18.23 132:20
  147:23 161:13 172:10
  191:15 207:16
dont (91) 2:3 16:25
 17:10,11 18:24 19:5
  24:23 36:20 37:5
  39:11 45:11 48:17
  49:17.20.24 50:10.16
  51:23 52:2 53:22
  56:10 61:19 62:2,23
  66:10 68:10
```

```
75:8,11,17 80:12,21
  84:9 88:7.9 89:7.16
  92:5,23 94:14 95:15
  96:6 99:20.21
  100:12.15.22 101:10
  104:14,25 105:17
  123:23 125:21,21,22
  130:11 134:19 139:24
  140:8 142:5,6 143:18
  148:3 149:1,19 150:10
  157:15 161:20 165:20
  168:18,18 169:24
  177:1 178:5.8.21
  179:4 182:8 183:19
  190:24 193:1,2,4,6
 194:16.17.18 197:16
  199:18 204:15 206:4
down (40) 1:14 2:1 8:20
  14:8,8 16:18,22 18:5
  20:4 21:16 22:14 49:4
  50:11 53:4 57:17 60:5
  67:20 70:7
  76:19,21,24
  83:19.20.25 94:6.9
  98:14 108:13 109:6
  120:6 148:6 153:25
 154:18 163:19 166:22
  175:23 180:5 188:25
 194:4 204:23
draft (1) 78:22
draughtsman (4)
 141:13.21.23 142:4
draw (4) 113:9 142:2
 180:2 187:11
drawing (7) 114:18
  128:5 135:12,16,21
 141:25 142:1
drawings (34) 3:13 7:18
 8:10 11:12 12:4
 13:14.24 25:10.14
  27:4,6,12 49:13
  51:16,17 52:7 60:1,2
 97:12 99:14 101:6
  112:7 113:10
  114:14,15 128:6
 131:19.19 132:13
  134:6 137:25 140:12
 144:8 190:25
drawn (2) 19:7 185:20
drew (4) 16:6,11
 169:8,13
dropbox (1) 51:17
drove (1) 152:13
dtz (1) 95:6
due (4) 20:20 141:16
 142:9 186:13
during (11) 36:3 43:13
 103:7 115:17 118:10
 136:6,17 152:7,10
 193:23 205:2
durkan (1) 12:18
duties (2) 114:12 195:1
e (19) 12:5 14:6 15:13
 18:2 19:15 22:16
```

31:12 65:6,9,10,23

66:2.5.8 86:9 159:1

earlier (24) 19:2 25:11

162:19 173:18 196:21

27:2 45:4 48:13 58:18

59:6 63:16 71:1 77:7

```
83:21 86:7 90:24
  95:25 104:8 106:12
  118:25 119:1 125:8
  136:4 155:13 183:8
 191:3 207:22
early (2) 16:3 134:15
easier (1) 115:11
easiest (1) 74:22
easy (1) 177:15
edges (2) 187:22 188:3
edition (7) 154:7
  175:16 202:23 203:13
 205:21.23 206:2
educated (1) 160:16
education (1) 193:6
effect (1) 198:24
effective (2) 202:7,11
effects (1) 76:3
eg (2) 97:23 176:7
either (29) 18:18 32:6
 33:1,25 36:3 41:7,20
 42:4 43:2 47:14 69:25
 87:20 90:13 97:4
 98:22 99:5 104:11,23
 106:14 129:10 147:16
  148:25 156:15,24
  159:13 164:1 178:12
 192:8 196:20
electrical (1) 111:2
element (2) 200:5,10
elements (6) 11:1 25:18
 58:11 171:15 185:7
 200:7
elevation (4) 27:12
 49:13 51:16 52:7
elevations (2) 169:13
eliminates (1) 18:8
elongate (1) 165:14
else (17) 47:16 66:7
 68:23 69:5.14 71:21
 87:20 99:6 127:18
  129:8 133:23 149:19
 152:16 172:13 173:18
 184:21 194:7
elses (1) 195:23
elsewhere (2) 41:12
 90:3
email (89) 14:6,8,15
 15:12 18:1.18 19:14
  20:5,12 21:12,16
  22:1,8,9,11,13,24
 23:14 26:10.20.20
  27:2 36:13,17,22
  37:13 43:17 46:6
  49.2 5 16 17 24 50.1
  51:3,20,21 53:21
  56:13 57:22 66:13
  67:19 74:3.18.23
  75:12,16,19
  77:7.19.20 78:12
  79:16 80:4,6 81:14,20
  82:9 83:17.19.20 85:7
  86:5,7,22 87:5 91:11
  94:21 96:7 100:1,9,14
  101:3 102:17
  120:2,6,8,9 121:8,13
  139:15,20,24 140:22
  161:24 162:2,9 191:4
  194-19
emails (11) 14:9 15:8
 24:6,10 137:9,24
  138:15 139:13
```

```
140:12,19 194:21
emphasised (1) 188:2
employ (1) 129:11
employed (1) 114:9
employees (1) 162:15
employer (1) 47:10
employers (4) 7:20
 196:15 197:2 201:5
employment (3) 47:21
 137:14 138:4
enclose (1) 80:10
enclosed (1) 100:5
encompassed (1)
 185:24
encourage (1) 163:8
encouraged (1) 124:19
end (12) 66:1 99:11
 105:2,10 113:15
 114:24 118:7 125:22
 127:2 138:5,20 179:21
ended (1) 126:21
engage (1) 124:2
engineer (6) 113:20
 114:11,12 115:10
 122:25 150:14
engineering (30) 59:15
 66:14 67:7 68:8
 71:14,23 72:13
 76:8,16 79:18 111:3
 114:25 115:6,7,8
 116:1,2,6 118:5,17,20
 126:23 142:16
 153:2.3.12 155:1
 171:12 191:9 194:7
engineers (2) 184:10
 192:6
england (2) 180:9,12
enough (11) 105:7,8
 126:18,23,25 129:2,10
  174:11 184:23 193:2
 207:18
enquiries (4) 3:12 14:2
 36:24 92:21
enquiring (1) 101:21
enquiry (1) 52:24
ensure (8) 25:12 41:5
 129:20 130:22 137:21
 172:21 173:1 195:10
ensuring (4) 127:20
 136:9 195:17.23
entail (2) 113:19 128:3
entails (1) 3:11
entered (1) 169:1
entire (3) 52:6 163:25
 200:1
entirely (1) 136:25
entitled (2) 179:11
 201:17
entries (1) 17:15
entry (5) 93:20 94:5
 95:24 177:14.24
envelope (6) 45:5 58:24
 155:22 205:6.14
 207:13
equal (7) 38:19,23
 39:14,20 40:2,8,22
equated (1) 113:4
equivalent (1) 180:22
error (16) 79:23
 80:1.9.13.19
 81:6,16,24 82:10
 83:6,14 85:8,10,16,19
 86:25
```

essence (1) 80:22
essentially (4) 29:2
48:21 50:21 83:23
establishment (1) 122:4
estate (5) 143:6,14,21 144:19 152:7
estimate (5) 13:23 25:9
27:16 118:9 136:16
estimates (1) 12:21
estimating (6) 8:25
9:12 34:5 83:5 85:8 134:14
estimation (1) 22:5
estimator (8) 3:8 8:7
10:25 20:8 24:1 33:10
63:24 70:25
et (2) 37:3 182:1 etc (3) 146:25 159:19
191:23
euro (5) 153:1,3,13
154:23 155:2
european (3) 159:6,11
180:22
even (12) 17:7 24:12 35:10 44:22 47:21
71:14 137:2 143:18
164:19 190:24
191:6,13
event (1) 65:9
eventual (1) 23:4 eventually (2) 21:3
29:24
ever (41) 7:10 18:22
43:13 45:21 66:1 88:4
92:20 103:7 123:12
127:11 141:8 142:3 146:18 147:7 148:22
150:19,22 151:7
152:7,10,16 154:18
158:18 160:2 164:16
168:10,13,16 172:8
173:15 178:6 184:21 194:21 196:6,7 197:6
199:3 200:23 202:2
203:16 204:12
every (3) 12:2 200:5
201:7
everyone (1) 1:5
everything (3) 86:16 138:11 200:17
evidence (23) 1:18 2:20
62:4,5,24 63:22 64:11
105:18 106:5 107:18
108:22,25 110:17
118:3 125:15 138:25
152:5 164:3,12 169:25 171:19 181:20 207:23
evident (2) 120:23
146:24
exacerbated (1) 165:2
exact (1) 151:10
exactly (7) 29:25 57:19
58:4 70:18 92:8 182:21 184:8
example (16) 9:7 10:3
16:18 32:22 39:25
45:22 50:13 69:24
72:7 84:12 117:7
128:19 132:12 137:23 172:5 183:25
examples (1) 176:5

64:8,10 66:5,8 70:5

76:17 85:22 92:9,15

exceeds (1) 163:24

excluded (3) 90:2,4,7
excluding (1) 61:21
exclusion (2) 45:13,15
exclusions (1) 17:15 exercise (1) 76:9
existed (1) 179:23
exit (1) 32:22
expect (1) 98:4 expectation (2) 32:7,25
expecting (2) 52:10
158:1 expensive (3) 72:19
73:3 74:7
<b>experience (12)</b> 13:8
71:16 83:4 133:8 141:16 142:9 143:5
175:1,4,5 193:5
194:17
expertise (3) 194:17,23 200:5
expire (1) 28:21
expiry (1) 30:1
<b>explain (16)</b> 16:9 17:1 30:16 32:13 70:9
80:10,17 83:8,13
111:6 114:4 128:24
131:20 137:13 174:5 191:6
explained (1) 81:19
explore (2) 14:4 68:8
exposed (3) 203:5 205:5,13
expressed (1) 21:5
expression (1) 40:21
expressly (2) 133:15 202:5
extend (1) 9:17
extended (1) 56:17
extensive (5) 147:4 148:18 155:25 156:8
165:3
extensively (1) 9:11
<b>extent (4)</b> 133:10,21 165:20 191:21
exterior (2) 97:23
181:24
external (39) 41:5 45:5,18 69:7 114:1
122:2 123:21
128:15,20,25
129:6,11,14,21 152:2 155:9,19,22
156:15,18,24 158:9,13
159:20 163:23
164:3,12 165:1,12 171:19 181:12,16
198:15,22 199:1
202:22 203:21 204:18
207:12 externally (2) 67:11,14
extra (1) 30:24
extracted (2) 25:13 37:8
extremely (1) 1:19
exworks (2) 19:23 31:4
eye (1) 14:10
F
faade (30) 10:7 59:2

162:23,25 203:9 120:8 fancy (1) 10:19 118:9 131:11 140:11 149:20,22 153:12 167-6 172-17 191-24 104:16 113:8 192:3,11 193:18 114:19,25 116:2,6,20 198:25 118:5,20 123:3 126:23 fatigue (1) 79:4 131:9.14 144:11.24

147:16 149:15 157:10 169:4.10 192:6 193:17 194:7 195:17,24 198:1.6.11 faades (8) 112:12 114:2,16 116:9,12 122:6 123:21 137:14 fabiunke (1) 86:9 fabric (1) 147:3 fabricate (5) 47:2 48:2.5 54:21 61:13 fabricated (20) 18:9 28:4.12.14 31:4 48:14 50:17 53:19 54:14,19,25 55:12 112:13 114:15.17.20 135:12,16,20,21 fabricates (2) 53:23 54:11 fabrication (19) 3:23 28:8 46:8,12 53:1 55:13 70:20 112:7 113:9,22 115:4 128:5 131:19 132:4 144:1,8 168:3 183:4.21 fabricator (8) 5:24 28:2 33:15 46:15.21 47:4 62:5 78:8 fabricators (3) 23:10 55:23 56:2 face (11) 49:12 67:21.24 74:13 81:18.21.22 84:13 86:16 165:12 186:13 faced (1) 88:23 facefix (1) 80:23 facefixed (15) 21:17 28:15 45:9,10 49:23 50:4,23 60:16,18 72:8 79:25 81:7 82:15 85:25 86:20 faces (2) 84:6,14 factor (1) 126:20 factory (1) 112:8 fair (12) 6:4 8:7 11:16 24:12 56:7 62:11 71:3 76:8 80:13 81:24 85:10 137:5 fairly (5) 34:6 38:24 91:7.10.18 fall (3) 77:15,16 205:3 fallen (1) 173:5 falling (4) 204:25 206:18 207:3,11 familiar (22) 10:2 35.20.24.36.6.71.3 93:21 119:13 120:24 121:12 122:1,4 152:23 154:9 155:14 161:11 179:15.17.18 199:8 familiarise (2) 35:10 far (20) 29:5 48:13 59:7 74:22 77:2 82:4 91:20

favourable (1) 71:15 favoured (1) 4:12 feb (1) 56:18 february (2) 28:21 135:1 fed (1) 149:19 feed (2) 129:9 149:18 feedback (2) 130:1,6 feel (5) 49:14 56:24 71:13 108:15 109:3 feeling (2) 124:14,21 fell (1) 126:12 ferrier (6) 143:6.19.20.24 144:5 150:4 few (3) 96:13 113:1 137:9 fifth (2) 53:4 134:22 figure (4) 59:7 72:9 82:19 101:16 figures (13) 16:17 30:7 58:7,10 62:7,8 72:22 73:11.14 77:17 81:9 90:25 182:22 file (4) 15:8 44:16 139:15.20 filed (1) 44:2 files (1) 140:3 filler (2) 159:18 188:15 final (7) 42:17 55:11,14 58:7,10 88:15 110:11 finally (1) 168:23 financial (2) 82:5 87:2 find (9) 4:18 51:13 66:18 73:17 78:20 100:4 151:14,15,25 fine (4) 29:18 95:23 105:16 204:5 finish (8) 20:19 43:1,2 67:25 68:3 70:7 74:7 finished (1) 106:6 finishes (7) 22:19 38:7 60:25 70:6 76:18,21,23 finishing (1) 111:7 fire (137) 17:17,22 32:16.22.23 33:4 34:19 35:3,11,24 36:2 42:10 44:25 45:13.16.18.22 87:22,22 88:5,11 97:24 107:2.3.8 113:12 116:11,15,19,25 117:10,11,12,24,25 121.18 122.1 20 139:12 145:13,22 146:10,19,24 147:1,1,2,9,11,13,19 148:16,17,18 149:3.7.10.16.17 150:13,19,22 151:2.4.13.21.23.24 152:1 153:17,23 154:4,8 155:10,23 156:17 157:3,23 158:1 161:14 165:1,13 166:2 167:13 169:1 171:8,11 174:8,11 175:9 179:11 181-25 182-5 183-21

184:9 185:8

186:1,11,17,20,24

187:2,6,10 188:7,23

189:15 190:2,14,23 191:1.10.14.25 194:18 202:8,12,13,15,21 203:2.3 204:8.9.13 205:2.4.18.21 206:16,17,19,19 207:3,4,11,12 firebreak (1) 147:10 firebreaks (2) 149:1 185:23 firefighters (2) firemen (1) 187:3 firerelated (1) 194:6 fireretardancy (1) 97:25 firestop (2) 185:4 186:3 firestopping (3) 147:16 149:6 185:22 firm (5) 27:10.15.20 62:8 115:8 first (42) 14:5,19,21 15:25 16:18.23 17:18 23:14 25:22 26:20,20 28:3 36:21 43:8 52:22 55.6 66.18 74.4 82.14 83:10 85:13 98:9 102:11 109:11 110:23.25 118:22 125:3 127:16 137:12,13 141:2 142:1 143:15.16 163:5 164:25 173:20 176:2.6 183:1 192:11 firsthand (1) 8:22 fit (7) 31:17,21 32:12.19.24 42:9 185:6 fitness (1) 32:16 five (4) 111:17 148:5 204:3,5 fix (6) 58:23 81:18,21,23 82:6 fixed (5) 49:12 67:21,22,24 74:13 fixing (4) 81:25 88:8,11 97:24 fixings (5) 84:13 87:21 98:13 205:1.4 flame (12) 165:11.14.22 166:6,24 167:1,9 175:25 185:16 205:6.14 206:15 flammable (1) 146:25 flashings (3) 80:23 83:2 190.11 flat (4) 29:15 86:17 145:13 146:25 flats (3) 147:2,12 149:11 flip (1) 94:19 floor (2) 145:14 188:15 floors (2) 148:18 165:13 flow (1) 130:20 flue (1) 186:14 foam (5) 167:17 168:5,5 176:8,20 focus (3) 53:9 72:6 154:25 focused (10) 76:10.20

136:25 137:8 153:1

188:22

168:3 179:19 183:4.20

focusing (1) 192:11 foil (1) 88:23 folder (2) 2:6 109:9 follow (15) 4:10 8:10,21 31:8 35:23 56:1 67:17 74:1 82:4 89:3 151:17 157:13,18,20 160:12 followed (2) 100:9 157:21 following (13) 8:24 15:13 22:18 38:5 49:8 78:20 80:10 100:5 142:14 157:6.11.24.25 follows (1) 182:11 force (1) 94:4 foregone (1) 62:12 form (4) 13:3 28:15 40:22 58:1 formal (6) 52:20 77:1 112:22 114:22 122:11,15 format (2) 88:1.2 formed (3) 17:8 194:3 195:5 forward (10) 49:9,13 74:23 77:17,22 142:25 175:6.9 179:20 196:3 forwarded (3) 23:18 36:16 99:21 forwards (1) 86:6 found (1) 109:11 founder (1) 111:18 four (7) 17:15 22:19 52:8 53:13 66:24 98:14 143:4 fourth (2) 67:19 139:9 fr (3) 24:24 34:19 44:25 fr5000 (12) 88:23 90:16,21 91:4 92:4,7,11,21 93:8 102:11 104:11.23 free (1) 107:18 french (8) 22:10,23 23:5 43:19 74:23 75:24 76:12 77:8 frequently (1) 134:2 front (9) 2:7.8 4:19 109:10 127:2 201:25 203:13 205:23 206:1 full (4) 42:6 74:15 127:9 156:19 fullon (1) 26:4 fully (3) 10:21 194:22 202:20 functional (6) 153:11.14.16.19 154:3 155:5 further (16) 50:1 51:12.17 56:17 57:17,18 64:19 89:20 100:4 107:12 147:21.22.24 166:22 175:19 188:25 future (3) 20:14 45:24 138:18 G

garnock (2) 204:8,13

gave (2) 29:24 106:5

general (22) 5:4 8:12

10:10 35:20 36:2

44:21 114:12 128:24

gaskets (1) 159:19

207:3 75.20.22 164:21 164:16 181:20 glass (1) 7:5 206:12 glazing (4)

