# OPUS<sub>2</sub>

Grenfell Tower Inquiry

Day 170

September 7, 2021

Opus 2 - Official Court Reporters

Phone: +44 (0)20 3008 5900 Email: transcripts@opus2.com Website: https://www.opus2.com

1	Tuesday, 7 September 2021
2	(2.00 pm)
3	SIR MARTIN MOORE-BICK: Good afternoon, everyone. Welcome
4	back to the Inquiry hearings.
5	I'm very glad to say that, with the relaxation of
6	the COVID restrictions, we are now able to invite
7	members of the public to come and see our work, and so
8	we look forward to hearing and seeing those who may want
9	to come and hear what we're doing over the next few days
10	and weeks.
11	Today we're going to hear evidence from
12	Dr Barbara Lane, one of the experts instructed by
13	the Inquiry.
14	So, if Dr Lane is there, would you ask her to come
15	in, please.
16	DR BARBARA LANE (sworn)
17	SIR MARTIN MOORE-BICK: Thank you very much. Do sit down
18	and make yourself comfortable, please.
19	(Pause)
20	Yes, Mr Millett, when you're ready.
21	Questions from COUNSEL TO THE INQUIRY
22	MR MILLETT: Mr Chairman, thank you very much, good
23	afternoon. Good afternoon, members of the panel.
24	Dr Lane, good afternoon to you. Thank you very much
25	again for attending the Inquiry on I think what is your

1		fifth occasion to assist us with your opinions.	
2	Α.	Yes.	
3	Q.	My questions are intended to be short and simple;	
4		sometimes they don't turn out that way, so if you want	
5		me to rephrase the question or put it in a different	
6		way, please just ask me.	
7		Also, if you need a break at any point other than	
8		the scheduled break that we will take during the middle	
9		of the afternoon or so, please let us know.	
10	Α.	Yes.	1
11	Q.	Now, you have prepared a report for Module 3 of Phase 2	1
12		of the Inquiry entitled, "The management and maintenance	1
13		of Grenfell Tower"; is that right?	1
14	Α.	That's correct.	1
15	Q.	It's broken down, I think, into some 11 chapters.	1
16	Α.	Yes.	1
17	Q.	What I'm going to do is just read the chapter numbers	1
18		and references into the record so that everybody can	1
19		find them if they need to, so bear with me if you would.	1
20		The first is $\{BLARP20000023\}$ , "The Regulatory Reform	2
21		(Fire Safety) Order 2005 and its application to	2
22		high-rise residential buildings". That's chapter 1 of	2
23		your report, isn't it?	2
24	Α.	That's correct.	2

 $25 \quad \ \ Q. \ \ And \ chapter \ 2, \ is \ this \ right, \ is \ at \ \{BLARP20000024\},$ 

2

	1		"Organising and planning a system of management that
	2		provides the fire safety arrangements required by the
ne	3		RRO(FS)O", or RRO, as we shall call it?
	4	Α.	Yes, that's correct.
	5	Q.	Then at {BLARP20000029}, "The fire safety arrangements
	6		made by the KCTMO", that's chapter 3; yes?
	7	Α.	Correct.
	8	Q.	Is it right chapter 4 is at {BLARP20000030}, "KCTMO's
	9		duty to provide protection measures to support the means
	10		of escape – fire doors"?
	11	Α.	Yes, that's correct.
	12	Q.	Then chapter 5 at {BLARP20000031}, "KCTMO's duty to
	13		control the hazards from building works and
	14		alterations"; yes?
	15	Α.	Correct.
	16	Q.	Then at {BLARP20000034}, "KCTMO's duty to provide
'n	17		adequate fire protection for vulnerable persons", that
	18		is chapter б.
	19	Α.	That's correct, yes.
	20	Q.	Chapter 7 is at $\{BLARP20000033\}$ , "KCTMO's duty to
	21		provide a suitable system of maintenance for fire
	22		protection measures".
	23		Yes.
	24	Q.	Then chapter 8 at {BLARP20000027}, "The adequacy of the
	25		advice provided by the fire risk assessor Carl Stokes of
			3
	1		CS Stokes & Associates Ltd to the KCTMO".
	2	Α.	Correct.
	3	Q.	Then chapter 9 at {BLARP20000028}, "KCTMO's duty to
	4		create a system of emergency planning $-$ the resulting
	5		emergency plan for Grenfell Tower".
	6		Correct.
	7	Q.	And then chapter 10 at $\{BLARP20000032\}$ , "The external
	8		wall construction $-$ the hazard it posed to relevant
	9		persons".
	10		Yes, correct.
	11	Q.	Finally, chapter 11, "Conclusions", at {BLARP20000040}.
	12		Correct.
	13	Q.	Yes.
	14		Now, you have had cause to revisit the number of
	15		individuals that you have counted as vulnerable in
	16		chapter 6, I think, since you wrote that report.
	17		Yes, that's correct.
	18	Q.	As a result of your review, is it right that you have
	19		increased the number of adults that you have counted as
	20		vulnerable?
	21		That's correct.
	22	Q.	Yes, and that will be set out, I think $$ is this
	23		right? $$ in a second version of chapter 6, section 14,

- 24 which will be finalised soon and disclosed to core
- 25 participants?

- 1 A. Yes, that's correct.
- 2 Q. Yes, thank you.
- 3 Apart from those amendments to those aspects of
- 4 section 14 of chapter 6 that you propose to make in due
- 5 course, are the factual matters set out in your report
  - true to the best of your knowledge and belief?
- 7 A. Yes. they are.

- $\mathsf{Q}.\;$  Yes. Can you confirm also that the report sets out your 8
- 9 true and complete professional opinion on the matters
- 10 that you have addressed in it?
- 11 A. Yes, it does.
- 12 Q. Yes. Can you confirm also that you have understood your 13 duty to the Inquiry as an expert to the Inquiry and that
- you have complied with that duty? 14
- 15 A. Yes, I have.
- 16 Q. In particular, have you given the evidence and opinions 17 set out in your report in the same ways that you would 18 to a court and abided by the same principles?
- 19 A. Yes. I have.
- 20 Q. Now, your report stands as your evidence to the Inquiry.
- 21 Having addressed some matters of context, my questions
- 2.2 are going to focus principally on those matters which,
- 23 in respect of your report, are truly ones of expert
- 24 opinion, and where there have been material developments 25
  - in the evidence given to the Inquiry since your reports

5

1		as well, and I'm going to focus on the points of
2		relevant controversy; do you understand?
3	Α.	I think so. Well, am I allowed to ask a question,
4		sorry? So when you say expert opinion, just my normal
5		opinion here based on the work I have done?
6	Q.	Yes, exactly.
7	Α.	Okay, yes. Okay, understood, yes.
8	Q.	Yes, thank you.
9		Can I start by asking you some questions about your
10		qualifications and experience.
11	Α.	Yes.
12	Q.	You have given some details of your relevant
13		qualifications and experience in the introduction to
14		your Phase 1 report in April 2018 $$
15	Α.	Yes.
16	Q.	—— paragraph 1.1.
17	Α.	Yes.
18	Q.	I'll just read the reference: that's $\{BLAR00000001/6\}.$
19		To that report, you appended your CV as appendix A at
20		{BLAR00000016}. I'm going to look at that in a moment.
21		Before I do, I just want to read another document
22		into the record. You have given us a further document,
23		which is at {BLARP20000041}, which sets out your current
~ 1		

- roles at Arup and your specific experience in respect of 24 25
  - fire risk assessments; is that right?

6

- 1 A. Yes, that's correct.
- 2 Q. Yes.
- 3 Now, before I go to that document, I want to ask one
- 4 or two questions about your CV which you appended to
- 5 your Phase 1 report from April 2018.
- A. Yes. 6

8

- Q. That's at {BLAR00000016}. Can we have that up, please. 7
  - There is page 1. Can we go to page 5
- 9 {BLAR0000016/5}.
- 10 On page 5, you will see a heading, "Current Arup
- 11 roles".
- 12 A. Yes
- 13 Q. In the first paragraph there, it says:
- 14 "Director of Ove Arup & Partners Ltd. - global fire
- 15 safety engineering technical Leader for 228 fire
- 16 engineers. 83 of whom are based in the UK."
- 17 A. Yes
- 18 Q. Is it right that from April 2021, this year --
- 19 A. Yes
- 20 Q. -- you were no longer carrying out those roles?
- 21 A. That's correct. I have a whole new set of roles in
- 22 Arup.
- 23 Q. A new set of roles?
- 24 A Yes
- 25 Q. We will look at those in a moment.

#### 7

- 1 To what extent did those roles that you have 2 identified there on the page we're looking at involve 3 carrying out fire risk assessments under the RRO? 4 A. Well, it's as I've set out in my latest, more specific 5 fire risk assessment CV. 6 Q. Right. So those activities fell within the scope of 7 your role as a director? 8 A. Oh, no, sorry, no, no, no. So my role as a fire safety 9 engineer working on projects --10 Q. Right. 11 Α. I carry out fire risk assessments. 12 Q. Thank you, I see. 13 A. And despite -- regardless of any corporate role at 14 Arup -- so I have new corporate roles at Arup now --15 I still work on projects as a competent fire safety 16 engineer Q. Yes, and to what extent did those roles, in relation to 17 18 fire risk assessments particularly, involve quality 19 assessment? 2.0 A. So my experience of quality assessment is both as 21 a project director for projects at Arup, for fire safety
- 22 engineering projects, where we do -- we have -- it's our
- 23 own work, so where the fire practice has a commercial
- 2.4 project on its own. But I also do quality assurance
- 25 checks and I'm involved in project reviews and more

1		extensive reviewing, as a director of the firm, on
2		multidisciplinary projects that Arup would produce. And
3		in the last two years particularly , because I was
4		a member of the region board of Arup, which is $$ it's
5		like a management executive, really, I was responsible
6		for advising the COO, who is our responsible person, on
7		how to comply with his duties.
8	Q.	Right. I see.
9		Now, can we go to {BLARP20000041}, which is the
10		further document that you've now provided to us. We'll
11		just have the first page of that up. That's the first
12		page there.
13		Can we go to page 6 in that $\{BLARP20000041/6\}$ ,
14		please. If you look at the top of that page, you can
15		see that it says:
16		"Current operational roles at Arup Group Ltd.
17		"Since 1st April 2021 my operating roles in Ove Arup
18		$+\ensuremath{{\rm Partners}}$ Ltd came to an end, and I commenced new
19		operational roles for the Arup Group Ltd, and have
20		various new responsibilities in that regard."
21		Then you've set them out underneath that.
22	Α.	Yes.
23	Q.	To what extent do those roles that you have set out
24		there involve either carrying out or quality assessing
25		fire risk assessments?

1	Α.	Oh, quality assessing fire risk assessments. Okay, so
2		it 's important to $$ all my fire work is done as
3		a project director in Arup Fire, and that's
4		an additional role to my quite $$ they're quite senior
5		corporate roles . Okay?
6	Q.	Right.
7	Α.	But I have quite a substantial role $$ I wasn't planning
8		on talking about that today, actually, but in the roles
9		listed here, by being the director of the Arup
10		University, I'm responsible for the learning provision,
11		the skills provision and knowledge transfer processes in
12		the whole of the Arup group, which is the UK and the
13		whole company, and I also have responsibility for
14		certain risk zones in our own risk profiling exercise
15		for our own business.
16	Q.	Right. Does that role in the learning provision, skills
17		provision and knowledge transfer process include
18		knowledge and understanding of how to carry out a fire
19		risk assessment under the RRO?
20	Α.	Yes, it does, because we have a large number of
21		fire safety engineers, and I myself am, you know,
22		a full-time fire safety engineer.
23	Q.	Yes, thank you.
24	Α.	So I hope that's $$ I'm not entirely sure I'm answering

25 your question.