129:4 156:7 166:11 171:4 172:3 178:13 188:6 189:14 191:13 199:9 201:11 205:10.15 206:24 generally (14) 9:5 30:7,11 92:11 116:21 128:2 150:21 154:16 159:24 165:18 182:15 190:15 194:5 206:14 generate (4) 29:4 204:25 206:18 207:11 generated (2) 102:21.24 generating (3) 205:5,13 generic (1) 34:6 geof (15) 46:6 49:5,21 50:7.16 51:4.7.11.19 53:16 56:13.15 60:21 get (25) 2:1 3:15 8:11 10:2 12:16 24:21 27:19,20 40:18 43:4 47:17 56:18,24 84.9 25 90.25 105.5 113:23 127:11 130:6 131:25 165:21 174:8 185:14 190:2 getting (2) 163:2 give (6) 1:18 2:21 106:18 108:22 157:18 given (29) 23:19 27:9 55:23,24 57:18,20 72:13 73:15 82:16.22 87:19 91:20 92:2,14 94:1 97:22 98:16 119:21 131:7 149:16 150:24 152:5 156:16.17.25 166:7 180:14 192:13 201:7 gives (4) 30:12 163:21 176:4 185:4 giving (3) 24:14 158:23 glad (1) 56:18 glare (1) 84:9 glassreinforced (1) 103:13.14.19.22 goes (10) 18:11 20:17 64:2 76:1 84:11 104-19 165-10 166-3 185:2 187:16 going (38) 1:6,9 2:21 4:6 15:6 28:2.6 46:2 48:23 52:3 61:13 62:20 68:19.24 70:7 74:8 76:18.20.24 77:2 90:11.13 99:13 105:12 106:10,14 113:23 115:1 120:3,6,21 123:16 136:15 140:2 144:19 177:12 187:3,10 golden (1) 6:23

109:7 129:18 163:8 206:15 207:15.16 208:6 goods (1) 74:6 government (2) 181:11 governments (1) 182:22 graduated (1) 111:1 graham (7) 126:14,15 148:10 177:7 193-19 25 194-12 grange (13) 108:6.7.9.18.20 117:23 169:17 170:15,16 203:24 204:6 207:15 208:8 grateful (2) 1:19 107:16 great (4) 6:22 7:2 10:17 19:21 grenfallsic (1) 95:11 grenfell (116) 6:19 7:9 9:7 10:24.25 11:8 14:19 15:6 16:8 20:14 21:4,22 22:4 24:11 43.14 44.6 48.22 52:25 56:9 57:25 66:19 75:25 76:2.7 80:2,9 81:15 87:8 90:17,21 92:22 93:5 96:16,20,24 97:13 99:23 101:3 102:15 103:8 115:16 118:6.10 119:3.13 122:9.24 123:2.7 124:25 125:4,10,16 128:16,20 129:4 130:18.25 131:5,9 134:10,24 136:3,17 137:7 141:3,14 149:15,25 150:20 152:22,25 154:10.13 156:5 158:19.25 159:9.25 160:24 161:10,19 165:19 166:12 167:5 168:11,17 171:3 172:10,16,19,22 173:11 174:15.22 175:12,20 176:12,21 177:4 178:15 179:16 180:24 183:2.24 185:20 188:21 189:9 194:13 195:1 201:13.19 203:16 204:13 205:21 206:3 grew (1) 112:18 ground (2) 159:18 188:16 group (1) 143:8 guarantee (1) 78:22 guidance (71) 9:19 10:5 36:7 77:10 119:12 133:12 154:21 156:15.23.25 157:6.11 158:2,3,23 159:24 160:7.13.19.20.25 161:5,6,22 162:4.10.11 163:6.21 164:8,25 165:10 168:1 169:7 170:18 171:5 173.12 23 174:6,16,17,24 175:15,16,19 176:12

179:6 180:2 181:10

gone (3) 58:6,9 151:18

good (19) 1:5,9,17 4:25

84:4 105:1 108:1,7,10

19:19 63:10 70:10

188:2.20.25 190:5 191:22 192:2.4.9.12.14.23 193:3.9.12.15 197:4 203:20,25 205:9 guide (3) 22:18 39:3 61:4 h (1) 84:4 h92 (1) 37:25 hackley (6) 126:14,15 148:10 177:7 193:19 194:12 hackleys (1) 193:25 hadnt (10) 21:24 62:9,9 116.24 122.11 125.23 147:13,14 193:10 194:13 half (1) 175:23 halfway (5) 22:14 29:25 60:5 94:6 108:14 hand (1) 40:20 handover (1) 199:22 happen (1) 140:8 happened (1) 80:10 happening (1) 130:9 happens (1) 41:22 happy (2) 92:19 128:10 har00000931 (1) 74:18 har00000934 (1) 43:7 har00000944 (1) 86:5 har000010169 (1) 145:21 har00001018 (1) 100:1 har00005444 (1) 19:14 har00005461 (1) 17:25 har00005512 (1) 22:9 har00005555 (1) 14:5 har00005692 (1) 77:6 har00005775 (1) 83:17 har00010149 (2) 109:12 110:24 har0001014918 (1) 109:13 har000101492 (4) 115:24 125:2 127:16 134:9 har000101493 (1) 130:16 har000101494 (2) 130:16 136:1 har000101496 (1) 181:7 har000101497 (2) 182:13 191:19 har000101498 (1) 173:21 har00010151 (1) 2:9 har0001015115 (1) 2:12 har000101512 (1) 11:6 har000101513 (2) 13:19 25:3 har000101514 (2) 31:10 57:6 har000101516 (1) 42:1 har000101517 (1) 97:19 har000101518 (4) 33:8 63:13 64:23 70:24 har000101519 (1) 98:8 har000101694 (1) 146:21 har0001018421 (1)

185:21,21 186:7

har00010513 (2) 109:22 137:12 har000105132 (1) 109:23 har00014785 (1) 82:10 hard (2) 2:7 191:15 harley (161) 1:7 5:4,5,14,22,25 6:5,9,18 8:3,15 9:23 11:1,3 14:13 18:17 20.21 22 21.3 3 24:14,20 26:21 28:21 29:24 30:23 31:12.23 36:4 41:16,17 46:15,21 47:18 50:21 52:21 56:8 59:7.21 61:10 65:2,8,17,20 66:4.7 67:11.12 68:23 69:5.11 73:6 76:14 77:2.24 81:6.22 85:11,18,21,23 87:2.20 88:4 90:21 91:25 92:3,4,6,12,20 93:12 94:5 96:23 97:4 98:5.7.15.19.21 100:19 102:21,22 106:23 114:6,10,16,22,24 115:3,14,25 116:13,18 119:4,16,25 122:15 123:2.5.5.8.23 124:20 125:13.25 126:8 127:3.12 128:24 129:8,13,20 130:10 133:16,23 134:25 136:7.23 137:14.21.24 138:5 139:11,13 140:22 141:15 143:11 144:10 147:2,10 148:2,10,23 149:7.15.24 150:16 152:16 157:9,19 162:15 173:1,7,16 175:5 177:3 178:16 184:21,25 193:15 194:12 195:4,16 196:14 197:12.19 198:14,21 199:20 200:14 harlevs (29) 9:11 11:9 21:5 29:5 57:5,21 59:1 61:24 67:2 75:13 80:2 82:5 89:1 94:18 101:6 138:21 140:3,12 145:20 194:25 195.10 23 196.2 25 197:25 198:10 201:3,15 202:10 harris (67) 6:15 7:23 9:4 14:6,16 15:5,12 16:5.13 18:2.22 19:15 20:6,24 21:11 22:10.12.13 23:6,15,24 24:21 26:25 27:10 31:14 32:1 41:20 43:20 44:2 46:7 47:14 49:9.19.21 50:7 56:13 57:9,12 58:14 61:20 63:21 66:13 67:8 13 20

84:21,23,25 85:7 86:2.6.8 87:6 173:9 havent (5) 2:22 18:7 92:18 140:22 142:5 having (16) 71:20 85:20 95:25 96:22 102:6 115:10 126:23 133:19 136:23 140:20 155:11 157:6 182:6 183:5 191:15 193:23 hazard (1) 203:3 head (6) 2:1,3 83:1 117:16 148:19 149:2 heading (9) 84:1 94:23 142:12 158:9 186:7 188:11 189:2 190:5 204:17 health (1) 155:24 hear (4) 1:6,10,24 152:16 heard (6) 122:5 152:9 154:3 160:2.20.22 hearing (2) 1:6 208:10 heat (1) 147:4 heated (1) 166:8 heaters (2) 113:16,21 heathrow (1) 96:17 height (4) 7:3 41:6 155:11 163:24 held (1) 184:3 help (15) 16:9 85:3 101:16 112:2 127:2 129:14 134:13 139:21 142:24 178:9 184:10 193:14 194:18 201:23 206:1 helpful (1) 107:17 helping (1) 130:21 helps (1) 72:4 hence (2) 166:4 169:1 here (28) 2:21 21:5.10 28:1 29:11 34:11 42:20 53:24 57:7 64:24 65:5 69:23 82:11 88:19 90:4,6 110:18 121:7 141:5 142:13 144:7 146:2 155:21 162:1 170:22 180:11 183:11 202:3 hi (7) 23:7 51:7,11 56:15 78:19 80:8 96:12 high (3) 13:9 137:2 165:22 higher (2) 6:6 165:13 highlighting (1) 165:7 highpressure (1) 48:11 highrise (2) 149:25 150:17 himself (2) 54:12 55:2 hindsight (1) 192:2 historic (3) 58:12 61:10 hit (3) 150:25 151:14,21 holding (3) 197:14,21 198:5 honestly (1) 179:7 hope (1) 68:6 hoping (2) 85:18,18 horizontal (1) 83:3 horrified (1) 83:7 hour (1) 169:22

94:10,24 95:4,14,16,19 96:16,16,23 115:10 135:1 145:14 146:11 149:16 177:16,18 however (2) 68:1 148:17 hpl (2) 48:8,11 hr (9) 20:18 28:7 29:15 33:23 39:8 40:24 78:17 79:11,17 hybrid (1) 84:18

190:25 203:23 idea (2) 4:13 20:19 ideal (1) 18:8 identical (1) 60:17 identified (2) 35:9 40:1 identify (1) 17:7 ie (3) 49:12,23 50:23 ill (5) 1:21 74:25 106:7 161:24 193:21 im (45) 4:3,17 16:25 19:21 26:14 29:19 34:15 46:2 48:4 55:19 61:19,23 64:10 72:21.21 75:3 84:18 87:18 92:5,13 96:6 97:1 99:8.10 100:15 101:15,17,19 102:9 103:16 108:25 115:1 117:15 120:21 126:11 129:23 145:17 167:6 172:17 183:11 184:12.19.25 193:18 200:18 immediate (1) 191:24 immediately (2) 164:24 206:9 impact (3) 20:24 79:24 87.21 imperfection (1) 185:6 importance (3) 149:5 169:8 188:2 important (4) 35:10 138:10 195:8 207:22 imposed (3) 196:13 197:11,19 impossible (1) 192:8 impression (4) 13:3 24:20 54:3 92:14 inaccurate (1) 142:6 inadequate (1) 191:23 incident (1) 145:23 include (9) 17:1 32:16 50:13 80:25 107:3 116:9,11 117:2 195:19 included (17) 11:11 17:8 24:21 51:15 61:15 67:21 68:1 70:20 89:4 90:6 127:19 130:19 137:23 168:7 176:17 197:12,19 includes (2) 58:23

116:14

house (18) 6:22 7:2

including (15) 80:23

120:25 159:19 169:3,9

178:17 187:22 188:3

190:11,20 192:16,25 196:16 197:2.8 incorporate (1) 186:16 incorporated (1) 198:9 incorporates (1) 184:13 incorrect (1) 118:7 increase (1) 72:14 independent (1) 171:24 independently (1) 200:24 index (1) 209:2 indicated (1) 125:15 indication (1) 157:19 indicative (3) 38:17 39:2,7 individual (2) 127:20 172:5 individuals (2) 130:21 144:16 industry (23) 3:1 10:5,7,10 65:24 118:23 123:3.20 124:4,9 160:20 161:1 163:7 169:7 182:14,25 183:6.12 184:7.12.22 185:21 188:2 industryrelevant (1) 118:19 infer (1) 166:25 inferring (1) 176:1 influenced (1) 21:4 informal (2) 122:12,15 information (28) 8:2 10:22 15:10 20:20 25:13 37:25 42:21 49:14 78:20 79:7 92:2 100:5 101:23 102:10 121:4,6 130:20 137:21 138:6,17,21 139:2 140:4,11,20,21 163:8 200:20 informed (1) 10:21 inherent (1) 78:3 initial (3) 111:24 147:25 157-25 initially (6) 80:14 102:24 111:7.16 114:9 115:3 inn (2) 96:2,17 input (3) 24:14 26:3 64:9 inquiry (12) 1:16,18 2:5 16:5 42:19 63:22 107:14 108:19 109:8,20 209:4,6 insofar (1) 198:10 inspect (1) 199:3 inspection (2) 145:20 148:1 install (2) 38:3 200:16 installation (4) 30:21 88:25 89:5 203:3 installed (1) 113:24 installer (1) 78:8 installing (1) 6:2 instantly (1) 140:19 instead (2) 81:11 82:2 instruct (3) 9:3 49:21,25 instructed (1) 9:2

instructing (1) 9:5

instruction (1) 50:20

instructions (1) 31:13

168:4 176:3,13 insulation (69) 17:2.2.3.7.9.11 30:20 34:2,6 41:11 45:23 88:13.19 89:1,5,8,18,21 90:5,14 91:5,17 97:23 98:13 100:7,8,18 101:2.9.11.22 102:3.7 103:23 104:15 106:15.17.18 107:8 120:16 122:2 145:6,8 150:17,20 156:18 159:18 160:13 162:5 168:10,13,16 177:13 181:15 182:16 183:25 184:1 185:12 188:14 189:4,10,15 190:11 192:16,25 202:22 203:22 206:14 207:1 insulations (3) 189:18,23,25 intact (2) 147:1,11 integrity (2) 185:11 205:1 intended (3) 31:18,21 32:12 intending (1) 169:14 intent (1) 195:3 intention (2) 198:13,20 interesting (1) 85:2 interests (1) 87:2 internal (1) 94:1 internally (1) 59:20 international (1) 113:16 interpret (1) 158:22 interpretation (2) 163:9 interpreting (1) 95:20 interrupt (1) 4:3 into (21) 4:7,8 7:24 15:8 22:1 24:14 26:3 64:9 76:23 88:10 112:6 114:15 126:19 131:19 138:13 146:18 151:14 153:25 178:20 187:6 198:10 introduction (1) 163:20 investigate (1) 19:4 investigations (4) 88:10 107:15 172:9.14 involve (6) 3:18,22 112:12 116:6 131:22 132-19 involved (53) 14:22,24 15:4 25:25 26:1 64:17.20 67:7 76:9 85:22 97:6,14,15 98:3 103:4.10.12 104:4.25 112:2 113:22 116:7 125:3 127:17 128:15 130:2 131:8,20,24 133:20 134:9,23 141:1 143:11,13,14,17,19,20,2 144:5 145:4 146:15,17 148:24 152:11,13 169:12 172:11,12 175:20 199:11 206:17 involvement (18) 11:7,16 13:17 14:19 15:21 16:8 19:8 20:14

insulant (1) 203:4

insulants (5) 167:17,24

24:5,7,9 34:17 45:15 103:7 130:19.24 134:18 136:2 involving (1) 33:11 ireland (2) 180:9,12 irvine (2) 204:8,13 irving (3) 26:10 36:14,22 isnt (11) 4:6,14,21 26:11,17 74:8 80:25 89:9 90:6 174:11 177:5 issued (3) 58:25 160:25 161:4 issues (12) 85:4 115:8 130:11.23 145:1 164:24 166:23 175:22.24 178:21.24 194:2 istephan (1) 4:14 item (4) 16:18 91:6 94:9 202:18 items (17) 35:13 80:23 83:11,12,15 90:2,4,6 91.14 15 94.7 103.12 110:5 142:24 146:25 202:3.7 itll (1) 2:8 its (86) 2:6 3:25 14:9 15:15 19:24 20:22 29:15.25 32:9.14.14 37:13 39:3 40:9.15 43:1 49:3 51:3 52:19 53:18 54:23 55:21 56:9 57:22 58:17 64:3.9.13.13.18 65:14 69:13 71:16 78:5,16 79:3,24 80:1 82:10 86:21 87:2 89:14 90:5 91:12,12 94:1,24 95:15.17.19 101:17 102:7 104:17 107:17 108:9,22 109:11 110:6,10 111:16 112:18 117:15 118:7 120:23 131:18 142:6 146:2 154:24 157:10,20 158:8 161:16 163:7 165:15 174:12 177:15 179:11,17 180:7 183:12 191:15,25 205:23 206:9 207:16,22 itself (7) 48:14 57:5 58-17 85-5 102-14 187:4 200:5 ive (19) 18:25 26:15 27:12 40:25 64:23 80:9 82:25 84:16 85:3 93:23 101:18.24 102:10 105:2.3 141:10 146:20 152:9 175:5

january (22) 28:19 29:25 42:18 43:9 46:6 51:4,20 52:17,21 56:14 57:23 58:21 73:7 88:15 89:13 102:21,24 120:7 145:15,23,24 148:6 jason (1) 100:2

139:6

68:14,23 70:1 71:7

81:15 83:18,23,23

74:19 75:6,20 77:8,21

list (4) 47:17 94:3 146:8

link (1) 51:17

listed (1) 61:16

literally (1) 197:24

literature (3) 97:9

148:8

ict (1) 199:6 job (21) 7:23 8:4,18 9:12 10:21 15:9 21:3 22:4 47:5 73:13 95:21 97:14 99:1 125:17 126:5,5 127:4 143:14,16 201:7,8 jobs (4) 3:18 5:16,19 joined (3) 6:4 142:1 143-15 joints (3) 84:5,5,15 ionathan (6) 94:17 96:1,9,23 120:10 161:22 july (3) 100:2 102:4 103:2 jump (1) 84:13 jumping (1) 22:4 june (13) 80:7 81:14 82:11 134:11,17 136:18 161:8 170:18 173:23 175:14,16 193:12,12