10

- 1 Q. Yes, you have, thank you.
- 2 A. Okay.
- 3 Q. We can answer it further, I think, by going to page 4 of
- this document {BLARP20000041/4}, if we can. 4
- A. Okay. 5

7

8

9

- Q. If we go to the introduction, page 4, in the fourth 6
  - paragraph down you say:
    - "I have been carrying out ... "
  - Do you see?
- 10 A. Yes.
- 11  $\mathsf{Q}.~$  "  $\ldots~$  fire ~ risk assessments since my career started at
- 12 Arup in 1997, and I have latterly also been responsible
- 13 for the detailed checking and approval for issue, under
- 14 our quality management system, for fire risk assessments
- 15 produced by staff at Arup also."
- 16 A Yes
- 17 Q. Just one question on that.
- 18 You say latterly you have been responsible for
- 19 checking and approving FRAs --
- 20 A. Yes
- 21 Q. -- produced by Arup staff. Since when and in what role 2.2 have you been doing that?
- A. Well, the more senior you get, the more work of others 23
- 24 you become responsible for, rather than just self-check.
- 25 I have no idea what year I became a formal approver at

11

- Arup, it's a very long time ago.
- 2 Q. Right.

1

- 3 A. I can confirm the year somehow.
- 4 Q. So when you say "latterly", when are you referring to? 5 Do you just mean after 1997?
- 6 A. No, I think I was just trying to communicate that your
- 7 role  $\,--\,$  your responsibilities expand beyond your own
- 8 work only, where you are very intimately involved, and
- 9 increasingly there is an expectation and a requirement
- 10 to also, on top of your own work, your own projects,
- 11 make sure the work of others is fit for purpose. So it
- 12 wasn't meant to mean I did one thing and now I'm doing
- 13 another; I do both, but my responsibility for other
- 14 people is much more than it was when I first started
- 15 work.
- Q. Yes, I see. It's just I wanted to understand what you 16 17 meant by "latterly" there. Do you mean recently --
- 18 A. Well, I wish I hadn't put that word in now, because it
- 19
- wasn't meant to have a great meaning, other than the 2.0
- more senior you are at Arup, the more work of others you 21 are responsible for, and that requires, you know,
- 22 a proper understanding of what a quality assurance
- 23 system is and being able to utilise it.
- 24 Q. In any given year in the period to which you're
- 25 referring there, how often would you check and approve

September 7, 2021

25

1		an FRA produced by your staff?
2	A.	I have no idea. I would say to you, not at
3		a public inquiry, endlessly.
4	Q.	Right.
5		But I don't know how many. I have no idea. I work very
6		long hours, endlessly checking and approving the work of
7		others, and being responsible for the very complex risk
8		assessments I do myself.
9	Q.	You are likely to give a similar answer to my next
10		question.
11	A.	Okay.
12	Q.	So forgive the question.
13	Α.	Yes.
14	Q.	If you go down to the next paragraph, you say:
15		"Since 2009 I have spent the substantial portion of
16		my professional time working on existing buildings,
17		refurbishments, and therefore occupied premises,
18		including construction sites within occupied premises.
19		In particular since 2011, the majority of my
20		professional time was spent on projects within the
21		framework of the Regulatory Reform (Fire Safety) Order
22		2005; and equivalent legislation ."
23		As I say, forgive the question $$
24	Α.	Yes.
25	Q.	but what do you mean by "the substantial portion"?

13

1	Α.	Yes, okay. So I was just trying to make the point
2		there $$ so I think $$ I'm aware that there is this
3		perception of Arup and Arup Fire that we specialise in
4		design and, you know, say, quite theoretical work, and
5		I wanted to make the point here, because I'm aware,
6		you know, of people querying my expertise, that
7		I personally have, as I understand it from other people,
8		quite unique experience, because l've done so much work
9		in construction, in construction in occupied buildings
10		and on refurbishment, and providing advice to clients
11		where it's in the occupied building condition, not in
12		those really early stages when one deals, you know,
13		particularly with an architect. So I just wanted to
14		draw that experience that I have out.
15	Q.	Yes, thank you.
16		Now, in the last paragraph on that page, you say:
17		"My experience spans across multiple sectors, and
18		includes both public and private sector clients . I have
19		selected projects below, where I had a particular role
20		in fire risk management system analysis as well as
21		technical fire risk assessment activity, in premises
22		with a sleeping risk and with vulnerable people."
23		Do the selected projects that you have listed $$ and
24		we'll come to those in a minute $$ represent the
25		totality of the projects where you have carried out that

14

1		activity or only a selection, a proportion?
2	Α.	They don't represent the totality .
3	Q.	Right. Can you give us some idea of the proportion?
4	Α.	No, I've never sat down and calculated it, I'm really
5		sorry.
6	Q.	Let's look at page 7 $\{BLARP20000041/7\},$ then, and some
7		of those selected projects.
8		If we go to page 7 of this document and go to the
9		heading "2011–2017 Portfolio of multiple high rise
10		residential (dwellings) buildings".
11	Α.	Yes.
12	Q.	It's the second section down. It says:
13		"Fire risk assessments 2013–2014.
14		"Independent review of existing fire risk
15		assessments including the significant findings and
16		action plans.
17		"Production of a new full fire risk assessment for
18		each building, based on a detailed inspection of the
19		active and passive fire protection measures."
20		Again, forgive the question in light of what you
21		have already told us, but can you tell us roughly even
22		how many fire risk assessments you carried out on
23		high-rise residential buildings before 14 June 2017?

24 A. I've no idea. There were 17 buildings here,

# for example.

# 15

1	Q.	So no idea because it's a lot; is that the $$
2	Α.	Well, I don't know if it's a lot by other people's
3		standards, but I think I've worked on very many
4		high-rise residential buildings.
5		Actually, I probably should just say something.
6		I don't think the number of is important, it's more the
7		complexity and the work that I did. $\$ I don't agree that
8		chugging things out makes you more experienced or
9		competent.
10	Q.	No.
11	Α.	So I'm not able to confirm. If someone needs me to do
12		an analysis of everything I've ever done at Arup and
13		confirm percentages, I'm happy to do that.
14	Q.	No, that's all right.
15		If we go to page 9 {BLARP20000041/9}, please, you've
16		listed two projects at the top of the page there.
17	Α.	Yes.
18	Q.	"2012 Purpose built blocks of flats, England (south
19		coast)"
20	Α.	Yes.
21	Q.	and "2012–2017 Purpose built block of flats, England
22		(north west)".
23	Α.	Yes.
24	Q.	Can you just clarify what work you were doing on those
25		particular projects?

- 1 A. The one in 2012 was to do with the construction of the
- 2 single escape stair and how the relevant persons were
- 3 utilising the public spaces available in those
- 4 buildings.

6

7

8

- Q. Right.
- A. As well as complex matters of fire doors that had various defects to them.
- I'm just trying to think what else. I think that was about the extent of that.
- 9 was about the ex 10 Q. I see.
- 10 Q. Tsee 11 A. Yes.
- 12 Q. What about the second set of buildings, is that the
- 13 same
- A. That was to do with the external wall, the structure of
   the building and the vulnerability of the persons living
   there
- 17 Q. Right. What was it about the external wall, do you 18 recall?
- A. I very much recall. I think the best way to describe it here is that it was of very poor construction standard.
- 21 There was no ACP or anything like that, just to be
- 22 absolutely clear. It was of a very poor construction
- 23 standard, and combined with serious concerns about the
- 24 overall structural stability of this purpose-built block
- 25 of flats, in combination with problems with faulty

17

1 internal compartment walls, faulty fire doors, and a few 2 other issues, altogether it was quite an extreme 3 situation . 4 Q. Did those projects involve carrying out fire risk 5 assessments for the purposes of the RRO? 6 A. Absolutely. 7 Q. They did? 8 A. Yes. 9 Q. Have you carried out fire risk assessments on existing 10 purpose-built blocks of flats such as Grenfell Tower? 11 A. I have never carried out a fire risk assessment on 12 a block of flats built in 1971, no. Q. You say built in 1971. That's quite a specific --13 14 A. Oh, sorry, no. Sorry, that wasn't meant to be sinister. 15 No. that was -- no. I haven't. 16 Q. Right. 17 A. But, sorry, just again, I think that I've carried out 18 very many risk assessments on all different types of 19 buildings, and I think I'm very familiar with 2.0 residential buildings, and  $l^\prime m$  not aware that there are 21 different rules for different types of residential 2.2 buildings. 23 Q. Yes 24 Now, I'll just mention this rather than taking you 25 to the part of your report. In your report at chapter 1 18

- 1 at paragraph 1.2.2 -- I had better show it to you, it's
- 2 a quotation.
- 3 A. Yes.

5

- $4 \qquad {\sf Q}. \ \ {\sf It's \ at \ } \{{\sf BLARP20000023/8}\}.$ 
  - At paragraph 1.2.2 there, halfway down the screen,
- 6 you refer to Mr Todd's reference and reliance on
- 7 PAS 79:2012.
- 8 A. Yes.
- 9 Q. And you say:
- 10 "This includes carrying out fire risk assessments of
- 11 high rise residential buildings with combustible
- 12 materials in the external wall construction."
- 13 A. Yes
- 14~ Q. Can we take it that you're very familiar and have in
- 15 your work been very familiar with PAS 79?
- 16 A. Yes, you can.
- 17  $\,$  Q. Is PAS 79, or rather was PAS 79 as at June 2017, the
- 18 leading guidance for fire risk assessors when carrying 19 out fire risk assessments?
- 20 A. I think it's the most robust publication available to
- 21 people carrying out fire risk assessments to get
- 22  $\hfill a$  really clear understanding of what needs to be done,
- and I tend to rely on it as a checklist or, you know,
- $24 \qquad \qquad {\sf quality \ check \ of \ my \ own \ work \ to \ make \ sure \ I \ haven't}$
- 25  $\,$  forgotten anything, and I really like the risk level  $\,$

19

1 estimator particularly in PAS 79. 2 Q. Right. So would you say that any fire risk assessor who 3 relied on it wouldn't be going far wrong? 4 A. I think that there's -- you know, I don't think using a pro forma as presented in PAS 79 automatically means 5 that, you know, one can then add on all sorts of very 6 7 positive effects. I think it's one part of the work 8 needed to produce a fire risk assessment. 9 Q. My question wasn't designed. I think, to elicit whether 10 or not it was an adequate checklist exercise, but simply 11 that the principles contained in it are principles 12 which, if followed, meant that you wouldn't be falling 13 into error as a fire risk assessor. 14 A. No. sorry. I think that it describes the classic 15 five-step health and safety risk assessment process in 16 a much more, you know, expansive way for fire risk 17 assessments. 18 Q. Yes. 19 A. And if, you know, you do what it says, and don't think 20 any further, most of it will help you get there, yes. 21 Q. Yes, okay, that's helpful. 2.2 Can I then turn to a different topic, which is the 23 duty to undertake a fire risk assessment and its 2.4 purpose 25 Do you agree that Article 9(1) of the RRO imposes

September 7, 2021

- 1 a requirement on the responsible person to make
- 2 a "suitable and sufficient" fire risk assessment?
- 3 A. Yes, I do.
- 4 Q. Yes. Now, the term "suitable and sufficient" is not
- 5 defined in the RRO, is it?
- 6 A. No.
- 7~ Q. No. Do you happen to know where it comes from?
- 8 A. Well, my understanding of where it comes from is I think
- $9 \qquad \ \ \,$  it 's from the management regulations, and when I try to
- $10 \qquad \mbox{ understand what that means for me, I always refer to the }$
- 11 general health and safety publications written by the
- 12 HSE. They tend to give advice about what "suitable and
- 13 sufficient " could mean, but there is nowhere where
- 14 there's a formal definition of it.
- Q. When you say the management regulations, do you mean the
   management regulations promulgated under the health and
   safety legislation --
- 18 A. Yes.