K kai (2) 86:9,10 katie (2) 57:23 66:16 keen (2) 67:23 127:1 keenness (1) 105:4 keep (11) 1:23 10:9,11,21 85:5 109:5 122:16 124:3.8.22 137:16 keeping (7) 44:15 84:6 128:8.10 130:22 132:17 136:9 keepmoat (1) 12:18 kept (4) 44:16 124:12 127:22 138:11 kevin (18) 98:24 99:7 102:24 111:19 112:20 128:19 129:16 130:8,9,10 131:6,18 134:2.6 136:9 141:25 149:20 162:17 key (8) 164:2.11.17.24 166:5,23 175:22,24 kind (10) 34:14 93:22 111:11 121:12 132:12 154:20 168:2 189:24 205:11 207:9 kingspan (1) 103:22 kme (26) 19:20 20:1,7 26:14,16 27:1,19 28:1.4.11 30:2.14 31:3 33:23 36:14 37:5,9,21 39:8 40:24 48:14 68:19.24 69:1 78:11.21 knew (14) 19:12 55:6 83:9 86:19 87:20 121:18 145:3,16 158:4 182:3 191:11,16 201.78 know (147) 7:11 10:12 13:10 15:9.12 16:11,17,22,25

61:12,12,18 66:7,10 67:10 69:19 72:3,8,23 73:2 75:6 76:22 77:25 78:4 79:6 84:15 87:13 88:3.4.7.9 91:13.13 92:4,5,9,18,20,23,24 93:11 99:8.20.21 100:17,17 101:1,2,8,18 102:8,11 104:11.14.25 109:4 111:21 113:9 121:15.19.22 125:22 127:9 128:11 129:17 139:24 140:5 141:25 142:1 144:23,25 145:4.8.11.17 149:18 151:4 154:20 157:15,16 158:22,25 160:23 161:3.17 166:15 174:17 176:11 178:13 179:10.20 182:3.9 183:7 186:2 188:6 191:15 192:18 193:3,3 194:10,10 199:6 206:23 knowing (2) 15:6 145:18 knowledge (11) 8:8 16:11,22 21:21 49:21 69:4 124:3 143:1 174:7,14 182:7

known (8) 55:7 129:2

155:1 159:12 186:5

201:6 202:13,14

45:8,11

47:8.10.17.22.23.24

53:11.16.22 54:25

56:16 58:6 59:1,17,22

48:1 49:19,24

50:6.10.17

launch (2) 93:1,5

launched (1) 92:25

lawrence (12) 57:24

84:22 86:8 87:6

lead (3) 65:9 196:20

leaders (1) 124:20

leads (1) 165:12

learning (1) 182:5

learnt (1) 149:17

137:15 175:5

left (7) 116:13,18

126:11 137:13 139:11

led (1) 55:25

least (3) 42:9 52:12

leaving (4) 126:11,13

207:12

55:25

78:13.16 79:7.9 83:22

66:16 74:3.20

I (1) 117:8 lack (1) 20:20 lady (2) 74:24 109:6 laid (1) 53:3 lamb (11) 98:24 102:24 111:19 112:20 128:19 130:8 131:6 134:2 141:25 149:20 162:17 lambs (1) 130:9 laminate (1) 48:11 laptop (7) 110:5 137:17.23 138:22 139:13 140:16,17 laptops (1) 138:12 large (2) 8:15 204:25 larger (3) 5:22 6:13 91:15 largest (3) 7:9,13 111:17 last (14) 19:20 118:3,13 125:15 128:14 135:8,25 138:4 139:19 142:8 148:9 177:25 183:7 206:7 late (3) 16:3 96:8 102:4 later (17) 21:11 43:16 75:20 99:24 104:3.6 120:3.22 126:3 128:23 130:8 149:23 159:7 161:25 175:15 193:21

194:12 203:23 lefthand (4) 103:13,18 185:2 188:12 legislation (3) 124:23 191:22 192:3 length (1) 165:15 lengthy (1) 89:14 less (6) 8:18 13:7 73:3 81:3 84:8,18 let (6) 15:2 16:10 21:2 23:12 56:16 109:4 lets (15) 14:4 36:12 37:11 57:5 58:17 66:17 67:12 73:16 80:4 81:13 93:18 94:2 139:9 179:9 203:12 letter (2) 58:20 195:3 level (3) 47:22 159:18 188:16 liability (2) 197:12,19 liable (1) 200:9 liaison (1) 142:17 lie (1) 4:13 life (1) 4:7 lifespan (1) 79:5 light (4) 62:10 85:11 104:2,23 like (28) 1:21 3:20.22 5:20,25 10:16,17 32:22 38:24 39:3 63:1 70:6 79:3.23 91:6.14 107:20 123:17 133:8 154:12 159:3 160:5 170:3 175:15 187:9 204:1 207:10 208:1 likely (4) 63:23 64:3,5 155.23 limit (1) 186:17 limited (28) 33:16 113:16 132:23 137:5,14 159:20 160:2.8.14 164:1,11,17 167:18,24 168:6.11.14 171:14 172:5 176:4 180:13,25 181:4,16 188:17 189:5,11 204:19 limiting (1) 54:12 line (10) 106:9 120:13 127:16 134:22 139:10 142.8 144.13 146.3 176:6 183:1 lines (5) 98:14 139:8 148:5 164:10 204:23

182:17 183:15 little (15) 13:16 14:4 21:16 25:3 57:6 86:7 89:22 95:2 128:1 136:20 143:7.16 150:5 152:20 166:22 living (2) 143:7 148:17 load (4) 76:22 206:19 207:4,11 local (1) 205:4 located (1) 148:19 logically (2) 153:18 159:3 london (1) 123:16 long (10) 35:19 101:17 112:16 115:19 132:14 140:23 182:15 183:14 197:17 198:18 look (108) 2:7 4:8 7:22,23 8:1 10:18 13:16 14:5 15:17 17:25 19:14 24:11 25:3 26:9 28:17 29:1 36:17 37:11,15 41:9 43:6 45:3 49:2 50:25 51:2 52:22 56:12 57:5 58:17 60:3 63:2 66:12.17 69:17 70:4 72:4,6 73:16 74:18 76:3 77:6.14 79:3.23 80:4,17,19 82:9 83:17 87:5 88:15 90:1,2 93:18 94:2,5 102:25 107:21 109:12 110:23 120:2.3.6 125:2 132:12 133:18 139:5,7 140:25 141:11 145:20 146:22 148:13,14 154:6.23 158:8.17 159:15 161:5 162:1 170:4.21 173:20 175:23 177:2,9,17 179:9.25 180:1.10 181:6 182:11 184:24 185:3 188:11,25 189:1 190:4 191:18 201:10.22 202:3.17 203:24 204:16 206:5 looked (23) 8:1 11:25 12:9 25:11 36:15 42:15 45:4,12 89:15 90:2,3,23 92:17 95:24 98:4 106:12 117:12.25 136:4 146:16 154:13 191:3 192:14 looking (41) 8:17 13:4 15:18 16:22 22:12 26:23 39:14 40:21 42:18 59:17 64:5.11 67:1 68:14 71:13 85:15 88:16 95:15 98:16 113:14 116:9 132:25 151:7 161-2 12 16 168-2

170:17 173:17 175:14

177:13 183:12 184:1,2

193:1,5,16 201:1

203:8,15 207:8 looks (5) 46:11 55:9 84:4 102:23 159:3 loop (1) 44:15 loose (1) 141:24 lost (2) 140:21 205:2 lot (13) 4:9 7:12 44:20 73:13 120:22 134:14,15 137:1,2 164:21,22 184:19 193-22 lots (4) 87:12,13 189:17.22 lovell (2) 146:3 152:14 low (2) 81:21 166:6 lower (4) 20:4 21:16 165:13 205:17

m (1) 25:6 m2 (4) 19:22 22:20 38:4 100:7 magazine (1) 10:16 main (25) 3:16 11:10.19 12:7,10,22 13:3,22 25:8 37:1,6 40:4 56:16 57:10 58:2 65:7 66:22 86:11 110:23 141:11 173:20 181:9 196:20 198.8 199.3 mainly (3) 33:16 112:7 153:1 maintain (2) 8:14 maintained (1) 200:22 maintenance (1) 149:9 major (1) 125:12 majority (1) 136:24 makes (1) 77:8 making (5) 83:24 86:16 128:9 174:10 196:8 manage (4) 75:4,13 119:19 131:3 management (2) 124:6 173:6 manager (30) 25:24 115:13 119:18,19 125:6,9,12,17,20,22 126:1.2.5.10.16.21.24 127:3,17 128:2 130:18 131:24.24 134:11 143:24 144:13 173:4 195:8,12 managers (1) 128:10 managing (6) 75:10 130:19,20 131:21 135:3 137:16 manufacture (2) 42:4,7 manufactured (5) 53:7,10,25 55:10 manufacturer (2) 88:22 111:3 manufacturers (14) 38:16.22 39:6 40:17 41:8 74:9 91:1 98:6 145:4 154:16 175:6 176:23 182:17 183:15

many (8) 6:18 12:9

20:22 83:11 101:18

132:13 182:20 199:10

march (8) 66:14 76:10 109:21 135:2 137:14 138:5 179:11 193:9 margin (1) 8:15 mark (71) 6:15 7:23 9:4 14:6,16 15:5,7,12 16:5,13 18:2 19:12,15 20:10 21:11 22:10,12,13 23:6,7 27:10 31:14 32:1 41.20 43.20 44.2 46.7 47:14 49:9,21 50:7 56:13 57:9.12 58:14 66:13 67:13,15,20 68:14,23 70:1 71:7 74:19 75:20 77:8 81:15 83:18,23,23 84:23.25 86:2.6.8 87:6 92:9 96:13 133:8.25 134:1 144:13 148:10 173:9,9 177:7,25 193:20.25 194:15.16 market (1) 151:14 markup (1) 30:23 martin (37) 1:5,13 4:3,8,12,17,25 62:18.22 63:1.8.10 105:6,9,17,20 106:2 107:16,20,23 108:2,6,8,10,12 117:15.19.22 169:20 170:3,6,12,14 204:4 207:16 208:1.6 matched (1) 87:8 material (19) 3:15,21 18:13 24:7 31:16 41:12 59:20 66:2 69:7 79:7 88:21 93:7 100:8 159:18 164:22 188:12 189:4 191:1 192:25 materials (43) 3:14.23 5:24 6:1 31:6 34:8 38:5 41:3,14 64:25 65:1,8,21 66:9 113:12 116:21 119:5.9 121:17 144:23 155:25 156:8 161:7 163:22 164:1,10,16 165:2 166:6.18 171:14 180:4.12.19 181:1.13 188:15 192:7,16 204:18.19 206:14 207:2 matters (3) 38:13 99:17 194:7 matthew (2) 26:10 36:14 maximum (1) 76:4 maybe (4) 46:20 48:7 72:21 128:11 maynard (3) 80:5.6 81:14 mc (1) 95:11 mean (23) 32:13 39:18 46:25 57:17 62:4 70:3 73:13 90:7 106:16 119:1 129:3 131:8 132:12 134:1 135:10,10,11 154:22 174-15 184-11 13 192:17 195:22

meant (9) 27:22 126:20 139:18.19 159:12 160:5 164:17 167:12 199:16 measure (3) 3:13 101:5 167:1 measured (1) 58:11 measurement (1) 100:21 measurements (2) 59:22.25 measures (2) 8:11 71:24 mechanical (1) 111:2 medium (2) 155:23 meet (14) 131:25 132:4 151:23 156:15.16.24.25 158:13 160:10 167:18.24 176:14 197:25 198:4 meeting (22) 15:14 68:6 94:10,12,17,18 95:13,25 96:5 97:4 104.9 152.8 17 157.11 167:20 168:1 176:3,17 177:22 178:3.6.7 meetings (4) 94:3 123:15 178:10 179:3 melt (3) 205:5,19 207:7 melted (1) 147:3 melting (2) 205:12,17 member (7) 123:3,6,8,13,23 177:4 193:15 members (7) 123:15 163:7 177:22 178:3,7,9 179:3 membership (2) 177:6 memory (6) 12:23 54:18 60:20 64:18 111:14 146:18 mention (1) 4:6 mentioned (6) 115:22 122:5 136:13 138:25 168:9 182:6 mentioning (1) 184:14 merit (2) 177:16,18 message (1) 26:20 met (7) 50:16 153:11 158:6 172:1 177:21 182:18 183:16 met00064867 (1) 110:10 metal (6) 9:10 204:23 205:2,5,11,13 metallic (2) 42:22 43:1 metallicfauxzinc (1) 18:14 method (1) 88:11 methods (1) 97:24 metre (7) 21:18.20 60:17,18 73:12 91:17 101:13 metreage (2) 100:25 102:1 metres (10) 7:3 41:6 100:21 158:3,5 171:16 181-13 189-20 24

201:10

17:10.10.11 18:16.25

23:12,13,13,23 27:3

41:19.22 42:6 44:19

32:18 37:5 40:16

19:5.6 20:6

192:19

means (3) 3:20 39:16

139:24

metropolitan (1) 110:8

middle (5) 30:8 37:15

96:2,8 104:9 109:11

114:6

59:6 103:2 146:22
midjuly (1) 102:4 might (15) 23:17 48:8
71:14,19 85:3 87:21
103:9 121:22 138:9 139:19 142:24 157:19
167:10 190:21 207:10
mike (9) 1:10,12 49:7
63:25 64:8 94:23 95:7 96:18 209:3
millett (21) 1:8,9,15,17
4:3,6,15,20,24 5:2 62:16,18 63:11,12
105:1,8 106:3,4
107:11,23 108:1 million (3) 30:13,17
73:8
millionodd (3) 30:14,25 59:9
mind (8) 55:1 75:17
98:20 106:20 150:19
168:10,16 183:23 mine (1) 4:14
mineral (5) 34:21
189:6,12,14,20 minimised (2) 81:24
85:19
minute (1) 165:8
minutes (4) 19:23 105:6 204:3,5
mirrors (1) 165:6
misleading (4) 173:24 174:6,13,16
misspelt (1) 95:12
mistake (1) 80:14 mix (1) 76:23
modified (1) 177:25
module (7)
116:14,17,23 117:11,24 118:12,13
molten (2) 205:5,13
moment (10) 42:15 62:16 67:18 71:19
72:17 115:1 162:6
169:19 206:6 207:15
monday (3) 1:1 68:7 145:23
money (1) 8:18
monitoring (1) 137:6 months (2) 114:5
139:12
moorebick (37) 1:5,13 4:3,8,12,17,25
62:18,22 63:1,8,10
105:6,9,17,20 106:2
107:16,20,23 108:2,6,8,10,12
117:15,19,22 169:20
170:3,6,12,14 204:4 207:16 208:1,6
more (50) 1:6 5:24
7:4,23 13:7,9,11,16
14:4 21:2 22:20 25:4 26:1 35:10 57:1,2,6,19
58:19 63:23 64:3,5
71:14 72:19 73:2,11,14 74:7 76:22
81:20 88:1 91:16
105:14 106:3 116:21
120:4,22 121:19 128:1 129:11 133:8 152:20
159:17,24 161:25
176:5 177:13 186:12

```
188:16 207:20
                           near (1) 6:23
morning (12) 1:5,9,17
 19:19 22:13 45:4 49:7
  51:12.20 59:6 62:4
most (8) 41:22 42:18
 47:21 80:20 91:8
 135:4,8,23
mostly (1) 84:14
mouth (1) 129:18
move (3) 29:16,17
moved (1) 113:15
moving (5) 114:6
 126:19 128:11 134:15
ms (14) 4:14
 108:6,7,9,18,20
 117:23 169:17
 170:15.16 203:24
 204:6 207:15 208:8
msc (10) 114:25
 115:5,25 116:2,6,14
 118:4,24 179:20
 203-19
much (30) 1:13,17 4:25
 6:6 8:11 9:2 22:20
 24:5.7 62:19 71:17
 76:18,24 91:17 100:17
 102:8 107:12,15
 108:1.12.21.22 113:2
 119:20 120:3 160:6
 170:6 178:21 191:10
 205:17
muirie (2) 33:16 71:2
mulalley (1) 12:17
multi (2) 156:18 202:22
multistorey (3) 122:3
 203:22 204:9
must (4) 19:23 79:14
 90:8 174:12
myself (9) 27:24 44:3
 57:8 59:24 69:20
 75:24 85:14 99:24
mystery (1) 19:25
name (6) 6:21,25 146:7
 148:9 176:23 177:19
names (2) 12:11 146:2
narrowed (1) 50:11
national (3) 159:5,7
 167-11
natural (6) 74:8 76:5
 84:3.7 87:8 117:16
nature (6) 13:4 119:7
 163:13 166:8 191:24
nbs (52) 7:16 8:20 9:1
 11:11,23 12:2 13:13
 14:13 21:7 23:4
  24:13,22 26:8 27:4,12
 32:8 36:12,18,21
 37:4,8,11 38:25
  42:15,16 50:9
```

75:22

186:6

128:4

195:9

51:13.15 52:6.8 53:12

54:5 60:10 61:17 62:1

99:14,19,20,23 102:13

79:22 88:14 89:8

90:22 92:16 93:8

201:4,8,10,12,21

197:3

```
necessarily (2) 23:13
 202:14
necessary (7) 10:21
 124:1 149:10 166:7
  169:16 186:15 192:10
nedzink (6)
 18:8,10,19,23 19:4
  78:18
need (25) 7:15 18:9
  23.12 25.17 27.11 19
  36:20 48:16 73:20
  77:10 80:12 86:16
  108:15 109:3 129:6
  132:1,6,9,14 166:4
  177:10 184:24 185:24
  202:7,11
needed (16) 3:14 25:12
 27:22 28:7 32:23
  83:12 115:9 132:2.4
  156:11 169:11 186:23
  187:11 190:2
  202:13,15
needing (1) 124:22
needs (1) 105:10
negative (1) 90:6
never (12) 33:25 93:23
 124:8 139:23 141:10
  147:15 152:9 164:18
  183:23 184:4 196:10
 199-12
nevertheless (1) 65:2
newham (1) 143:7
news (5) 10:11,12,14,16
 74:6
next (9) 60:3 79:23
  107:25 108:8
 120:18,20 156:14
 185:13 204:2
night (2) 96:8 145:14
nobody (2) 45:21 47:16
nod (3) 2:1,3 117:16
nods (2) 117:13 153:4
noncombustible (3)
 180:13.25 204:18
none (2) 67:23 193:24
nonetheless (1) 57:2
nonfire (1) 35:4
nonstandard (4)
 42:23.25 43:2.4
nor (1) 203:3
normal (3) 13:8,10 47:4
normally (4) 9:3 13:11
  39:16 129:13
northern (2) 180:9,12
note (12) 38:22 75:23
  109:7 161:6 162:1,10
  163:4 173:23 174:6
  179:11 185:1 187:16
noted (2) 38:16 39:6
notes (6) 36:7 94:17
 161:3 162:4 163:6
 179:6
nothing (3) 17:5 75:3
 113:25
notify (1) 196:14
nova (1) 18:14
november (25) 2:6
 14:7,17 15:5 16:3
  19.16 21.11
  22:11,12,13 23:25
  27:2 36:20 37:12,17
```

42:17 94:6,9,19 95:14

ongoing (2) 119:16,25

```