25

- 19 Q. -- before the RRO came into being?
- A. From memory, I think it's -- just because I don't have
  everything in front of me. It's definitely in 1999 and
- 22 I think it's in 1992. I'd need to check. Yes.
- 23 Q. Thank you.
- 24 Now, given that the term "suitable and sufficient"
  - isn't defined in the RRO, how would a responsible person

21

- 1 go about working out whether its fire risk assessment is 2 suitable and sufficient ?
- 3 A. Yes. So I think probably the easiest way to do that is
- 4 to use something like PAS 79 as a check, but there's
- 5 always a certain portion of, you know, premises—specific 6 issues that the responsible person and the fire risk
- issues that the responsible person and the fire riskassessor will have to exercise, you know, judgement
- 8 beyond the checklist in PAS 79.
- 9 Q. Yes, thank you.
- 10 Would you agree that a fire risk assessment done by
- 11 or on behalf of a responsible person should give
- 12 consideration to each of the matters set out in
- 13 Article 4 of the RRO?
- 14 A. In Article 4 ...
- 15 Q. Let me give you a shopping list.
- 16 A. Yes.
- 17 Q. Measures to prevent the outbreak of fire.
- 18 A. Oh, the general fire precautions. Sorry, okay, I'm not
- 19 as --I don't whizz around the articles.
- 20 Q. Sorry.
- 21 A. So will you just ask that question again?
- 22  $\,$  Q. Yes. Would you agree that a fire risk assessment done
- 23 by or on behalf of a responsible person ought to
- 25 fire?

Opus 2

Official Court Reporters

22

- 1 A. Yes.
- $2 \quad {\sf Q}. \ \ {\sf Second, \ compartmentation, \ firestopping \ and \ fire \ doors?}$
- 3 A. Measures to, sorry -- yes, it needs to look at it.
- 4 Sorry, I don't actually really understand what you mean.
- 5 Q. I'm really just seeing if we can agree the scope of ---6 A. The scope. So are you asking me about protection
- A. The scope. So are you asking me about protection
   measures that a fire risk assessor should look at wh
- 7 measures that a fire risk assessor should look at when
- 8 trying to deal with Article 4? 9 O Let me try it differently
- 9 Q. Let me try it differently .
   10 Would you agree that Article 4 would include looking
- 11 at compartmentation?
- 12 A. Yes.
- 13 Q. And looking at firestopping?
- 14 A. Yes
- 15 Q. Looking at fire doors?
- 16 A. Yes.
- 17 Q. Yes, and then the rest of the list would include things
- 18 like emergency escape lighting?
- 19 A. Yes.
- 20 Q. Yes?
- 21 A. Yes.
- 22 Q. Fire exit signage?
- 23 A. Yes, in certain places, yes.
- 24 Q. In certain places, yes. Smoke control?
- 25 A. If it's there, yes.

## 23

- $1 \quad Q. \ \ \text{If it's there.} \ \ \text{Fire extinguishers?}$
- $2\,$   $\,$  A. Not normally in public areas. Again, it depends what's
- 3 in the building. Yes.
- 4 Q. Right. Fire detection and fire alarm systems?
- 5 A. It depends where it is.
- 6 Q. Right.
- 7 A. Yes.
- 8 Q. Appropriately disseminated fire safety procedures?
- 9 A. Yes.
- 10 Q. Yes. Instruction and training of employees in
- 11 fire safety?
- 12 A. Where relevant.
- 13 Q. Where relevant. Arrangements for the management of
- 14 fire safety?
- 15 A. Yes.
- 16 Q. Yes. Have I missed anything out?
- 17 A. Well, I'm afraid to say yes or no.
- 18 Q. All right. I may have done.
- 19 A. Yes. So obviously I think -- on a more serious note,
- $2\,0\,$  I think I've been very clear in my report about the
- 21 basic principles and then the more detailed
- 22 protection -- protective and protective measures I would
- 23 expect and I've relied on.
- 24 Q. Yes.

25

Forgive me for saying this, and I should have said

24

transcripts@opus2.com +44 (0)20 3008 5900

- 1 this at the beginning, but your report is of course
- 2 quite long, and some of the questions I'm asking you are
- 3 really designed to summarise for people listening to
- 4 this exercise --
- 5 A. Yes.

- Q. -- what's in it so that they can understand it. 6
  - A. Understood, and my report's very long because I was given such extensive evidence to review.
- 8 9 Q. We are very grateful for every word of it.
- 10 A. You're welcome.
- 11 Q. Now, on those matters on the shopping list that we've 12 just discussed, should they be specific to the building 13 under assessment? In other words, you take your
- 14 building you're assessing and you go through that list?
- 15 A. Yes, exactly. So it's a bit like when we were speaking
- about PAS 79. I think every building is meant to come 16 17 equipped with the set of fire safety provisions, so say
- 18 you take whatever's been provided under the
- 19 Building Regulations, whatever year that was, and you
- 20 need to understand what your building-specific
- 21 fire safety provisions are. They're not the same in
- 2.2 every building, even across residential buildings, so
- 23 it's important to understand the premises-specific
- 24 information.
- 25 Q. Yes

## 25

- 1 A. And that's why the pro forma in PAS 79 is useful, but there may be something else for your building that you 2 3 have a duty to notice and include.
- 4 Q. Yes, thank you.
- Now, bearing in mind PAS 79 and its contents, and 5 for the technicians here, specifically, as yourself, 6
- 7 page 18, clause 5(i)  $\{\mbox{CTA00000003}/18\}$  -- we don't need
- to look at it -- do you agree that a fire risk 8
- 9 assessment should do four things particularly : first .
- 10 express the current level of risk?
- 11 A. Yes
- 12 Q. Yes. Second, determine the adequacy of existing fire 13 precautions?
- 14 A. Yes
- 15 Q. Third, determine the need for and the nature of any
- 16 additional fire precautions?
- 17 A. Yes
- 18 Q. And fourth, then set out any additional fire precautions
- 19 required in the action plan?
- A. Yes, I do, yes. 2.0
- 21 Q. Would an FRA need to do anything else in order to count 2.2 as suitable and sufficient, do you think?
- 23 A. Sorry, I'm just struggling a little bit with what you
- 24 mean. I mean, it needs to explain all sorts of
- 25 different things like the evacuation plan, explain about

26

- 1 the fire safety management system. Is that what you mean? So there's other features beyond physical
- 2 3 features -
- 4 Q. Right, I see.
- 5 A. -- that a fire risk assessor has to consider.
- Q. I see. And you say that includes fire risk --6
- 7 A. Management.
- 8 Q. -- safety management?
- 9 A. Yes, so there's the physical aspect of the work, you go 10
- to the building, you see the fire safety provisions, so 11
- what the building comes with, how it's being used, what 12 hazards are introduced by the use of the building, and
- 13 then there's non-physical matters to do with fire safety
- 14 management and, you know, how these matters are dealt
- 15
- 16 Q. Yes, I see. We're going to come to fire safety
- 17 management later in your evidence --
- 18 A. Yes. ves. ves.

with.

- 19 Q. -- but I'm grateful for that addition to the list of
- 20 things I've referred to.
- 21 Can we then turn to the question of competence,
- 22 competence of fire risk assessors to carry out FRAs.
- 23 Again, do you agree that, under Article 9(1), indeed
- 24 any part of the RRO, there is no specific requirement 25
  - that a fire risk assessment should be carried out by

27

- 1 a specialist? A. By a specialist? 2 3 Q. Yes. A specialist fire risk assessor, for example. 4 A. That there's no requirement to appoint a -- well, 5 I mean -- well, what's a specialist? 6 Q. Well, someone who --7 A. Very competent. 8 Q. -- knows how to do a fire risk assessment. 9 A. Oh, okay. Well, that's a different matter, isn't it? 10 So I think that the use of the word "competent" 11 isn't used in the order, in the article about fire risk 12 assessments, I think, if that's what you're asking me, 13 and it is used elsewhere. I don't know why any -- I'm 14 just struggling a bit about why legislation would ask 15 for specialists anywhere. 16 Q. Well, you've answered both of the next questions I had. 17 A. Oh, okay, yes. 18 Q. I think you agree there is no provision in the RRO which 19 requires that an FRA should be carried out by 2.0 a competent person? 21 A. I can only agree that the article dealing with fire risk 2.2 assessment makes no mention of the word "competence". 23 Q. No, that's right 24 Do you know --
- SIR MARTIN MOORE-BICK: Well, it does use the words 25

September 7, 2021

Day 170

1	"suitable and sufficient", doesn't it?	1
2	A. Yes, it does, yes.	2
3	SIR MARTIN MOORE-BICK: It might be an interesting matter	3
4	for debate whether they in turn assume the existence of	4
5	a degree of competence necessary to carry out a suitable	5
6	and sufficient risk assessment.	6
7	A. Yes, and I was very interested in your exchange on that,	7
8	actually. You were talking about cooks and puddings,	8
9	that you can accidentally produce $$ and it's actually	9
10	quite a serious point though, that can an incompetent $$	10
11	or someone with less competence than somebody else	11
12	classified as having extreme competence end up producing	12
13	a suitable and sufficient risk assessment, and the	13
14	answer must be "probably". But I think where competence	14
15	comes in is, as a function of the hazards in the	15
16	building and the type of building you're looking at, the	16
17	less competence there, the less likely it is you will	17
18	find all the relevant hazards, which is the main point	18
19	of carrying out a risk assessment.	19
20	So I think it's about maybe likelihood of missing	20
21	something as opposed to $$ I suppose I can turn the	21
22	argument around: can a very competent person end up	22
23	producing a risk assessment that others will conclude	23
24	was not suitable and sufficient? And the answer is yes.	24
25	SIR MARTIN MOORE-BICK: Can you just help me with this,	25
	29	
	27	
1	since I've interrupted your flow.	1
2	A. Sorry, yes, yes.	2
3	SIR MARTIN MOORE–BICK: It occurs to me that if you're going	3
4	to assess the risks relating to fire, you're going to	4
5	ask yourself: what are the risks of an outbreak of fire?	5
6	A. Yes.	6
7	SIR MARTIN MOORE-BICK: What is the possibility of	7
8	controlling a fire if it does occur?	8
9	A. Yes.	9
10	SIR MARTIN MOORE—BICK: And what are the prospects of	10
11	escaping from a fire if you can't control it?	11

3	SIR MARTIN MOORE—BICK: It occurs to me that if you re going
4	to assess the risks relating to fire , you're going to
5	ask yourself: what are the risks of an outbreak of fire?
6	A. Yes.
7	SIR MARTIN MOORE-BICK: What is the possibility of
8	controlling a fire if it does occur?
9	A. Yes.
10	SIR MARTIN MOORE-BICK: And what are the prospects of
11	escaping from a fire if you can't control it?
12	A. Yes.
13	SIR MARTIN MOORE-BICK: Is there anything else that you're
14	looking at at the overall level?
15	A. Yes, I think there is . So that's the fire scenario
16	side, so what in the building can cause a fire to occur
17	in the first place, where will the fire spread, how does
18	that impact the people, okay? How it impacts the
19	people, and so what type of evacuation may be available
20	to them, is a function of your understanding of what,
21	you know, the Building Regulations, separate
22	legislation , but it calls fire safety provisions . So
23	what's in the building that's meant to make it safe when
24	the fire has broken out and if the fire is spreading?
25	So as well as those fire scenarios, you can't

1	determine that spread and, you know, consequences
2	without understanding what the building itself is
3	capable of in those scenarios.
4	SIR MARTIN MOORE-BICK: Well, that has a bearing on the
5	ability to escape from a fire, I assume?
6	A. Absolutely, yes, it has a bearing on how you escape,
7	you know, and the likelihood of being able to, and it
8	also has an impact on firefighting as well, noting that,
9	yes, I understand that that's separate. But it impacts
10	what's possible in those scenarios.
11	SIR MARTIN MOORE-BICK: Thank you.
12	MR MILLETT: Can we go to {CTA00000011/108}, please. What
13	I'm showing you is the competency criteria published by
14	the Competency Council in, I think, 2011. This is part
15	of Mr Todd's report.
16	If we go to page 109 in that document
17	$\{CTA00000011/109\}$ , this is the foreword. It was
18	published on 21 December 2011.
19	If you go to the second paragraph under the
20	foreword, you can see that it says:
21	"There is no legislative requirement for the fire
22	risk assessment to be carried out by a competent person.
23	This is to avoid an implication that every duty holder
24	under the legislation needs to employ the services of

a fire safety specialist , such as a consultant, to carry

# 

1		out their fire risk assessment."
2		Now, despite the fact that the dutyholder is not
3		obliged, it seems, to retain the services of a competent
4		fire safety specialist , is it the case that every fire
5		risk assessment must be carried out competently?
6	Α.	Yes, it is . Am I allowed to say something about that
7		sentence there, please?
8	Q.	Yes.
9	Α.	Like, I think my experience of working with different
10		organisations is some of the best risk assessments and
11		fire risk management systems come when there's
12		a competent person embedded in the organisation, because
13		there's that bit of what really goes on every day in
14		an organisation and in a building that's really
15		important, okay? So I don't know why it kind of goes
16		from one extreme to another, that there's no competence
17		so you don't need to employ a specialist. I don't
18		understand why it's so linear, that description there.
19	Q.	Right, I see. Because, of course, there is
20		an obligation to have a competent adviser, isn't there?
21	Α.	Yes, there is.
22	Q.	A competent person within the organisation.
23	Α.	Yes, yes.
24	Q.	So you say that there's an inconsistency there, is
25		there, between $$