number (9) 13:21 24:6
 25:7 36:16 43:8 61:6
 94:7 103:1 141:14
numbers (1) 17:9
          0
obtain (1) 55:18
obtained (6) 23:23
 26:25 58:12 59:20
 115:2,25
obtaining (3) 20:6 25:4
 76:11
obvious (1) 66:23
obviously (18) 8:10
 17:4 26:3 32:19 40:16
  47:1 48:10 51:21
 54:10 55:9 60:11
  64:19 75:16 78:5,7,8
 91:16 101:25
occur (3) 35:9 44:8
 68:13
occurred (2) 145:13
 178:9
oclock (5) 107:25 108:2
 207:21 208:2,6
october (17) 5:9,10 6:5
  15:16 16:6 18:1,25
 19:7 45:5 63:16,19
 64:16 135:1.2 177:24
  178:1,4
odd (3) 50:11 54:2
 102:2
offer (8) 23:9
 49:11.22.25 50:19
 58:23 81:6 192:8
offered (4) 50:5 173:24
 174:18 175:2
offering (4) 70:12 73:5
 74:16 76:4
office (2) 128:7 137:4
offices (1) 94:18
official (4) 130:4,5
 192.4 12
offline (1) 177:10
often (4) 130:25 136:3
 175:8 186:15
oh (1) 4:12
oil (2) 113:21,21
okay (37) 5:18 16:21
 23:22 24:4 29:22
  42:13 45:21 46:5.10
  47:15 62:21.25 64:7
  80:17 86:24 93:17
 95:10.18.23 103:20
  105:19 107:11,19
 123:19 140:24,25
 142:8 144:4 145:18
  149:13 152:4 160:18
 167:14 169:17 184:6
 191:17 204:2
omit (1) 104:15
omitted (3) 80:22 83:1
 104:12
omitting (1) 83:11
once (7) 65:7 86:24
  104:17 140:19 152:13
  169:1 206:17
ones (8) 7:13 47:25
  142:22 143:13 165:13
 169:16 185:25 187:12
```

onthewall (1) 31:1
open (1) 174:7
openings (5) 169:4,9
187:23 188:4,6
opinion (4) 39:11 85:21
106:21 171:25
opinions (2) 127:9
174:12
opportunity (2) 105:11
199:3
opposed (4) 27:15
55:12 81:8 168:21
optimum (1) 85:23
option (13) 19:4 69:3
82:6 170:24,24,25
171:14,18,23 172:8,13
174:1,1
optional (1) 116:14
options (25) 19:1 21:8
22:17 24:17 60:4
61:16,25
66:15,18,21,22,24
67:8,21 68:1,9 71:23
73:15 76:10,16 84:15
170:23 171:4 172:23
173:2
order (13) 3:18 8:8
11:13 25:14 26:21
27:10,20 32:3 58:9
86:12 112:23
135:12,15
ordered (3) 34:8
135:13,21
ordering (2) 135:16,20
ordinarily (1) 7:14
organisation (3) 5:22
113:19 118:23
original (5) 71:25 76:5
80:22 82:15 103:25
originally (4) 82:16
102:12 141:13,20
others (8) 12:25 46:18
87:17 94:4 96:9 105:4
119:20 171:7
otherwise (3) 9:2,3,6
ought (2) 105:12 196:20
outline (2) 15:13 45:5
outside (7) 40:14 77:16
186:13 187:4 191:8
206:20 207:5
outsourcing (1) 113:7
over (23) 14:9 22:20
23:19 33:10 47:18
51:4 70:6,25 80:18
102:7 105:4 125:4
127:1 148:18 155:10
180:1 181:13 182:12
187:20 189:19,24
192:19 204:22
overall (2) 206:19
207:11
overcladding (5) 49:11
53:3,5 144:6 201:18
overheads (1) 30:23
overrestrictive (1) 55:2
overseeing (1) 144:12
own (10) 16:11,22 56:7
85:16 87:2
124:16,17,21 142:3
182:22
oxygen (1) 165:15
Р

**p1 (4)** 103:12,13,19,21 **p2 (3)** 103:12,14,22 package (10) 11:19 12:7.17 13:2 24:14 58:24 66:21 90:9 100:6.18 packages (1) 12:9 pages (3) 50:25 110:11 204:16 paint (1) 67:25 painted (1) 84:8 panel (14) 18:15,23 19:22 20:1,2,7 28:7,10,17 38:10 48:8 79:17 204:18 206:25 panels (39) 29:6,13.15 30:6,10,18 34:13.18.22 37:21 43:7.11.11 46:8 48:2,5,6,7 53:7,25 55:10,12,13 62:11 81:7.10 84:8 103:13,14,21 145:1,2,11 204:23 205:2.11 206:9.11.17 paper (1) 146:25 paragraph (81) 11:5 12:14 13:19 18:5 25:2,5 27:8 31:10 33:7 36:17 41:25 52:23 53:4 57:7 58:22 63:13 64:23 67:20 70:24 74:5 75:1 77:9 81:17 86-11 87-9 97:18,20,21 98:8,14 99:11 110:23.25 111:6 112:14 113:14 115:22 120:18,20 121:11 125:2 127:15 128:14 130:14 131:7 134:8,21 135:25 137:12 138:20 139:7 141:11 146:23 148:14 155:18 156:14 158:8 159:16 162:2 163:5 166:23 167:16,20 170:24 173:21.25 174:19 175:3,24 176:17 181:6 182:11.11 186:10 188:13 189:1 191:18 203:1 206:7,7 207:9 paragraphs (2) 114:4 156:16 parenthesis (1) 176:5 part (37) 24:13 31:20 33:5 35:24 37:8 59:1,5 89:1 90:9 99:15 115:11 117:8,10,12,25 119:21 126:5 127:4 133:12 139:19 141:3 146:6 151:22 153:21,25 166:14 168:7 172:11 176:5.18 192:11 193:24 195:5 196:25 199:12 201:5 202:10 particular (26) 8:4 10:15 18:20 31:23 32:2,25 33:12,20,22 37.6 45.24 70.6 89.23 91:14 98:19 107:4 116:8 119:5 127:18

166:16 182:16 200:7.10 particularly (12) 24:15,20 35:11 47:6 56:22 76:15 79:8 91:1 97:15 166:7 186:12,21 parts (9) 117:4,5,7 153:19,25 154:15 168:1 180:20 195:14 pass (6) 133:2,4 154:17 188-23 194-9 200-20 passage (2) 64:14 185:8 passed (3) 74:14 122:7 162:14 passing (8) 41:7 103:9 121:3.8.9 133:6 134:6 157:14 past (5) 13:12 129:16 140:16 152:13 157:21 pasted (1) 191:11 pause (8) 4:16,23 63:3 105:22 120:11 170:7 180:6 208:5 pausing (1) 135:8 pe (7) 33:19 34:14 35:2,5 44:24 81:7 87.25 peeping (1) 180:7 penetration (1) 185:16 people (16) 4:9,18 111:16 122:5 129:12 130:6 133:2.5.8 144:12 147:13 156:10 161:2,12 163:1 183:5 peoples (1) 130:1 per (9) 21:9,18,20 22:20 38:4 60:17,18 74:12 101:13 perform (3) 40:23 126:2,3 performance (40) 35:11 39:17,18,20 40:3 87:22 88:5,11 106:19,24 107:3,9 113:12 116:11,20,25 119:9 122:2 127:10 150:13.19.22.23 151:7,8,11,21,23,25 152:1 153:17 156:16.17.25 157:2.12 179:12 189:16 201:17 performances (1) 40:19 perhaps (6) 44:20 72:5 77:1 84:17 125:23 136-19 period (5) 5:15 125:5 132:1,2 134:10 periods (2) 132:6,7 person (3) 98:19 114:19 129:6 personally (3) 123:12.12 179:5 perspective (2) 32:16 82:5 phenolic (1) 168:5 phenomenon (1) 205:11 photograph (1) 146:23 phrase (3) 39:14 160.2 10

phrasing (1) 40:9

pick (4) 139:9 148:15

picasa (1) 84:1

128:12 144:16 151:23

166:22 204:22
picked (1) 84:7
picture (2) 204:8,11
piece (2) 161:5 206:6
pieces (1) 204:25
pir (6) 88:21 168:4
176:13,24 192:16,25
place (3) 75:23 83:10 200:13
placed (1) 119:4
places (1) 28:20
plain (1) 19:3
planners (2) 84:12,20
plastic (1) 206:12
play (1) 31:20
played (2) 86:2 149:3
plays (1) 85:5
please (74) 1:10,10,23 2:2,3,9,12,25 11:5
13:18 14:5 17:25
19:14 21:10 22:9
25:2,4 26:9 28:18
29:10 31:9 33:8
36:13,13 37:14 42:1
43:7 45:3 49:3,9,13
51:13,18 55:3 57:5
62:22,23 63:13 66:12,18 69:18 70:23
74:2,18 78:12,20 80:4
81:13 83:17 86:5
88:18 89:13 93:19
94:16,23 96:7 97:19
100:1,4 102:23
105:14,17,20 108:2,25
109:3,5 117:19 169:24
170:8 185:3 194:18
207:20,21
pleasure (1) 52:25
plus (1) 30:23
plus (1) 30:23 pm (7) 105:24 106:1
plus (1) 30:23 pm (7) 105:24 106:1 108:3,5 170:9,11
plus (1) 30:23 pm (7) 105:24 106:1 108:3,5 170:9,11 208:9 pointed (1) 152:14 points (2) 133:4 167:15
plus (1) 30:23 pm (7) 105:24 106:1 108:3,5 170:9,11 208:9 pointed (1) 152:14 points (2) 133:4 167:15 police (1) 110:8
plus (1) 30:23 pm (7) 105:24 106:1 108:3,5 170:9,11 208:9 pointed (1) 152:14 points (2) 133:4 167:15 police (1) 110:8 polyisocyanurate (5)
plus (1) 30:23 pm (7) 105:24 106:1 108:3,5 170:9,11 208:9 pointed (1) 152:14 points (2) 133:4 167:15 police (1) 110:8 polyisocyanurate (5) 168:5 176:7,13,20
plus (1) 30:23 pm (7) 105:24 106:1 108:3,5 170:9,11 208:9 pointed (1) 152:14 points (2) 133:4 167:15 police (1) 110:8 polyisocyanurate (5) 168:5 176:7,13,20 192:16
plus (1) 30:23 pm (7) 105:24 106:1 108:3,5 170:9,11 208:9 pointed (1) 152:14 points (2) 133:4 167:15 police (1) 110:8 polyisocyanurate (5) 168:5 176:7,13,20 192:16 polystyrene (1) 176:8
plus (1) 30:23 pm (7) 105:24 106:1 108:3,5 170:9,11 208:9 pointed (1) 152:14 points (2) 133:4 167:15 police (1) 110:8 polyisocyanurate (5) 168:5 176:7,13,20 192:16
plus (1) 30:23 pm (7) 105:24 106:1 108:3,5 170:9,11 208:9 pointed (1) 152:14 points (2) 133:4 167:15 police (1) 110:8 polyisocyanurate (5) 168:5 176:7,13,20 192:16 polystyrene (1) 176:8 polyurethane (2)
plus (1) 30:23 pm (7) 105:24 106:1 108:3,5 170:9,11 208:9 pointed (1) 152:14 points (2) 133:4 167:15 police (1) 110:8 polyisocyanurate (5) 168:5 176:7,13,20 192:16 polystyrene (1) 176:8 polyurethane (2) 167:17 176:7 port (1) 25:22 posed (1) 203:21
plus (1) 30:23 pm (7) 105:24 106:1 108:3,5 170:9,11 208:9 pointed (1) 152:14 points (2) 133:4 167:15 police (1) 110:8 polyisocyanurate (5) 168:5 176:7,13,20 192:16 polystyrene (1) 176:8 polyurethane (2) 167:17 176:7 port (1) 25:22 posed (1) 203:21 position (6) 68:16 69:14
plus (1) 30:23 pm (7) 105:24 106:1 108:3,5 170:9,11 208:9 pointed (1) 152:14 points (2) 133:4 167:15 police (1) 110:8 polyisocyanurate (5) 168:5 176:7,13,20 192:16 polystyrene (1) 176:8 polyurethane (2) 167:17 176:7 port (1) 25:22 posed (1) 203:21 position (6) 68:16 69:14 98:15 99:3 112:15
plus (1) 30:23 pm (7) 105:24 106:1 108:3,5 170:9,11 208:9 pointed (1) 152:14 points (2) 133:4 167:15 police (1) 110:8 polysiocyanurate (5) 168:5 176:7,13,20 192:16 polystyrene (1) 176:8 polyurethane (2) 167:17 176:7 port (1) 25:22 posed (1) 203:21 position (6) 68:16 69:14 98:15 99:3 112:15 155:12
plus (1) 30:23 pm (7) 105:24 106:1 108:3,5 170:9,11 208:9 pointed (1) 152:14 points (2) 133:4 167:15 police (1) 110:8 polysiocyanurate (5) 168:5 176:7,13,20 192:16 polystyrene (1) 176:8 polyurethane (2) 167:17 176:7 port (1) 25:22 posed (1) 203:21 position (6) 68:16 69:14 98:15 99:3 112:15 155:12 positive (1) 24:5
plus (1) 30:23 pm (7) 105:24 106:1 108:3,5 170:9,11 208:9 pointed (1) 152:14 points (2) 133:4 167:15 police (1) 110:8 polyisocyanurate (5) 168:5 176:7,13,20 192:16 polystyrene (1) 176:8 polyurethane (2) 167:17 176:7 port (1) 25:22 posed (1) 203:21 position (6) 68:16 69:14 98:15 99:3 112:15 155:12 positive (1) 24:5 positively (2) 90:8
plus (1) 30:23 pm (7) 105:24 106:1 108:3,5 170:9,11 208:9 pointed (1) 152:14 points (2) 133:4 167:15 police (1) 110:8 polysiocyanurate (5) 168:5 176:7,13,20 192:16 polystyrene (1) 176:8 polyurethane (2) 167:17 176:7 port (1) 25:22 posed (1) 203:21 position (6) 68:16 69:14 98:15 99:3 112:15 155:12 positive (1) 24:5
plus (1) 30:23 pm (7) 105:24 106:1 108:3,5 170:9,11 208:9 pointed (1) 152:14 points (2) 133:4 167:15 police (1) 110:8 polyisocyanurate (5) 168:5 176:7,13,20 192:16 polystyrene (1) 176:8 polyurethane (2) 167:17 176:7 port (1) 25:22 posed (1) 203:21 position (6) 68:16 69:14 98:15 99:3 112:15 155:12 positive (1) 24:5 positively (2) 90:8 195:22
plus (1) 30:23 pm (7) 105:24 106:1 108:3,5 170:9,11 208:9 pointed (1) 152:14 points (2) 133:4 167:15 police (1) 110:8 polyisocyanurate (5) 168:5 176:7,13,20 192:16 polystyrene (1) 176:8 polyurethane (2) 167:17 176:7 port (1) 25:22 posed (1) 203:21 position (6) 68:16 69:14 98:15 99:3 112:15 155:12 positive (1) 24:5 positively (2) 90:8 195:22 poss (1) 75:3
plus (1) 30:23 pm (7) 105:24 106:1 108:3,5 170:9,11 208:9 pointed (1) 152:14 points (2) 133:4 167:15 police (1) 110:8 polyisocyanurate (5) 168:5 176:7,13,20 192:16 polystyrene (1) 176:8 polyurethane (2) 167:17 176:7 port (1) 25:22 posed (1) 203:21 position (6) 68:16 69:14 98:15 99:3 112:15 155:12 positive (1) 24:5 positively (2) 90:8 195:22 poss (1) 75:3 possible (12) 4:8 8:15 18:12 29:9 54:23 55:21 56:25 69:13
plus (1) 30:23 pm (7) 105:24 106:1 108:3,5 170:9,11 208:9 pointed (1) 152:14 points (2) 133:4 167:15 police (1) 110:8 polyisocyanurate (5) 168:5 176:7,13,20 192:16 polystyrene (1) 176:8 polyurethane (2) 167:17 176:7 port (1) 25:22 posed (1) 203:21 position (6) 68:16 69:14 98:15 99:3 112:15 155:12 positive (1) 24:5 positively (2) 90:8 195:22 poss (1) 75:3 possible (12) 4:8 8:15 18:12 29:9 54:23 55:21 56:25 69:13 71:16 86:17,21 104:17
plus (1) 30:23 pm (7) 105:24 106:1 108:3,5 170:9,11 208:9 pointed (1) 152:14 points (2) 133:4 167:15 police (1) 110:8 polyisocyanurate (5) 168:5 176:7,13,20 192:16 polystyrene (1) 176:8 polyurethane (2) 167:17 176:7 port (1) 25:22 posed (1) 203:21 position (6) 68:16 69:14 98:15 99:3 112:15 155:12 positive (1) 24:5 positively (2) 90:8 195:22 poss (1) 75:3 possible (12) 4:8 8:15 18:12 29:9 54:23 55:21 56:25 69:13 71:16 86:17,21 104:17 possibly (13) 6:20 7:11
plus (1) 30:23 pm (7) 105:24 106:1 108:3,5 170:9,11 208:9 pointed (1) 152:14 points (2) 133:4 167:15 police (1) 110:8 polysiocyanurate (5) 168:5 176:7,13,20 192:16 polystyrene (1) 176:8 polyurethane (2) 167:17 176:7 port (1) 25:22 posed (1) 203:21 position (6) 68:16 69:14 98:15 99:3 112:15 155:12 positive (1) 24:5 positivel (2) 90:8 195:22 poss (1) 75:3 possible (12) 4:8 8:15 18:12 29:9 54:23 55:21 56:25 69:13 71:16 86:17,21 104:17 possibly (13) 6:20 7:11 8:20 18:3 26:23 38:24
plus (1) 30:23 pm (7) 105:24 106:1 108:3,5 170:9,11 208:9 pointed (1) 152:14 points (2) 133:4 167:15 police (1) 110:8 polysiocyanurate (5) 168:5 176:7,13,20 192:16 polystrene (1) 176:8 polyurethane (2) 167:17 176:7 port (1) 25:22 posed (1) 203:21 position (6) 68:16 69:14 98:15 99:3 112:15 155:12 positivel (1) 24:5 positively (2) 90:8 195:22 poss (1) 75:3 possible (12) 4:8 8:15 18:12 29:9 54:23 55:21 56:25 69:13 71:16 86:17,21 104:17 possibly (13) 6:20 7:11 8:20 18:3 26:23 38:24 41:18 85:21 87:3,15
plus (1) 30:23 pm (7) 105:24 106:1 108:3,5 170:9,11 208:9 pointed (1) 152:14 points (2) 133:4 167:15 police (1) 110:8 polyisocyanurate (5) 168:5 176:7,13,20 192:16 polystyrene (1) 176:8 polyyrene (1) 176:8 polyurethane (2) 167:17 176:7 port (1) 25:22 posed (1) 203:21 position (6) 68:16 69:14 98:15 99:3 112:15 155:12 positivel (1) 24:5 positivel (2) 90:8 195:22 poss (1) 75:3 possible (12) 4:8 8:15 18:12 29:9 54:23 55:21 56:25 69:13 71:16 86:17,21 104:17 possibly (13) 6:20 7:11 8:20 18:3 26:23 38:24 41:18 85:21 87:3,15 99:7 101:5 102:7
plus (1) 30:23 pm (7) 105:24 106:1 108:3,5 170:9,11 208:9 pointed (1) 152:14 points (2) 133:4 167:15 police (1) 110:8 polysiocyanurate (5) 168:5 176:7,13,20 192:16 polystrene (1) 176:8 polyurethane (2) 167:17 176:7 port (1) 25:22 posed (1) 203:21 position (6) 68:16 69:14 98:15 99:3 112:15 155:12 positivel (1) 24:5 positively (2) 90:8 195:22 poss (1) 75:3 possible (12) 4:8 8:15 18:12 29:9 54:23 55:21 56:25 69:13 71:16 86:17,21 104:17 possibly (13) 6:20 7:11 8:20 18:3 26:23 38:24 41:18 85:21 87:3,15
plus (1) 30:23 pm (7) 105:24 106:1 108:3,5 170:9,11 208:9 pointed (1) 152:14 points (2) 133:4 167:15 police (1) 110:8 polyisocyanurate (5) 168:5 176:7,13,20 192:16 polystyrene (1) 176:8 polyurethane (2) 167:17 176:7 port (1) 25:22 posed (1) 203:21 position (6) 68:16 69:14 98:15 99:3 112:15 155:12 positivel (1) 24:5 positively (2) 90:8 195:22 poss (1) 75:3 possible (12) 4:8 8:15 18:12 29:9 54:23 55:21 56:25 69:13 71:16 86:17,21 104:17 possibly (13) 6:20 7:11 8:20 18:3 26:23 38:24 41:18 85:21 87:3,15 99:7 101:5 102:7 potential (10) 11:10
plus (1) 30:23 pm (7) 105:24 106:1 108:3,5 170:9,11 208:9 pointed (1) 152:14 points (2) 133:4 167:15 police (1) 110:8 polyisocyanurate (5) 168:5 176:7,13,20 192:16 polystyrene (1) 176:8 polyurethane (2) 167:17 176:7 port (1) 25:22 posed (1) 203:21 position (6) 68:16 69:14 98:15 99:3 112:15 155:12 positive (1) 24:5 positively (2) 90:8 195:22 poss (1) 75:3 possible (12) 4:8 8:15 18:12 29:9 54:23 55:21 56:25 69:13 71:16 86:17,21 104:17 possibly (13) 6:20 7:11 8:20 18:3 26:23 38:24 41:18 85:21 87:3,15 99:7 101:5 102:7 potential (10) 11:10 12:1,10,22 13:3,21

pounds (1) 29:2 practical (2) 154:21 185:21 practice (11) 10:7 65:24 91:12 112:3 163:8 182:7,14,25 183:12 184:7,22 practised (1) 191:16 precise (1) 72:22 precisely (1) 207:9 precontractual (1) predicament (2) 85:3.6 predominantly (2) 6:5 11:17 prefer (1) 75:2 preference (3) 20:21 21:5 87:11 preferred (1) 79:20 preliminaries (1) 38:14 premier (5) 94:10 95:19 96:2.16.17 prenbs (1) 13:17 prepare (1) 56:21 prepared (7) 6:14 7:18 15:13 84:15,16 89:12 105.3 preparing (1) 15:22 prescriptive (4) 13:7 151:9,17 157:22 present (3) 104:8 156:1.8 presented (1) 66:20 preserved (1) 138:17 press (1) 74:6 pressure (3) 56:24 57:3 164:21 pretty (4) 8:11 9:2 29:19 191:10 prevent (1) 206:16 prevented (2) 147:1.11 preventing (1) 149:3 previous (14) 7:12 29:8 34:12 47:21 81:19 91:6 92:7,12 126:10 141:1 143:4 150:9,17 194:1 previously (7) 27:9 33:13 34:18 52:2 73:24 74:11 166:20 price (28) 7:14 8:9 11:2 15:9 21:3 25:15 27:1 29:2.4 30:25 31:1 32:1 42:22 47:11 48:21 56:19 61:22 68:20 69.1 70.10 11 74.10 77:16 81:15 89:4 91:4,11,23 priced (2) 101:18 102:11 prices (33) 3:15,21 17:1 21:21,23,24,25 27:9 28:4 47:3 58:12.12 59:19 60:7,13,16,19 61:8 62:9 70:14 71:20,22 73:1,5,6,18 77:10,21,25 78:3 91:5,13,18 pricing (15) 3:18 14:7 20.10 21.4 9 15 24.2

29:7 33:11 37:20 44:6

83:4 101:10,18 103:12

primarily (2) 178:20

profile (2) 141:6,11

profit (1) 8:15

179:19 printed (1) 23:18 prior (7) 12:8 36:22 126:10 134:18 137:15 149:25 150:20 proactive (1) 24:7 probably (42) 7:13 12:12 13:9 14:21 16:2,13,14,15,20 17:21 25:23 31:24 36:23 40:9 41:20 46:19 50:1 52:14 55:6 60:20 64:13.14.19 70:15,17 77:4 78:25 98:25 107:4,24 111:17 115:15 118:12,12,13,25 129:9.25 134:15 154:15 157:24 199:13 problem (1) 4:13 problems (1) 137:1 proceedings (1) 1:3 process (6) 9:17 58:6,9 129:13 151:19 200:13 produce (1) 11:8 produced (7) 57:8 122:3 143:1 179:6.10 181:11 201:16 producing (2) 67:7 112:7 product (70) 9:10 17:2,8,11 30:21 32:2.25 35:7 39:3.19 40:4.10.11.14 47:24 48:17 50:12 53:17.18.23 54:10,14,18 56:8 59:15 61:15 66:5 68:9 70:1 72:19 73:3 75:14 76:11,15 78:6,11 79:11.12.17 88:23 89:5,17,24 90:11,14,16 92:1,3,24 93:1 98:6,17 99:12 102:8.12 106:10,15,17,18 107:5 150:17.24.25 151:10,15,23 159:18 160:13 178:12 181:15 products (61) 6:2 8:19 9:13,16,18 16:23,24 17:3.17.23 24:15.18.25 26:7 31:21 33:13,14,20,23 34:12 35:8 39:16 40.7 15 41.1 42.7 44:24 45:13,16,18,22 46:16,17,20,23,24 47:1 50:17 52:9 53:13 54:5,21 60:9 69:23 70:4 99:9 107:7.8 125:18 126:6 127:5 151:10.14 162:5 172:5 175:6 197:1 206:12,14,25 207:10 professed (1) 75:9 professional (6) 119:17,25 138:9 197:14,21 198:5 professionals (2) 130:2 174:23

programme (11) 119:19 127:23 130:23 131:25 132:1,10,22,23 136:10 195:13.15 progress (2) 124:22 137:6 project (164) 3:14 6:25 7:9,15 10:25 11:14 13:20 14:1,20,22,24 21:22 25:6,15 26:1 32.10 33.1 34.4 43.14 44:17 45:25 46:1 52:24 58:3.11 59:7 76:3 80:15 87:25 91:16,22 93:5,16 95:19 96:11.18.21.25 97:13 100:7 101:3 102:3.14 103:8.10 104:4.17 112:1.15.24 113:11.20 114:11.12 115:16 118:6,11 119:3.14 122:9.24 123:2,8 124:25 125:4,10,16 127:18 128:10.12.21 129:5.7 130:18,19,21,25 131:4,5,10,21,23,25 132:20.21.25 134:10,18,24 136:3,10,17 137:1,7 140:14 141:3.16 142:13 143:5,6,22,25 144:2.15.20.21.22.24 145:6 146:15 148:25 149:25 150:5,20 152:7.10.15.18.22.25 154:10,14 156:5 158:20 159:9,25 160:24 161:10,19 165:19 166:12,16,19 167:5.23 171:3 172:19 173:18 174:16.22 175:12,20 176:13,21 177:5 178:15 179:16 180:24 182:4 183:2.24 185:20 188:21 189:10 193:23 194:13 195:1 199:20 200:15 201:12,13 203:17 204:14 206:3 projects (70) 3:19 6:6,6,13,18 7:12 19:10.13 20:10.22 24:2 33:11,13 34:12 41:22 45:24 56:23 64-17 65-14 16 91-6 8 92:4,7,12 96:14,15,24 101:19 113:5,6 125:13 127:20.21 128:4 130:3,24 133:17 134:25 135:3,5,9,18,24 136:2.6.9.12.15 141:1,14 143:4,11 150:9.17 151:2.8 157:21 161:14 169:12 171:8 187:9 188:8 190:25 196:1,10 199:8,10,10 202:16 promote (1) 163:8

prompted (1) 79:6 propagate (1) 206:20 propagation (1) 207:12 properly (1) 24:11 properties (2) 107:1,2 proportion (1) 136:16 proposed (10) 16:24 56:9 65:2 66:14 69:22 164:3,12 171:19 172:1 197:1 protected (1) 188:7 proteus (35) 20:2,7,18 21:7 26:17 28:7.17 29:3,5,15 33:23 37:21 38:10 39:8 40:2.4.19.24 48:24 52:9 53:13 55:17 60:11 62:14 72:11.17.19.24 73:3 78:11.17.21 79:11,11,17 provide (26) 3:10 7:14 8:13 9:23 11:2,22 12:21 19:25 27:10 31.13 15 42.22 47:2,11 52:11 61:5 69:7 71:14 89:4 118:19 119:16 122:15 142:14 155:23 163:7 206:19 provided (20) 6:9,12 13:5 19:22 21:21 31:16 38:1 40:2 42:21 43:15 53:17 58:2 60:13 62:1 72:1 97:11 119:23 141:2 185:6 187:19 provider (3) 139:14,20,23 provides (1) 46:7 providing (5) 47:24 48:21 57:12 97:20 207:4 provisions (2) 158:14 198:8 publication (3) 122:4,8 203:9 publications (4) 10:15,15 124:11 178:17 published (1) 36:7 pull (5) 109:21 110:9 141:4 161:23 205:22 pulled (2) 12:24 56:18 purchase (1) 89:5 purpose (12) 31:18.21 32:12,17,18,19,20,24 42:9 88:17 154:20 163.5 purposes (1) 85:16 pushing (1) 56:8 puts (1) 76:22 putting (2) 21:24 114:14

q (864)

promoted (5)

125:8

112:15,16,20 115:13

2:5,12,15,17,19,23

3:4.7.10.18.22 4:1

5:8.10.12.14.18.22

7:1,7,9,14,18,20,25

6:3,9,12,17,21

8:6,12,17,23

9:3,5,12,16,22 10:1.5.7.9.14.18.23 11:5,16,19,22,25 12:3.7.14.16.20 13:1.7.11.15 14:4,15,19,24 15:2,11,21,24 16:4,9,14,16,21 17:1,6,13,24 18:21,25 19:6,14,19 20:4,12,16 21:2.10.15 22:1.4.7.16 23:1,4,20,22 24:4.12.19.24 25:2,17,21,25 26:5,13,18,20,24 27:8.18.22.25 28:6,11,14,17,25 29:10.15.17.22 30:22.25 31:3.6.8.23 32:1,5,7,12,16,20,25 33:4,6,22,25 34:2.9.16.21.25 35:2,5,7,14,18,23 36:1,6,9,11,25 37:2.4.10.24 38:10 39:1,5,13,18,22,25 40:7.11.14.18 41:2,11,14,17,19,21,24 42:13 43:6,13,19,22,25 44:4.8.13.18 45:2.12.18.21.25 46:2.6.11.14.17.21.24 47:4.7.13.15.20 48:2,4,11,13,16,19 49:1.19.21.25 50:3,6,11,19,25 51:7,10,22,24 52:5,17 53:7,16,20,24 54:7,9,12,16,20,24 55:8.18.20.22 56:5,7,11,24 57:2,5,16 59:4,11,14,17,22,25 60:3,13,16,22 61:3,5,8,11,15,20,24 62:3 63:19 64:21 65:7,13,16,20 66:1,6,11 67:4.6.10.12.14.17 68:11,13,18,22 69:3,10,16,21 70:3.9.14.17.20.22 71:7,11,13,19 72:2,13,17,21 73.5 10 16 22 24 74:1,18 75:9,12,19 76:14,24 77:5,24 78:2.10.16 79:1,3,10,16,23 80:4.17 81:2.5.10.13 82:2,4,8,14,18,22,25 83:8.13.17 84:25 85:10,13,17,23 86:2,5,16,24 87:4,17,19,24 88:4,8,10,13 89:3,7,11,22 90:1,11,15,20,24 91.3 9 19 92:3,6,10,14,20,24 93:3,7,11,14,17,24 94:1,12,14,16

95:2,10,18,20,23 96:4.7.25 97:2.7.11.17 98:24 99:2,6,11,22 100:1.13.16.21.24 101:1.7.13.16.21 102:2,11,15,17,19 103:7,11,16,18,21 104:1,6,8,15,21 106:20,24 107:3,6 109:16,18,20 110:1.3.7.16.20 111:6,11,13,15,18,21,24 112:2.9.12.14.20.22 113:2,5,11,14,19,25 114:4,9,12,16,18,22 115:1.12.16.19.21 116:6,9,11,14,17,19,23 117:2.6.9.11.14 118:3.9.15.22 119:1,3,8,12,16,22,25 120:2,13 121:5.10.15.19.22 122:1,8,11,15,19,22,24 123:2,7,10,12,15,19,23 124:1.8.11.13.16.19.24 125:8,12,15,25 126:5.8.13.15.20.23 127:3,7,11,14 128:1,13,19,23 129:5,13,20,24 130:2.8.13 131:3,7,13,17,20 132:6.9.11.16.18.23.25 133:6.10.15.21 134:1,5,8,17,20 135:8.14.17.20.22 136:11,16,20,22 137:5,9,20 138:3,9,14,16,20,25 139:5,18 140:1.7.11.20.24 141:11,20,23 142:3,6,8,12,20,22,24 143:3,11,13,19,21,24 144:4,10,15,19,23 145:4,8,11,13,18,20 146:2.6.10.13.18.21 147:7,9,15,19,21 148:4,8,13,22 149:1.5.9.13.20.23 150:2,4,6,11,13,16,19 151:6.21 152:2.4.10.16.20 153:3,5,8,15,21,25 154:3,6,13,18,20 155.3 8 17 156:4,7,13,23 157:5,9,17 158:2,8,12,17,22,25 159:5,12,15,24 160:2.7.12.18.24 161:5,10,18,21 162:9.14.17.19.21.23 163:4,13,19 164:8.16.19.24 165:6,10,18,24 166:1,3,11,17,21 167:4,9,14,23 168:4,10,13,16,19,23 169.7 170.21 171:3,9,13,18,23 172:3,8,13,18,21 173:1,7,10,15,18,20

174:5,14,18,22
175:1,11,14,22
176:11,16,20,23 177:2,8,21,24
178:6,9,15,23
179:2,5,9,15,24 180:18 181:3,6,20
182:8,11,25
183:8,13,23 184:4,6,13,16,18,20
185:1,11,19
186:2,6,20,25 187:4,13,15
188:1,6,10,20,25
189:9,14,22 190:3,19
191:3,13,17 192:20,23 193:8,11,14,21
194:12,15,21,24
195:8,16,22 196:6,12,19,25
197:6,11,17,25
198:4,8,13,19 199:3,6,10,16,19,25
200:4,9,13,18,23
201:1,3,10,15,22 202:3,10,17
203:1,8,12,20
204:16,22 205:9,20
206:5,23 207:8 qualification (1) 40:7
qualifications (3)
110:22 112:23 115:2 qualified (2) 127:6,8
quality (5)
200:14,16,16,18,22 quantity (2) 3:2,4
quarter (1) 169:22
<b>quartz (3)</b> 38:8 52:10,12
queries (2) 25:17 51:18
question (25) 1:22 12:8
15:2 44:21 47:20 63:25 64:7 69:9 89:23
97:21,21 98:10,19
99:4,13 106:9 109:1 119:22 121:10 140:2
173:15 181:22 191:20
197:16,17 questions (20) 1:16,21
2:24 5:3 35:18 46:3
98:9 105:3,10,14
106:3 107:13 108:19 120:17,22 137:9 151:1
207:20 209:4,6
quickly (4) 94:19 112:15 120:8 165:23
quiet (1) 85:5
quite (11) 13:13,14,25 15:2 19:24 20:19
80:12 83:5 134:15
175:7 204:1 quotation (45) 3:16
6:14 8:14 11:8
27:11,15 28:2,17
29:5,24 30:2 31:3 46:3,8,12 50:12,21
52:20 53:1
57:5,8,9,18,20,21,25 58:1,10,17 60:7 62:6
67:2 71:25 73:9,12
80:2 89:4,12 90:5,12 100:22 101:12 103:25
106:11,12

quotations (12) 12:21 23:23 26:6.7.21 52:11 55:18 56:2,9,25 71:8 90:25 quote (14) 27:20 30:18 43:11 46:9 48:21 49:3 51:25 52:14,17 53:17 54:3 55:3 56:1 73:6 quoted (10) 9:9 21:23 30:5,14,14 45:8 48:10 52:15 62:7 73:24 quotes (5) 18:22 20:7 25:5 52:8 55:5 quoting (5) 52:3 54:13 73:19 77:17 103:23 R railing (1) 205:1

rails (1) 30:20 rainscreen (45) 16:19 24:16,17 26:22 27:11 30:6.7.10.11 37:19.25 39:8 41:3 45:6,23 46:16.17 48:4.5.22 49:11 51:16 52:1.9 200:18 53:2,4,19 59:11 60:6,14 61:22 78:21 79:17 89:19 91:14 203:4 145:5 186:8,11,16,21,22 187:1.7.18 190:11 rainscreens (1) 179:12 rainwater (1) 84:6 raise (4) 25:17 52:3 71:7 173:15 raised (4) 69:3.10 130:11 197:7 range (5) 22:21 43:3 76:6 77:16 127:10 ranges (1) 74:10 rapid (3) 165:12 186:12 206:16 194:21 rate (7) 19:22 21:17,19 23:10 68:5 76:6 91:17 rated (9) 17:17,22 32:23 35:3,4 45:13.16.18.22 rates (7) 22:18 29:21 59:17,19 73:12 76:2 77:12 rather (12) 20:7 24:9 28:2 45:9,9,10 77:16 146:10 90:3 91:9.24 150:24 171:12 rating (3) 151:13 166:6 146:20 192:18 ray (41) 6:15 7:23 9:4 15:14 16:13 18:2 19:12.16 21:13 25:23 31:14,24 32:1,6,8 33:2 35:16 41:8,20 47:14 57:9 58:14 61:21 70:1 75:21 83:18 84:25 87:7 90:23 92:9 98:22 99:5 118:3 125:15 133:9,25 134:1 137:16 147:25 139:5 144:14 173:9 recommends (1) 163:25 re (1) 96:11 record (1) 75:23 reach (2) 58:7,10 records (1) 138:10 reached (2) 104:18 recount (1) 144:25 105:10