- 1 A. Well, I don't understand why we go from -- well, I don't 2 understand why you don't need competence to do a fire 3 risk assessment, and you are required to have competence 4 to do any other risk assessment, and I've made it clear that I don't understand that. But I don't understand 5 why that triggers this phrase about needing a specialist 6 7 and having to employ someone from outside. That's all. 8 I don't think it 's a big point. 9 Q. Right, okay. 10 In a high-rise residential building, would it be 11 normal, in your experience, for a fire risk assessor --12 I call them a specialist, someone who does it a lot --13 A. Okay, yes. Q. -- to be instructed, or would it be normal for the 14 15 responsible person to take on that obligation or that function itself? 16 A. Well, I think I've seen both. I mean, sometimes I'm 17 18 brought in, you know, to review what's going on, okay? 19 And I can't speak for the thousands of people carrying 20 out this work. Yes. 21 Q. Right. 2.2 Would you expect anyone undertaking a fire risk 23 assessment, whether it was the responsible person itself 24 or on its behalf, to meet the standards of the 25 reasonably competent fire risk assessor as contained in 33 1 PAS 79 and in these criteria? 2 A. In PAS 79, and which criteria here on this page, sorry? 3 Oh, down at F -- the FRAC, the Fire Risk Assessment 4 Competency Council? 5 Q. Yes, the one that's on the screen. 6 A. I think, you know -- yes, I think that would be a fair 7 and reasonable thing for a responsible person to do. 8 Q. Right. 9 Other than the Fire Risk Assessment Competency 10
- 10Council criteria published in December 2011, and PAS 7911published in August 2012, other than those two
- 12 documents, is there any other guidance document that you 13 would use to determine or enforce competency on the part
- 14 of a fire risk assessor?
- 15
   A. Enforce competency ... I mean, I think they're very well

   16
   established. I mean, I think I'd be -- you know,
- 17 I think there's helpful guidance on competency generally
- 18 from the HSE. I quite like how they describe
- 19 competency.
- 20 Q. Right.
- 21 A. Okay.
- 22 Q. Now, forgive the generality of this question next, but
- 23 in light of some of Mr Todd's evidence, I feel bound to
- 24ask you: do you agree or disagree that PAS 79 applies to25fire risk assessments of high-rise residential buildings
  - 34

- 1 such as Grenfell Tower?
- 2 A. Well, I very much thought it was.
- 3~ Q. Yes. Are you aware of any parts of PAS 79 that were
- 4 intended to apply only to commercial premises?
- 5~ A. I don't know anything about that. I am a practitioner.
- $\boldsymbol{6}$  I read the document, I apply it, I ignore parts where
- 7 it is not relevant to my work. But as far as I'm
- 8 concerned, it's a perfectly appropriate document to use
- 9 any time I'm doing a risk assessment.10 Q Let me try this a different way
- Q. Let me try this a different way.
   During your time as practitioner, up to and including June 2017, or even today for what it's worth,
- 12 including state 2017, of even today for what it is worth, 13 were you or are you aware of any understanding or any
- 14 view in the fire risk assessment business that, when it
- 15 came to high-rise residential buildings, there were some
- 16 parts of PAS 79 that should be treated either as wholly
- 17 inapplicable or applied with less vigour than if the
- 18 building were a commercial building?
- 19 A. I don't know anything about that.
- 20~ Q. When you say you don't know anything about --
- 21  $\,$  A. I've never heard that, but I'm very uncomfortable kind
- 22 of representing people I've never met.
- 23 Q. No, but I'm asking you about what you --
- 24  $\,$  A. No, no, so in my work and in the work of all the people
- 25 at Arup and the other people that we engage with,

1	including work that we have to review, that's not
2	a theme that I've ever had to tackle.
3	Q. Yes, and I think that answers my question, which was:
4	were you aware of any view floating around the business
5	that there were bits of PAS 79 that simply either didn't
6	apply to high—rise residential buildings or you could
7	sort of treat as secondary?
8	A. So I haven't heard that, but maybe someone else would
9	come in here and tell you they heard it every day. But
10	in my working environment, that's not something I've
11	ever been aware of or had to deal with.
12	SIR MARTIN MOORE-BICK: My recollection is that Mr Todd was
13	of the view that PAS 79 had been drafted principally
14	with commercial buildings in mind, and that, in his
15	view, some parts of it were not really very appropriate
16	to residential buildings. Is that something on which
17	you can comment?
18	A. Well, I think I think that if an author of
19	a document thinks that, they should say it at the front.
20	l'm sorry, l feel like l'm being a bit $$ you know,
21	I would like to know that as a user of the document.
22	In terms of exercising my own judgement and
23	independent thought when I've used PAS 79, I've never
24	reached a point where it fell down for me when I was
25	risk assessing anything. I find it a very good method

September 7, 2021

1		to assist me in my work.	
	-		
2	IVIT	R MILLETT: And following on from that, can I just show you	
3		what you say in chapter 8 of your report.	
4	Α.	Yes.	
5	Q.	Can we go to {BLARP20000027/60}, paragraph 5.5.12.	
6		You say there:	
7		"In my opinion PAS 79:2012 provides the most	
8		comprehensive guidance on action plans therefore I have	
9		used this document as the benchmark for my later	
10		assessments."	
11	Α.	Yes.	
12	Q.	One or two questions flowing on from that.	
13		Do you agree that a fire risk assessor could use the	
14		template in either annex B or annex E to PAS 79,	
15		depending on whether they were carrying out a new FRA or	
16		an FRA review?	
17	Α.	Yes, they could.	
18	Q.	Yes, and if the format varied, they would need to make	
19		sure $$ is this right, do you agree $$ that all the	
20		recommendations of the current PAS 79 were satisfied?	
21	Α.	Yes, because most people $\ensuremath{\mathrm{I}}$ mean, I went back and had	
22		a look at things, coming here. Most people actually	
23		adapt it to make it premises—specific.	
24	Q.	Right.	
25		Following on from that, given that a fire risk	