50:19 109:16 110:1 122:8.22 148:25 154:18 161:18 164:18.20.25 176:11 177:15 193:8.10.11 195:3,15 readied (1) 23:2 readiness (1) 22:2 reading (9) 49:24 80:21 86:21,22 146:18 147:7 148:22 164:23 175:18 reads (1) 186:10 ready (6) 5:1 15:9 28:12,14 63:8 170:12 realise (1) 189:20 really (36) 3:25 6:14 8:20,21 10:17,20,20 17:3 19:12 20:9 22:2 27:16 29:20 32:14 39:12 40:6.10 47:17,25 48:9 50:15.24 52:3.14 57:1 64:18 65:24 71:18 73:13 76:23,25 78:5 85:22 91:12 99:10 reason (7) 8:1 22:1 75:9 91:3 93:24 142:5 reasons (5) 9:5 44:8 87:12.13 168:9 recall (39) 6:25 7:11 18:20 23:21 28:16 29:7 34:15 49:18 54:23 55:19,21 56:4 61:19.20 62:2 68:25 69:2 75:15,17 92:8,13 97:1 101:19 112:17 123:15 130:9 140:21 141:8 146:10 147:7 148:1 149:1.5.9 152:7 162:14 165:8 172:21 receive (3) 11:19 114:22 148:25 received (20) 3:4,12 11:10 13:21 14:3.13 15:1 19:20 24:10,13 25:7 36:2.23.25 43:23 50:6 121:5 122:11 140:13 166:18 receiving (3) 16:2 24:6 recently (6) 2:15 102:6,10 109:16 110:1 recognise (1) 206:4 recollect (1) 203:15 recollection (12) 16:1 41:21 51:25 55:14 56:7 64:12 76:14 135:4 173:10 175:18 179:2 202:1 recommendations (2) 188:14 202:21 recommended (1)

recovered (1) 140:14

reduced (1) 81:11

reduction (4) 68:20 69:1 72:3.7 reductions (3) 70:4 71:15 73:5 ref (1) 52:24 refer (3) 10:14 69:23 99:3 reference (10) 18:10 20:17 28:22 50:20 71:1 84:2 88:23 89:17.23 204:7 references (1) 130:2 referred (13) 17:2.9 20:1 54:5 64:23 89:21 98:20 101:25 104:24 143:5 147:21 168:19,20 referring (15) 17:19,21 33:18.22 40:15 65:4 67:8 85:8 87:14 95:16 99:4 106:16 139:21 167:10 184:8 refinery (1) 113:21 reflective (1) 84:9 refurb (1) 95:5 refurbishment (7) 11:7 14:20 125:4 137:7 141:17 142:10 181:9 regard (2) 45:17 155:11 regarding (8) 25:17 74:24 75:13.23 76:18 77:10 96:13 192:15 regardless (1) 46:17 regards (2) 49:10 107:8 regimes (1) 122:13 regularly (1) 10:18 regulations (31) 9:18 10:3 35:21 117:3,5 118:1 119:6,10 122:17 133:11,22 152:24 153:6.10.22 154:25 155:6 163:15 171:5 180:4 181:25,25 187:16 191:22 195:20,25 196:9,17,23 197:4,9 regulatory (3) 35:18 152:21 197:8 rejected (2) 161:16 175:10 rek (3) 14:6,16 19:15 related (5) 62:24 139:13 177:18 198:10 207:23 relates (3) 21:15 141:5 177:16 relating (2) 97:8 153:22 relation (13) 24:16 41:11 72:7 81:2 95:13 96:24.25 97:12 99:16 140:13 144:11 198:15.22 relationship (2) 194:4 relative (1) 88:5 relevant (17) 49:14 99:14 121:16,18 123:3 124:3 130:21 143:5 147:19 173:12 181:14,24 191:24 194-10 195-14 18 197:8 reliably (1) 25:15

reliant (2) 92:1 98:17

relied (2) 101:6 202:15 relies (1) 84:4 rely (1) 47:9 relying (1) 102:10 remain (1) 140:4 remains (1) 163:15 remeasured (1) 29:20 remember (92) 5:8 12:9,11 15:19,21 22:24 34:4 36:21,25 44.3 48.8 51.22 24 52:2 54:17 61:23,24 64:14 70:14.17 71:20 85:13,14 86:22 87:19 91:20,21 92:10 94:12 95:13.15 96:4.22 97:3,8,10,11 99:18,22 100:11.13.15 101:21 102:5 103:23 113:3 115:15.20.21 116:22 117:20 123:9.10.16.17.23 131:11 133:19 134:6,19 143:18 144:2.16 145:18 147:13 148:22 154:19 159:3 161:2.12 162:11,25 164:23 165:7 168:18 173:12 178:3,5,6,8,11,21 179:7.17 184:22 189:17,22,24 190:1 202:2 204:12 207:22 remembered (1) 146:14 remit (3) 150:15 193:24.25 remote (1) 4:20 remove (4) 139:14,20,23 140:3 renteurs (1) 4:11 repeat (2) 69:9 109:1 rephrase (1) 1:22 replace (1) 145:2 replaced (1) 140:17 replacement (1) 144:6 reply (1) 14:16 report (13) 145:20.24 146:7,10,18 147:21,23,25 148:1,5 156:17 171:9.23 representative (3) 152:17 164:19 178:6 representatives (3) 152:6 178:24 179:3 reps (1) 194:1 request (6) 27:3 43:15 79:8 101:24 121:6,9 requested (5) 49:3 52:8 86:13 102:1 191:9 requesting (1) 121:3 required (19) 8:3 37:20 42:6,22 89:3 101:3 113:11 129:1 138:17 159:5 160:13 169:3 187:6,8,14 188:16 196:13 201:4 202:5 requirement (9) 58:25 123:1 154:3 155:5 173:25 174:19 175:2 181-11 183-16 requirements (23) 7:20 35:19 117:2 127:10 132:5 152:21,23

153:11,14,17,19 167:19.25 169:2 176:4,14 182:19 195:19 196:16.16 197:2.8 201:5 requires (1) 187:18 requiring (1) 55:13 research (1) 122:3 residential (3) 7:7,8 161:7 resist (3) 155:10 190:13,22 resistance (2) 166:25 176:1 resisting (1) 154:4 resource (5) 127:21 128:11 129:3,10 135:3 respect (12) 16:18 41:3 52:1.11 68:9 75:25 81:10 106:25 114:23 172:8,13,19 respects (1) 191:24 respond (2) 74:22 77:15 responding (1) 24:18 responds (2) 22:11 52:18 response (4) 18:6 19:20 23:5 97:20 responsibilities (4) 195:10,12 198:15,22 responsibility (12) 98:12 124:14 128:8 144:10 163:14 172:24 173:1 195:16,23 196:2 200:1 202:11 responsible (4) 133:23 144:1 160:16 196:7 rest (1) 99:16 restrict (1) 185:8 restricted (2) 50:22 166:5 restricting (1) 55:1 result (2) 21:5 81:21 results (3) 120:15,25 174.9 resume (1) 207:21 retain (2) 137:21 138:10 retained (3) 138:15,22 199:21 retardant (2) 34:19 44:25 return (3) 56:17 84:14 185:1 review (2) 96:11,18 reviewed (2) 13:22 25:8 revised (4) 70:14 71:20,22 73:18 revision (1) 103:2 revisions (2) 103:1 132:3 revisit (1) 63:15 reworked (1) 72:25 reynobond (77) 16:19,23 18:14 19:1 21:15,21 22:19 24:21,25 33:19 38:7 39:9 40:1,5,20,23 42:4,22 43:7,11 44:24 46.18 20 49.12 23 50:8,23 52:9,12,15 53:7,17 54:1,4,13 55:2,12 56:1,8

60:12,13,20,23 61:25 62:6.8.11 67:25 69:23 70:4,6,11,15 71:15,17 72:8.11.20 73:1.2 74:24 75:2.7 76:11,15,18,19,24 77:3,12 79:19 81:7 87:9,25 99:18 145:11 150:8 righthand (9) 29:1 94:8 102:25 159:1 177:17 178:1 186:9 190:6 206:8 rigid (4) 88:21 103:23 167:17 176:7 ring (3) 23:20 43:20 101:14 rises (1) 165:11 risk (5) 66:23 155:24 156:1.9 203:2 risks (5) 165:8,18 192:15.24 203:21 rivet (1) 87:8 riveted (1) 88:2 rivets (1) 84:14 robotics (1) 111:3 robust (1) 166:4 rockwool (3) 145:8 150:16,20 role (51) 3:11 5:4 9:24 10:24.24 26:4 31:23.25 35:12.15 42:5.5.11 44:10.11 90.18 111.24 112:12,23 113:11.19.21 114:9.23 115:13 119:18,19 122:25 124:25 125:9 126:1,2,8,19 127:1,17 128:2,23 129:22 131:20 132:19 133:13 144:20.22 149:3 150:14 151:22 178:20 186:25 194:1 196:25 roles (1) 131:3 room (6) 4:21 62:23 105:18 148:17 169:24 207:24 roome (12) 94:17,20 96:1.4.9.23 97:11 120:10 161:22 162:12 170:19 191:4 rough (1) 30:16 roughly (6) 100:13 108:14 112:16 113:2 132-14 134-13 round (1) 66:18 rounds (1) 162:6 route (9) 70:7 75:5 76:19,21,25 172:4 173:15 206:19 207:4 routes (1) 170:23 rs5000 (13) 34:2.9 92:24 93:9 96:20,23 97:5,9 104:9,11,12,23 120:15 run (1) 156:11 running (5) 4:4,5,19 14:10 128:12 runoff (1) 84:6 ryd00002606 (1) 57:22 ryd00002607 (3) 29:23

read (25) 2:15 38:14

43:22 44:9,11,14,19

58:18 89:13

ryd000026072 (1) 58:20 ryd000026079 (2) 30:3 89:15 ryd00003315 (1) 66:12 ryd00003316 (2) 69:18 ryd00004085 (1) 78:12 ryd00004916 (1) 74:2 ryd00005425 (1) 87:5 ryd00009596 (1) 80:4 ryd000095962 (1) 80:18 ryd00009823 (1) 81:13 rvd000260710 (1) 60:3 ryd00026078 (1) 90:1 ryd00046822 (1) 102:22 rvdenssic (1) 95:12 rydon (41) 12:17 29:24 30:15 31:12 57:10,19 58:21 65:7.23 73:19 74:14 80:5 81:6 82:16 85:20 86:19 100:2,17 101:1.21 141:2.9 142:25 144:15 152:6 162:21 173:18 195:4 196-13 14 197-12 19 198:9,16,23 199:4,25 200:4.13.23 201:4 rydons (7) 37:3 66:3,5 67:16 79:8 198:25 199:7

-

s (1) 84:4 s3 (1) 159:12 safe (1) 150:7 safest (1) 189:15 safety (13) 32:16 33:4 35:24 36:2 42:10 87:22 97:24.25 107:3 122:20 153:23 154:8 155:24 sakura (1) 38:7 sales (4) 78:22 94:4 97-9 164-22 salesforce (3) 93:20 95:24 177:14 same (40) 12:2,4,6 22:8,10 37:7 40:23 41:11 56:5 57:24 58:1.4.21 60:24 61:1 68:5 74:10,12 76:6 77:9 81:2 83:21 86:7 96:8 98:1 99:4 114:13 121:3,10 134:23 154:23 155:2 157:24 160:4 165:7 168:9,23 175:16.25 182:21 samples (1) 18:7 sarah (1) 205:24 sat (1) 154:18 satisfied (3) 172:22 173:2 189:11 satisfy (3) 153:14 188:14 189:5 satisfying (1) 154:24 saving (12) 68:2 72:14,16 73:2 76:4 78:2 80:19 81:6.16 82:10.18.22

saw (18) 16:1 27:2 36:21 38:10 54:2 58:18 71:1,1 75:12.16.17 79:16 85:7 97:8 165:6 203:16 206:2,4 saying (15) 1:25 46:22 109:7 120:13 121:5 147:13 151:6,22 174:14 182:25 183-11 23 184-19 22 192:21 scale (1) 156:19 schedule (4) 35:21 49:10 153:21 155:5 schedules (1) 51:13 scheme (1) 73:13 schemes (2) 141:17 142:10 schueco (1) 113:1 scope (4) 11:9 29:11 89:1 132:1 scoping (1) 132:6 screen (7) 2:8 15:18 32:23.24 63:15 94:25 109:10 scroll (4) 50:2,25 83:19 95:2 scrolling (2) 83:25 84:21 sea00000153 (1) 37:14 sea000001532 (1) 37:16 sea0000015363 (2) 37:24 42:16 sea0000015364 (1) 37:18 sea0000016973 (1) 88:18 sea00002275 (2) 15:16 sea000022752 (2) 17:13 45:12 sea00009997 (1) 21:10 seal (1) 185:6 sealants (1) 159:19 searches (1) 165:15 second (17) 27:8 36:17 38:14 58:22 81:17 82:19 83:19 86:11 87:9 94:9 109:20 120:13 137:10 148:15 188:12 202:23 203:13 secret (1) 67:22 section (7) 60:6 146:4 155:18 163:21 168:23 169.3 202.4 security (1) 140:9 see (288) 4:12 5:18 6:3,17,21 9:22 10:14,23 11:25 12:3.20 13:11.15 14:7,8,10,12,15 15:11

16:4 17:6.14.18.24

19:2,16,17 20:4,16

22:7,14,19 23:5,14

24:12 25:25 26:5.6

29:1.8.11.25 30:4.4.25

31:19 32:7 33:8 34:2

37:2,4,10,15,17,19,22

seems (1) 84:7

seen (23) 13:12

21.24 25 24.6 27.1

52:7 53:16,21 59:5

61:16 62:4 76:9 93:23

102:6,10 103:9 140:22

21:10,13,16

27:14,18,19

36:13,15,25

28:1,6,11,19,22

38:1,6,8,13 39:1,13 40:11.18 41:24 42:20 43:10,13 45:7 47:13 49:4 51:3,6,7 52:19 53:5.24 57:14.19 58:5,22 59:2,6,22,25 60:3,5,6,13 61:3,8,15 64:21 66:6,11,15 70:20,23 73:16 78:13 79:1,10,15 80:6 81:18 82:14.18.25 83:20,23,25 84:12.21.23 85:5 86:2,14 88:19 89:7,16,22 90:4,5,7,15 94:6.8.20.23 95:3.11 96:15,19 97:20 98:24 99:2 100:9 101:7 102:17.19 103:2,7,15,18 104:8,21 105:14 106:2 107:6.7 111:4 114:18 117:11 120:14 121:5 125:6 126:20 127:24 128:17 131:1 133:10,12 134:7,8 135:6.17.22 136:11 137:18 138:1,7,14,23 139:16 140:1 141:5,18 142:10,18 143:4,9,21 144:5 145:21.25 146:2,3,6,7 147:5 148:4.5.6.10.20 151:6 152:4 155:5.6 156:2,13,21 157:14 158:10.15 159:22 161:8,21 162:7 163:11,17 164:6 165:4,16 166:9 167:2,21 169:5 170:22.25 171:13,16,21 172:1 174:3,7,20 175:11,22,24 176:6,9 177:11,18,19,21,22 178:23 179:13 180:7.16 181:18.22 182:23 185:9,17 186:18 187:3,20,24 188:10.12.18 189:7 190:3 193:21 194:18,24 200:23 201:25 202:5,7,8,18,24 203:6,13 204:9,19 205.7 9 206.21 23 208:2 seeing (11) 12:11 22:24 29:7 49:17 101:10,17 141:8 148:1 202:1,2 204:12 seek (4) 26:21 129:25 152:2 168:13 seeking (7) 4:10 26:7 27:15 46:3 50:12 56:8 71:8 seem (1) 162:5

141:10 146:20 158:19 179:15 183:6 201:24 selected (5) 66:25 75:14 81:23 141:15 142:9 selection (1) 9:13 selfish (1) 20:21 send (8) 51:16 79:6 84:12 91:10 99:24 120:7 121:4 163:2 sending (4) 27:3 36:22 37.5 194.21 sends (3) 21:12 84:21.25 senior (4) 124:6,20 173:5,5 sense (1) 132:22 sensible (2) 91:9,23 sent (36) 26:20 37:9 43:17.19 44:2.13.23 52:6 53:11 57:9 99:13,19,20,22,24 100:18 113:23 134:2.7 140:13 146:13,16 151:1 154:15 158:21 161:14.21 162:12 164:19 166:15 169:15 170:19 191:4 193:17 195:4 200:20 sentence (7) 111:1 125:3 128:14 135:8,25 148:15 175:25 sentences (1) 137:13 separate (1) 191:15 september (2) 1:1 208:11 series (1) 14:9 server (7) 137:24 138:12,13,23 140:5,12,18 service (5) 6:1 110:9 139:14.20.23 serviceability (1) 79:4 services (3) 111:8,22 113:16 set (13) 50:8 60:7,9 69:22 80:11 82:15,20 89:7 96:15 139:4 142:15 151:18 170:23 sets (1) 37:20 several (1) 136:6 severity (1) 148:16 sfe (2) 192:6,8 shadow (1) 84:5 shake (3) 2:1,3 117:16 shall (4) 108:14 155:9 203.23 share (1) 75:12 shed (2) 104:2,23 sheet (1) 86:17 shoes (1) 198:25 short (8) 4:15 63:6 105:13,25 108:4 110:3.10 170:10 shortfall (2) 81:18,22 shortly (5) 15:12 34:9 93:5 106:5 145:22 should (30) 1:25 24:15 44:9 47:15 55:3 65:18,22,22 68:14

72.5 86.10 93.24

105:8 124:8 155:22

156:15,24 158:13

159:20 167:19,25

skill (1) 142:14

slight (1) 90:6

skipped (1) 105:4

slightly (3) 16:10

176:16 181:16 192:7.17.19.20 193:6 198:14 202:20 shouldnt (1) 83:15 show (6) 15:15 22:8 66:20 98:9 106:7 182:22 showed (2) 59:5 169:13 showing (5) 44:21 84:16 162:10 171:10 187:10 shown (6) 19:1 23:9 66:22 76:4 103:18 196:15 side (8) 13:9 51:1,1 103:13,18 177:17 194:8 206:8 sides (1) 88:24 sig (1) 26:11 sig00000042 (1) 28:18 sig000000421 (1) 29:10 sig000000422 (1) 28:25 sig00000139 (2) 26:9 36:13 signature (4) 2:13 94:21 109:14.23 signed (5) 58:21 157:23 158:1 190:2 193:4 significant (1) 68:2 significantly (1) 88:1 silver (1) 68:3 similar (24) 5:23 28:9 38:19.23 39:14.17.18.19 40:2,8,22 60:24 71:17 90:13 106:14.17.19.24.24 135:25 141:14 147:7 148:22 159:19 similarly (1) 36:9 simon (14) 57:24 66:16 74:3.20.21 78:13.16.19 79:9 83:22 84:22 85:4 86:8 87:6 simple (2) 73:22 140:17 since (5) 3:7 101:19 140:22 175:5 182:7 single (1) 35:7 sir (41) 1:5,13 4:3.8.12.17.25 62:18,22 63:1,8,10 105:6,9,17,20 106:2 107:16.20.23 108:2,6,8,10,12 117:15,19,21,22 169.20 170:2,3,6,12,13,14 204:4 207:16,25 208:1.6 sit (3) 1:14 108:13 194:4 site (4) 87:11 128:10 137:3 152:10 sits (1) 1:24 sitting (1) 198:24 six (2) 67:4 114:5 sixseven (1) 101:20 size (2) 5:23 112:18 sketch (2) 84:16 159:1

29:16,17 small (1) 6:24 smoke (7) 80:23 83:3 185:8.16 186:11.17.20 society (1) 192:6 solely (3) 137:3 166:25 168:25 solutions (1) 37:22 solved (1) 4:24 somebody (1) 195:22 someone (6) 69:14 83:4 98:15 99:3 129:8,11 something (36) 5:20 23:17 28:7 31:17 63:15 78:3 92:18,19 101:19 121:2 122:7.19 123:16 124:5,6,16,19,21 133:16 135:24 151:3 156:10 157:14.18 158:4 159:5 163:2 167:6 175:11 177:16 179:22 190:1,15 191:8,14 201:12 sometimes (2) 43:4 128:15 soon (2) 4:4 56:25 sort (23) 8:10 9:10 10:22 17:22 28:9 30:19 39:3 48:7 50:2 56:22 64:20 65:14 73:11 75:15 76:20 113:7.9.22 126:19 178:12.19 179:21 193:17 sorts (1) 65:16 sought (2) 50:22 56:2 sounes (5) 18:1 21:12 83:20,25 86:9 source (3) 18:22 181:9 205:4 southend (2) 95:4 96:17 space (2) 143:7 185:15 spalling (2) 166:8,13 spandrel (3) 29:12 30:6,10 speak (1) 99:9 speaking (1) 179:2 spec (5) 23:4 62:1 102:22 142:16.23 special (4) 17:5 76:7 158:3.4 specialist (6) 10:15 124:2 142:14 160:19 196:19 200:6 specific (17) 25:17 41:21 50:22 61:6 65:17 76:2 90:25 91:1.23 92:21 97:22 121:2,9 128:23 160:8 172:9 188:1 specifically (8) 18:18 21:2 51:25 92:10.10 104:24 129:4 169:8 specification (61) 7:16 11:11,23 13:17,24

14:13 21:9 24:13.22

31:11 32:8

36:12 18 21

25:10,14 26:8 27:4,13

37:4,11,20 38:16 39:7

40:11,14,16 42:15,16

50:9 51:15 52:6,8

53:12 54:5 60:10 61:17 88:14 89:8 93:8 99:14,19,23 102:13,22 104:13.15.24 150:23 151:24 197:3 201:4,8,9,10,12,16,17,21,24 202:18 specifications (4) 51:13 104:3 151:9,11 specified (18) 8:21 9:7.8.9 24:15 27:7 38:2,11 41:12 61:1 88:20 89:17 90:16 93:4,8 151:10 172:10,15 specifying (1) 21:7 spectra (1) 38:7 speed (2) 79:4 165:11 spend (2) 80:21 113:2 spending (1) 136:17 split (1) 136:8 spoke (2) 77:12 96:13 spoken (2) 85:4 183:5 spread (30) 147:14,14 149:3 154:4 155:10.23 165:1,13,21,22 166:2.6.24 167:1.9 168:25 175:25 185:16 186:11,17,20,22 187:2 188:7 190:13,22 191:25 206:15.16 207:4 spreading (3) 147:2,12 148:18 spreadsheet (2) 19:6 76:10 spring (1) 4:7 square (13) 6:23 21:18,20 60:17,18 73:12 91:17 100:21 101:13 102:1 134:25 136:25 137:8 staff (1) 137:2 stage (30) 9:23 11:17 12:5 16:24 19:9 23:24 24:8,8 26:4 34:5,6 45:7.9 52:13 55:16 60:25 62:13 76:25 79:12 86:18 102:3 104:4.12.18 108:15 114:16 121:25 127:11 139:12 203:2 standard (22) 21:17,19 22:21 38:24 39:20 40:3 42:23,25 43:2,3 44.24 67.25 68.3 4 76:6 77:12,16 181:14 197:13,20 198:1,4 standards (2) 97:25 191:22 stands (1) 140:23 stapley (12) 133:8,25 134:1 144:13 148:10 173:9 177:7 193:20,25 194:15,16,21 start (7) 2:24 67:12 76:20 107:25 110:21 118:7 126:19 started (8) 64:15 114.24 115.3 116.2 118:24 134:13 174:14 179:22

savings (9) 66:24 69:22

82:15.20 85:24

73:11 74:11,15 81:11

stated (2) 76:3,7

206:15,16

181:12

79:16

surfaces (3) 158:9,13

surprised (2) 67:24

surrey (1) 116:1

surrounding (1) 147:3

survey (2) 147:22,23

sustained (2) 205:6,14

system (42) 9:8 29:3

38:4 49:11,22,25

50:19 62:15 79:21

86:12 99:9 104:16

112:5 114:15 139:4

surveying (1) 3:4

surveyor (1) 3:2

sussex (1) 111:2

statement (41)
2:5,10,15,20 11:6
13:18 25:2 31:9 33:7 34:3 41:25 57:7 63:13
64:22 70:23 97:19
109:13,16,20,24
110:4,8,10,13,24
112:14 113:14 114:4 115:23 125:1 127:15
130:15 134:9 137:11
139:6 173:20 181:7,21
182:9,12 191:19 statements (2) 109:8
110:17
states (2) 68:3 159:16
stating (3) 66:23 129:18 171:24
statutory (3) 10:5
195:18 196:16
stay (2) 38:12 74:11
stayed (1) 140:12 steel (1) 205:18
steps (4) 41:4
129:20,24 172:21
steve (1) 66:13
stick (3) 75:2,6 77:11 sticking (1) 67:19
still (9) 79:12,17,20,21
147:1,11 181:10
192:7,9 stipulated (3) 39:20
45:8 102:12
stock (1) 105:11
stood (1) 160:23
<b>stop (4)</b> 166:2 187:2,6 207:15
stopped (2) 124:15
186:23 stops (3) 56:18 80:23
83:3
storey (3) 156:18 159:17 202:22
storeys (1) 144:6
straight (4) 28:5 74:25
77:18,22
strange (3) 54:6,7,9 strength (1) 205:3
stretched (1) 136:22
strike (7) 50:11,20
54:2,6,7,9 102:2 string (1) 14:8
strong (1) 193:2
struck (1) 50:18
structural (38)
115:5,6,7,10 116:1 119:7,9,21 122:25
124:12 131:12,17
133:3 135:10 136:14
150:14 153:2,3,12
155:1 160:16 168:3 172:12,24 173:17
178:21,24 179:19
183:4,20 184:2 188:22
191:9 193:16 194:2,8 201:17 205:16
struggling (1) 126:24
studies (5) 161:13,14
163:1 171:7 175:7
studio (18) 12:5 14:6 15:13 18:2 19:15
22:16 31:12
65:6,9,10,23 66:2,5,8
86:9 162:19 173:18

196:21 study (5) 171:9,23 172:14,18 174:2 studying (1) 116:8 stuff (1) 179:19 styrofoam (1) 103:21 subbed (1) 115:7 subcontract (11) 11:2 128:16,20 129:6,14,21 196:12 198:10,13,21 201.3 subcontractor (3) 59:8 128:25 196:19 subcontractors (4) 184:9,16 200:6,9 subject (7) 14:11 65:3 87:8 88:13 93:11 94:10 96:1 submit (4) 38:3 164:2 171:19 190:25 submitted (3) 67:2 141:9 171:7 submitting (1) 164:12 substituted (8) 38:19.23 39:19.22.23 40:1,17,21 successfully (2) 71:4 121:23 sufficient (2) 68:6 127:21 suggested (2) 65:2 124:8 suggesting (1) 156:24 suggestions (1) 68:17 suggests (1) 101:4 suitability (1) 32:9 suitable (8) 6:13 32:3,14 41:5 90:16,21 92:22 98:17 suitably (1) 171:24 sum (1) 58:13 summarise (2) 151:6 summarised (1) 155:13 summary (3) 30:4,8 sunday (1) 145:23 supervise (1) 200:14 supervising (4) 132:19.22 133:10 137:6 supervision (2) 6:12 133:21 supplied (5) 6:1 28:11 37:6,21 76:5 supplier (5) 78:7 98:18 99:12 145:2,3 suppliers (9) 3:14,15,21 47:17,23 59:20 90:25 158:21 178:12 supply (7) 28:14 29:12 38:3 53:2 58:23 74:10 201:18 support (2) 122:6 127:1 supports (2) 80:24 83:1 suppose (1) 33:5 sure (16) 6:12 16:14 19:21 27:6 29:19 32:3 61:24 64:10 75:4

126-12 128-8 9 132-17

156:12 195:12 196:8

surface (7) 69:7 166:24

167:1,9 175:25

147:3.11 155:25 157:7 163:23 164:4.12 168:7,20 171:15,20 172:1,4,10,15,22 173:2.11 176:18 25:7 190:11,20,21 191:14 202:20 203:2 205:3 206:17 systems (9) 88:8 139:15.21.24 140:3 156:19 184:3 201:19 205:2 tab (1) 110:11 table (1) 167:19 tackle (1) 186:24 taken (9) 19:23,24 94:17 129:24 130:2 135:4,9,23 199:25 taking (5) 114:14 118:24 131:18 157:25 172:21 talk (11) 62:23 105:17 123:16 163:1 169:24 174:18 184:7 189:17,22 194:5,6 talked (2) 122:5 177:2 190:21 talking (9) 22:16 126:13 161:2.25 178:23 184:9,12 189:25 204:23 talks (4) 176:3 178:11,13 185:11 tall (2) 156:1,9 taplow (3) 145:14 146:11 149:16 taught (1) 203:23 teaching (2) 116:11,19 team (11) 96:13 98:5,7,21,21 106:23 127:19 132:3 151:16 196:3 200:21 technical (39) 4:15 25:24 27:19,23 31:25 36:7 41:1,9 42:5 44:11 69:14 98:15 99:3 106:22.23 125:17,18,20,21 126:2.6.10.10.16.21.25 thats (144) 127:3,5 161:3,6 163:4.6 173:4.23 174:6 178:17.20 179:11 185:1 technology (3) 9:10 20:1,3 22:3,6 23:3 118:19 192:5

telephone (6) 49:8,15 24:18 25:16,20 51:12 100:4.10.11 26:12.17 27:17.21 telling (4) 28:11 51:25 28:13 29:18,18 161:12 182:2 31:2.5.7 32:11 33:3.21 tells (2) 19:21 163:5 35:6.25 36:8 38:10.24 temperature (1) 205:17 39:21 41:13 42:11 temperatures (1) 43:19 46:23 47:11,18 205:18 48:12,15 50:5 ten (3) 105:6 165:15 53:18,23,23 54:10,15,17,18,18 183:7 tender (28) 3:12,18 55:6 56:6 57:4 11:9,13,19 59:3,10,13,16 60:15 12:7,9,16,24 13:2,22 61:10 63:18 64:1.5 14:2 15:1,7 16:2 24:14 67:3 70:13,21 72:20 25:8 34:5 36:23 38:1 73:21,23 76:13 77:23.24 78:1.1 42:21 56:16.21 58:7,13 59:1 95:4 80:3,16,25 81:1,4,9,9 82:1.24 85:9.12.23 tenderers (1) 11:22 86:1 89:2.6.8.10.19 tendering (1) 11:20 90:10 92:14.16 96:3 tenders (3) 13:21 20:15 103:17 104:5,25 105:16 109:21 term (1) 141:24 110:3,10,11 111:20 terminal (1) 96:17 112:11 114:8,21 terms (47) 8:12 30:16 116:5.16 118:2 119:11 42:9 47:24 48:3,4 126:4 128:22 131:11 53:19 77:15 100:20.21 135:17 138:11.19 107:1 113:6 116:24 144:6,9 155:16 165:25 120:8 124:25 177:5 180:10 181:20 131:15,20 133:10,21 189:1 198:18 199:7 136:22 145:5 149:3 204:2.5 207:15.18 151:8 153:17 154:4 theme (1) 113:6 156:7 158:22 160:19 themselves (4) 101:2 166:11 171:4 172:3 197:14.21 198:5 182:14 188:6,7 thereby (1) 84:6 189:14.15 191:13 therefore (9) 11:17 194:15 196:22 198:1 35:23 74:11 85:10 201:11 205:10,11,15 86:19 168:6 181:14 206:1.24 207:3 182:19 186:15 test (13) 78:23 120:15 theres (9) 17:22 47:1 121:23 156:20 157:1.6 61:15 76:21 107:2 172:9 190:10,19,24 142:5 151:9.11 186:9 191:5,6,14 thermal (9) 88:19 89:8 tested (5) 20:22 107:1 117:8 122:2 168:7,17 176:18 151:8 156:18 202:22 203:22 testing (18) 116:20 thermosetting (4) 120:18,19,24,25 167:17,24 168:4 176:3 121:10.12.16.18 theyd (2) 144:25 161:13 122:12 157:1 theyll (1) 109:10 theyre (4) 47:23 60:17 168:19,20,21 171:12,21 172:4 190:9 91:16 109:9 tests (4) 121:24 160:9 theyve (3) 101:25 168:25 174:9 175:7,9 text (1) 180:7 thickness (1) 151:11 thank (50) 1:13 17 thing (7) 17:14 114:13 2:4,19,23 4:22,24,25 115:5 153:5 155:2 168:2 207:6 5:2 29:18 52:24 62:19 63:4.9.10 thinking (1) 200:18 105:16,19,21,23 thinks (1) 105:9 107:12.13.15.19.20 third (12) 18:5 75:1 108:1,2,10,12,17,20,21,2 77:9 121:11 136:10 109:16 110:7.16.20 162:2 166:23 174:1 175:24 205:21,23 117:22 169:17,19,20 170:5,6,8,14,16 204:6 206:2 207:17 208:3,4,6 thirdparty (2) 182:18 thanks (1) 208:8 183:15 though (2) 104:22 3:3,6,9,20,25 164:19 5.7 11 13 21 7.19 8.5 thought (22) 27:5 34:23 11:4,15 12:15,19 102:5 113:18 124:5 13:13 14:2,18 17:21 132:13 133:25 138:16

164:20 166:14 169:16 183:8 184:4.16.18 186:23 195:22 201:20 three (9) 6:20 30:7 38:7 53:13 139:8 170:23 172:23 202:7 204:22 threequarters (2) 23:24 118:4 through (31) 3:13 7:22 23:25 58:6,9 65:15 67:15 78:7 80:9 92:9 103:1,1 104:19 108:14 118:4.9.14 121:3 122:7 129:13 136:15 149:19,19 151:18 154:1 174:1 183:24 193:21 194:10 199:21 200:20 tied (2) 20:9,13 tight (1) 56:20 tim (2) 146:3 152:14 time (162) 3:7 14:21 15:19,25 16:2 17:5 18:4,17,19 19:10,11 20:25 22:24 23:14 15 24:3 26:1 35:15 36:3 37:13 39:11 40:23 42:18 44:20 47:23 50:6 55:6,7 58:3 61:12 64:14,18 67:4 69:3 70.12 80.21 81.13 83:7 87:24,24 93:3,13 99:19 101:17 102:5 106:20.21 107:6 111:19 113:2 114:24 115:7.19 116:8 118:5,10 119:3,13 121:12,15 122:8,13,22 123:2,7 124:1 125:16 132:7 134:23 135:4.8.23 136:5,7,12,15,16,17,20,22 137:5 138:21 140:23 145:18 148:2 150:21 152-21 154:5,10,13,22,25 156:4.23 158:19 159:8,25 160:20,24 161:10,18 164:14,22 165:19.20 166:12 167:4,23 169:8 171:3 173:4,7,12,23 174:15.22 175:12.19 176:12,21,24 177:4 178:15 179:5,15 180.23 181.9 182:3,9,14 183:1,2,3,9,13,18,19 184:8.16.18 185:19.23 186:2,20 188:1,21 189:9.17.22 190:16 194:12 196:1 197:6 199:19 202:1 203:9.16 204:13 205:21 206:2.23 207:1 times (2) 47:21 165:15 timescale (1) 56:20 timescales (1) 20:9 timing (1) 207:16 title (2) 111:24 144:2 tmo (6) 74:4,15

2:21,21 106:7 108:22 110:18 183:8 todays (1) 1:6 together (5) 21:25 112:5 113:22 148:9 161:4 told (30) 9:1,14,15,20 16:5 32:1 45:21 47:9,10,13 50:7 51:24 53:20,22 55:5,24 69:25 70:3 3 86:25 90:24 92:11 99:12 125:8 142:2 144:7 147:15 152:11 183:8 tolerance (1) 185:7 tomas (4) 14:6,16 19:15.19 tomorrow (4) 207:20,21 208.2 7 tony (1) 205:25 too (3) 67:23 83:11 117:17 took (2) 10:19 116:18 topic (2) 137:10 204:2 topics (1) 116:8 total (7) 29:2 30:12,15,17,25 59:7 89:16 towards (3) 17:15 114:24 145:25 tower (48) 6:19,24 7:2,9 9:7 10:25 11:8 14:19 16:8 24:11 43:14 44:6 48:22 52:25 66:19 75:25 76:7 80:2.9 81:15 90:17 93:5 95:11 96:16,20,24 97:13 101:3 103:8 125:4 128:20 141:3.15.16 142:9 143:8.17 149:15.25 150:20 160:24 168:11,17 172:19,22 173:11 195:1 201:19 tp10 (1) 103:23 trace (1) 73:17 trade (2) 123:20 124:2 train (2) 141:23,24 trained (5) 10:13 141:13,20 142:3 trainee (1) 3:2 training (19) 6:9 9:24 10:1 36:2 41:1 112:22 113.1 2 114.22 116.24 119:16,20 122:11,12,16 125:23 178:17.19 194:6 transcriber (2) 1:24 109:6 transcript (8) 2:2 4:4.10.11.19.21 12:12 117:17 tray (3) 49:12,22 50:4 trays (1) 18:9 tried (1) 20:22 trigger (1) 201:25 trinity (3) 134:25 136:25 137:8 true (7) 2:17,18 18:9 109:18 110:3,6,14 trust (2) 47:22 48:1

198:9,16,23 199:21

today (8) 1:6,18

157:13,17 160:4,4

trustworthy (1) 47:24 try (8) 17:13 75:2 109:5 117:19 131:25 132:1.14 151:25 trying (8) 77:11 101:19 132:10 157:13,18,19 171:10 175:6 tuesday (1) 208:11 turn (19) 13:16,18 36:12 57:21,22 63:12 75.19 88.13 89.12 100:1 102:20 112:5 137:11 141:1 146:21 147:23 155:4,17 203:12 turning (2) 10:24 131:19 turnover (1) 137:2 twenty (2) 33:10 70:25 type (6) 54:11 70:7 113:5,6 124:9 189:15 types (1) 37:19 typical (1) 78:22 typically (2) 206:9,11

uk (2) 122:13 182:20 ukas (2) 171:24 175:8 ultimate (2) 65:10 99:15

U

ultimately (3) 31:15 57:11 65:3

unable (1) 42:3 undergone (1) 160:9 underneath (1) 177:18 understand (36) 17:19

25:19 27:23 32:2 39:1.15.22.25 42:24 45:14 54:12 55:25 77:20 85:6 92:6 95:23 127:4 140:5,6 159:8 167:4.9 187:14 195:9,16 197:11,16,18

198:8.13.20.24 199-19 25 200-4 11 understanding (19)

> 1:20 40:8.18 65:13 86:3 108:24 126:9 152:21 165:21 180:23 183:2,3,13,18,19

> 186:25 196:1 200:19 201:3

understood (1) 167:12 undertake (4) 10:1 112:22,23 129:22 undertaken (4) 121:23

172:15 198:16,23 undertook (1) 118:16 undetected (1) 186:14 unfortunately (2) 83:10

117:17 university (6) 111:1 116:1,3,7 118:17

167:8 unless (2) 9:2 91:13 unseen (2) 165:21 166:2

until (16) 24:11 116:13,23 117:11,24 118:7 125:22 126:3.18 146:20 159:10 167:7

178:19 179:21 203:23 208:10 unusual (2) 50:18 92:17 uplift (2) 18:13 78:2 usable (1) 151:3 used (48) 17:4,12 29:4 33:12.14.15.25 34:5 46:15 47:18 50:7 58:12 67:22 71:4 72:25 81:20 90:11 91:5,17,22,25 92:3,4,6,11,18 99:13 106:10 128:2 129:16 144:23 145:9 149:24 150:2.8.16 156:12 159:19 163:1 166:18 178:11 180:22 181:13.15 182:7 189:4,10 194:4 useful (1) 4:18 users (1) 186:14 uses (1) 47:10 usher (5) 63:2 105:20 107:21 170:4 208:2 using (11) 8:19 70:2 71:8 73:1 74:15 122:6 156:19 164:10 171:11 172:10 180:14 usual (10) 56:22 57:1,2,4 65:14,16 78:1 91:12,12 104:15 usually (5) 13:13 128:4 129:17 176:3 187:11 utilising (2) 53:7,25 uvalue (3) 150:24,25 151:13

updates (1) 178:17

٧ value (15) 5:19 6:6 59:15 66:14.20 67:7 68:8 71:13.23 72:13 76:8.16 79:18 100:7

101:8 various (7) 26:7 60:7 95:12 120:17 146:2 206:12.25 ve (4) 66:18,21 73:15 76:10 venice (3) 143:7.16

150:5 versa (1) 83:16 version (13) 36:19 37:16 42:17 88:15.16 161:21 173:22,24

175:14.19 177:10 205:20 206:2 versus (1) 18:14 vertical (2) 83:2 84:5 vertically (1) 165:11 via (3) 28:2 31:12 165:1 vice (1) 83:16 vinyl (1) 206:11

visible (1) 147:3 vmzinc (6) 52:10 55:20 56:5 61:15,21 69:24 voice (2) 1:23 109:5 volunteering (1) 101:22

W wales (2) 180:9.12 wall (26) 5:6 6:25 21:17,19 32:23 41:6 45:18 49:10 51:14 69:7 111:12,13,14

112:25 114:6 116:18 154:4 155:19 159:20 163:25 165:1 181:16 187:4 190:13.22 199:1 walling (7) 5:25 17:22 33:11 45:14 91:15 112:10 114:1 walls (13) 122:2 123:21

155:9,10 156:15,18,24 158:13 179:12 187:18 188:15 202:22 203:22 wandsworth (1) 143:8 wants (1) 39:4

warn (1) 196:20 warning (4) 155:21 156:4 192:24 207:9 wasnt (82) 7:4,5 10:20.20 15:2 16:12 20:2 23:17 35:3.12 42:6.11 44:10.11

45:1,20 59:15 62:14 64:4.17 67:2 68:12,16,16 74:17 78:24 85:22 90:18 92.16 93.6 97.14 104:25 114:3

117:11.24 119:20 121:14 124:5 126:18,25 127:6 129:2,9 131:23 133:20 143:14.17 146:15.16 147:14 148:24 150:15

151:22 152:13 154:2 157:8 159:10 160:16 162:25 167:6,7 168:2.9 169:11 172:11 175:11 176:15,19

183:3 184:1 188:24 189:18 190:17.18 191:6 196:2,18,24 197:5.10 198:3 203:23

wates (3) 12:17,23 way (30) 13:6 15:3 16:10 21:1 23:25

39:24 40:6 58:8 59:14 65:19 74:22 103:4 109:2 112:6 118:4,14 130:5,7 133:1 140:14 154:24 163:1 173:24 174:5,18 175:2 182:21

193:3 197:23 201:23 weathertightness (1) 78:24

web (1) 84:1 website (1) 18:10 wed (6) 157:21,21 163:2 169:12 171:7 187:9 week (5) 56:17 116:7 118:3 125:15 149:23

weeks (4) 19:2,24 21:11 67:4 wehrle (3) 152:5,8,9 welcome (1) 1:5 went (10) 5:14,16 6:15 47:12,19 58:15 73:18 102:25 167:7 203:18 werent (22) 35:23 42:8 44:14 73:15 119:22 132-25 143-21 152-11 154:9 157:5 160:12

162:23 188:20

189:19,23 190:19

191:13 193:14,18 199:15 200:23 205:10 weve (14) 24:6 27:1 36:14 52:7 53:16.20 59:4 61:16 62:4 76:9 78:8 146:2 192:14 202:15

whatever (4) 31:16 52:14 107:2 156:12 whats (3) 88:20 144:6 148-13

whenever (2) 10:19,20 whereas (3) 5:25 31:3 80:24

whereby (2) 66:2,8 whilst (3) 115:25 138:21 141:15 whole (6) 38:4 41:13

53:12 76:22 127:19 184-12 whose (3) 35:14 126:8

173:1 wicona (1) 9:9

williams (3) 74:4 83:22 84.22 willing (1) 74:9

willoughby (1) 177:25 win (1) 126:25 wind (1) 79:4 window (12) 9:8 49:10

118:18 144:5 148:17,19 149:2,2 187:23 188:3.6 192:5 windows (13) 7:5 17:21

33:11 45:14 51:14 53:2 91:15 95:5 97:24 98:13 111:14 112:9 149:6

wiped (1) 138:22 wish (1) 107:13 withdrew (1) 107:22 witness (31) 2:5 31:9

62:21,25 63:9 64:22 105:16,19 107:19.22.25 108:8 112:14 117:13 127:15

130:14 134:8 137:10 139:5 153:4 170:2,5,13 173:20 181:6.20 182:9.12

191:18 207:25 208:4 witnesses (1) 1:7 won (3) 34:7 66:3 104:18

wont (1) 120:4 wool (4) 189:6.12.14.20 wording (1) 55:9

work (53) 3:1 6:13,18 11:3,13 13:20,25 21:3 22:5 25:6 43:13 98:3 100:18 101:13 111:11 113:5 118:5 126:25 128:9 130:6.20

131:4,21 132:13,14,20 133:1,17,18 134:2 136:6,8,22 137:16 138:10 143:24 144:15 150:4 157:10,20 166:19 178:18 195:10

196.15 197:12,15,20,22,25 198:1,23 200:14 201:15

worked (31) 3:7 5:12 7:10.12 9:11 33:13,15,16 34:4,11

91:21 111:7.21.24 118:10 119:3 125:9 127:11 130:10 133:15 141:14,24 143:15,16 144:16 148:2 157:3

179:16 194:3 196:11 202:16 working (28) 4:11,14,21

5:5,16,19 6:19 19:9 56:20 64:17 87:25 113:20,22 114:5,13 115:3,25 128:5 130:11

134:24 136:12 152:24 158:19 159:25 167:5 185:19 195:13 199:19 works (16) 3:24 8:9

11:7.9.20 89:1 100:6 118:18 127:22 130:22 132:10 144:11 198:16

200:2,6,11 worse (1) 192:18 wouldnt (30) 8:2 9:20 10:12 14:22 21:25 31:22 48:16 50:18 55:7 77:24 83:9 97:15

155:1 157:3 158:6 159:12 164:20 167:12 176:24 178:13.23 179:21 186:5 193:17 195:15 199:14.16 201:6 202:14 203:20

written (3) 145:21 146:3 151:25

wrong (4) 8:13 16:6 26:15 75:3

wrote (2) 121:12,15

y (1) 25:6 yeah (59) 4:2 5:16 9:2 10:11,16 12:2 26:17 29:14 35:1 3 6 36:8 10

51:21 57:4,4 60:15 64:10 73:21 81:9.9 95:1,22 104:7 113:18 114:8 115:18 116:18 119:2 120:12 121:9

123:5 124:18 126:22 130:4 132:8,24 134:6.13 135:16.19 137:8.19 138:11 139:3 143:20 149:18 154:12

160:22 167:22 177:6,20 183:10 184:19 190:17 192:17.22 194:14

205:16 year (6) 5:15 64:19 93:13 118:25 125:5

134:10 years (5) 33:10 47:18 70:25 101:20 183:7 yep (1) 158:11 yesterday (1) 49:9

yet (4) 80:12 85:4 125:24 127:6 voud (1) 199:11

youre (30) 1:25 2:21 18:3,16 22:22 28:22 33:18 37:5 62:23 65:4 107:18 114:18 120:13,17,19 121:6 129:24 148:8.8 164:19 172:18 181:20.22 191:5,19 192:20 207:24

yours (1) 4:4 yourself (21) 1:14 10:1,1 27:22 35:10,20 68:8.19 88:10 90:15 104:22 108:13 120:8 123:23 131:8 139:1 152:23 154:18 158:22

172:21 195:3 vourselves (1) 58:25 youve (2) 8:10 27:9

zak (3) 80:5,6,8 zinc (35) 14:8.11 16:19

18:9 20:7 29:2,12,12 30:5,6,8,9 38:8,8 39:10 40:19 48:13 52:10,12 59:11 62:14 66:22 68:9,15 69:4,10 70.6 72.11 17 17

73:24 76:5 79:11 80:24 82:18

zoom (2) 110:24 155:20

0 (15) 159:6,7 160:5 167:10.11.12 180:14.25 181:3.14 182:17 183:9,10,14

184:23 **084510 (1)** 43:8

**1 (20)** 14:7,11,17 15:5 29:10 35:21 52:22 80:6,18 94:22 153:21 155:5 160:5 170:24 171:14 175:22 180:1,19 209:3,4 10 (6) 19:23 60:3 207:21 208:2,6,10

**100 (1)** 16:15 1000 (1) 1:2 1005 (1) 1:4

108 (2) 209:5,6 109000odd (1) 30:12 11 (9) 26:8 36:14 37:24

40:1 42:14,20 53:16 106:9 202:17 1126 (1) 63:5 **1127 (1)** 120:7 1140 (3) 62:22 63:4,7 **12 (5)** 30:13,14,17,25 163:21

**120 (3)** 37:19 38:3,11 123 (1) 38:3 1238 (1) 105:24 **1249 (1)** 101:13

125 (3) 155:18 156:14 165:6 **1250 (3)** 105:13,23

106:1 1254 (1) 108:3

95:20 98:10 105:18 **126 (4)** 156:16 157:11 127 (7) 159:16 167:20 129 (2) 156:16 157:11 12th (1) 118:13 13 (2) 57:7 178:1 135 (12) 122:1 156:19 14 (8) 1:1 28:19.21 43:9

135:25 14th (1) 56:18 **15 (3)** 2:12 102:24

158:8.12

175:3 176:17

157:1,12 164:13

168:8.17 171:21.25

66:14 76:10 130:14

176:18 203:10 205:22

170:24 173:25 174:19

16 (3) 31:10 120:7

145:15 160000 (1) 82:2 16th (1) 145:23

17 (4) 145:23,24 204:16,17 17th (1) 145:14

18 (21) 7:3 15:16 19:7 41:6 45:5 63:16.19 109:12 158:3,5 161:6 163:4 171:16 173:23

174:6 181:13 189:20.24 192:19 204:16.22

18750 (1) 21:18 18m (5) 159:17 162:5 163:24 164:1 188:16 19 (2) 49:16 109:21 **190 (1)** 60:18

**1983 (1)** 3:2

1994 (1) 3:5

2 (30) 11:6 17:13.15 19:24 28:25 37:15 45:12 50:25 51:2 52:19 58:20 80:18 20 94:2,19 107:25 108:2 109:22 115:23 125:1 127:16 148:4.13 170:21,24 171:18 172:8 180:1,19 185:1 20 (2) 49:6 53:21 **200 (1)** 108:5 200000 (1) 82:2

2003 (3) 111:2 202:23 203:14 200380 (1) 81:19 **2006 (2)** 113:17 114:6 2008 (1) 43:9

2010 (2) 117:3 152:24 2011 (2) 179:11 193:9 2012 (4) 145:15,23,24

148:6 2013 (25) 5:6,8 6:5 13:20 14:1,7 15:5,16 16:6 18:25 19:16 22:11 25:6 26:2,8 27:2 36:20 37:12 38:21 49:6 63:19 135:1

154:7 205:21.24 2014 (51) 28:19.21 29:25 43:19 44:22 46:6 51:4,20 52:17,21

58:21 66:14 74:3.19

	i	i	1	
75:21 77:7 78:13,16	<b>40 (5)</b> 98:8,14			
79:13 80:7 81:14	158:14,17 159:5			
82:11 83:19,21 85:11	40000 (1) 81:25			
	<b>4076 (1)</b> 100:7			
86:19 87:6 88:15				
89:13 92:25 93:9,14	419000 (1) 81:11			
94:6 96:2,8 100:2	<b>430 (1)</b> 208:9			
102:4 116:3 118:8	<b>476 (1)</b> 180:20			
119:1 134:11,17	<b>4767 (3)</b> 120:19			
136:18 161:8 170:18	121:10,15			
173:24 175:14 177:24	<b>4i (1)</b> 97:21			
178:1,4 193:12	4millimetre (1) 54:4			
<b>2015 (18)</b> 102:21,24	4mm (2) 53:7,25			
103:2,9 120:7 125:22				
134:12,16 135:1,2	5			
136:18 161:22 162:2				
170:19 175:16 179:21	<b>5 (4)</b> 92:25 114:4			
191:4 193:12	136:19 187:20			
<b>2016 (4)</b> 125:23 135:2	<b>50000 (1)</b> 5:20			
137:14 138:5	<b>50945 (2)</b> 100:8 101:8			
2017 (1) 116:3	<b>50year (1)</b> 79:5			
<b>2018 (2)</b> 2:6 109:11	<b>546000 (1)</b> 30:14			
<b>2019 (2)</b> 109:21 110:9	546000odd (1) 30:17			
<b>2020 (2)</b> 1:1 208:11	<b>546264 (1)</b> 29:3			
<b>21 (5)</b> 21:11 22:11 46:6	<b>55 (1)</b> 87:25			
52:17,21	<b>551000odd (1)</b> 30:9			
22 (6) 41:25 74:3,19	<b>576 (1)</b> 82:19			
77:7 206:5,7	576000odd (2) 72:7			
<b>23 (7)</b> 43:19 80:7	81:8			
83:19,21 100:2 144:6				
148:6	6			
<b>23250 (1)</b> 21:20				
<b>24 (8)</b> 75:21 94:6,9,19	<b>6 (10)</b> 42:1 51:4,20			
95:14 96:2,8 104:9	127:15 128:14 180:20			
	188:10,11 190:4 202:4			
<b>240 (1)</b> 60:17	<b>63 (2)</b> 37:24 38:12			
<b>25 (4)</b> 81:14 82:11				
86:6,19	<b>64 (2)</b> 37:18,19			
<b>259000 (1)</b> 81:11	641 (1) 206:7			
25millimetre (1) 103:22	<b>642 (1)</b> 206:10			
<b>27 (1)</b> 181:6				
<b>28 (1)</b> 182:11	7			
<b>29 (9)</b> 29:25 36:20				
37:12,17 42:17 56:14	<b>7 (8)</b> 12:14 19:16 27:2			
57:23 58:21 73:7	97:19 115:22 180:20			
293368 (1) 74:12	182:12 204:7			
	707000odd (1) 30:10			
	<b>7113 (2)</b> 202:18 203:8			
3	7114 (1) 203:1			
	<b>73 (2)</b> 88:18 179:11			
<b>3 (16)</b> 13:19 25:3 49:4	<b>750000 (1)</b> 5:20			
51:1,3,5,7 73:8 130:15	776 (1) 88:18			
137:12 138:20 170:25	110 (1) 00:18			
171:23 172:13 174:1				
180:19	8			
<b>30 (6)</b> 78:13,16 79:13				
87:6 97:18 191:18	<b>8 (10)</b> 2:6 11:5 22:12,13			
	33:8 64:22 90:1			
<b>31 (2)</b> 33:7 70:24	109:11 161:22 162:2			
<b>319 (1)</b> 170:9	<b>83 (1)</b> 139:7			
32 (1) 59:9	<b>8414 (10)</b> 120:24			
<b>3200 (1)</b> 23:10	156:20 157:1 168:8,17			
<b>33 (2)</b> 34:3 173:21	171:21 172:9 176:18			
<b>335 (3)</b> 169:23 170:8,11	190:10 191:5			
<b>35 (2)</b> 63:13 64:23	841422005 (1) 120:18			
3500m2 (1) 23:11	071722003 (1) 120:10			
376000odd (1) 81:7				
<b>376175 (1)</b> 74:12	9			
<b>37850 (1)</b> 81:22	0 (40) 45			
	<b>9 (13)</b> 13:19 25:2,5 30:3			
	59:4 89:14 98:8 110:9			
4	125:2 134:8,21 169:3			
	202:4			
	0102 (1) 04 4	I	Ī	1
<b>4 (15)</b> 18:1 31:10 66:22	<b>9103 (1)</b> 84:4			

96:17 110:23,25 112:14 113:14 114:4

130:16 135:25 146:21

180:20 186:6 187:17

**93 (1)** 155:4

**95 (1)** 155:17

96 (1) 159:15 97 (1) 158:17