37

1		assessor isn't required to use any particular template
2		but makes it premises-specific, would you expect that
3		for FRAs on Grenfell done after August 2012, the
4		reasonable fire risk assessor would have used the
5		2012 version of PAS 79?
6	Α.	Yes.
7	Q.	Yes.
8	Α.	Yes.
9	Q.	Is it fair to say that if he or she did not use the
10		2012 version of PAS 79 but an earlier version, there
11		would be a risk that the fire risk assessor would not
12		necessarily be following the most $up-to-date$
13		British Standards or industry guidance?
14	Α.	They're not enormously different. I can provide
15		a comparison. But I think it's a sign of keeping up to
16		date on things, which is a very important part of
17		actually demonstrating competence to other people, even
18		if not to yourself, that you are aware that such
19		a significant document has been subject to a revision.
20	Q.	Yes, thank you.
21		Now, I want to ask you some questions about other
22		guidance documents published relevant to the conduct of
23		fire risk assessments which you've referred to in your
24		report at chapter 8 at section 5.

25 Would you expect Mr Stokes, as the fire risk

38

- 1 assessor on behalf of the TMO for Grenfell Tower in the
- 2 years 2010 to 2016, to have a reasonably thorough
- 3 knowledge of -- and I'm going to give you a list --
- 4 first , what we call the Sleeping Guide, namely
- HM Government "Fire safety risk assessment: sleeping 5
- accommodation", published in 2006 --6
- 7 A. Yes.
- 8 Q. -- at {RBK00036722}? Yes?
- 9 A. Yes.
- 10 Q. Yes, you would.
- 11 The second document, would you expect Mr Stokes to 12 have a reasonably thorough knowledge of the
- 13 HM Government guide entitled, "Fire safety risk
- 14 assessment: means of escape for disabled people"
- 15 published in March 2007?
- A Yes 16
- 17 Q. {INQ00014732}. You would.
- Third document, the LACORS "Housing fire safety -18
- 19 guidance on fire safety provisions for certain types of
- 20 existing housing" published in 2008?
- 21 A. Yes.
- 22 Q. Yes, {CST00002516}.
- 23 Next document, the LGA "Fire safety in purpose-built
- 24 blocks of flats", first printed in July 2011 and then 25
  - reprinted without the error a little bit later that

39

1		year?
2	Α.	Yes.
3	Q.	{HOM00045964}.
4		Finally, would you expect the reasonably competent
5		fire risk assessor during that period for Grenfell Tower
6		to be familiar or reasonably familiar with the relevant
7		British Standards, so for example British Standard
8		9991:2015?
9	Α.	Yes, and probably more so the British Standards for the
10		systems in the building.
11	Q.	So including lifts , for example?
12	Α.	Yes, all the different types of systems and all the
13		guidance documents refer you to those other standards.
14	Q.	Yes, I see. Thank you.
15		Now, can we just look, then, at the LGA guide, and
16		${\sf I}$ want to ask you about where it sits in the pantheon,
17		if you like, of guidance.
18		Can we go, please, to your chapter 11,
19		{BLARP20000040/7}. Here, at paragraph 3.1.5, you say:
20		"At Section 5.1 of the LGA Guide it states that,
21		with respect to $purpose-built \ blocks \ of \ flats$ , it
22		'builds on the advice given' in the HM 'Sleeping
23		accommodation' guide, but it also states (two paragraphs
24		later) at Section 5.3 that the LGA Guide is 'the more
25		appropriate guide to use for purpose-built blocks of

1	flats .'"	
2	If you go on the same page to paragraph $3.1.7$ , two	
3	paragraphs down, you say:	
4	"I have found no other publicly available evidence	
5	that Fire safety risk assessment $-$ sleeping	
6	accommodation was superseded by the LGA Guide (which i	s
7	not a HM Government publication) and therefore that the	
8	HM Government guides no longer applied to purpose built	
9	blocks of flats , with respect to article 50."	
10	Then if you go back to chapter 1 at	
11	{BLARP20000023/68}, paragraph 5.1.24, you say:	
12	"And I consider it reasonable to expect responsible	
13	persons and their safety assistants to have considered	
14	HM 'Sleeping accommodation' guide fully, not just the	
15	LGA Guide in isolation, nor as a primary reference	
16	source."	
17	Now, I've shown you what you've said in your report	
18	there in those places. Having heard the evidence in	
19	this part of the Inquiry thus far, do you maintain the	
20	opinions that you have set out in those parts I've just	
21	shown you?	
22	A. Yes, I do.	
23	Q. You do.	
24	Now, let's go, then, to the LGA guide at	
25	{HOM00045964/14}.	

1	There is a heading next to section 5, "Relationship
2	to other guidance", and it says in the second line:
3	"It builds on the advice given in the DCLG Sleeping
4	accommodation guide mentioned earlier."
5	That's what you have quoted. It goes on to say:
6	"That guide applies generically to all premises in
7	which people sleep, but, for purpose-built blocks of
8	flats , this guide is likely to be the more appropriate
9	one to use."
10	If you go to paragraph 5.3, two paragraphs down, it
11	says:
12	"This present guide covers all purpose-built blocks
13	of flats (both common parts and the flats themselves),
14	including those within the scope of the DCLG and LACoRS
15	guides. It is, therefore, the more appropriate guide to
16	use for purpose-built blocks of flats."
17	In light of those express statements in the
18	LGA guide, can you help us understand why it wasn't
19	reasonable for any fire risk assessor conducting an FRA
20	in the period 2012 to 2016, after the publication of the
21	LGA guide, on a block of flats in general needs housing,
22	to have regard only to the LGA guide on the basis that
23	it absorbed everything of relevance in the DCLG and
24	LACORS guides? Why was it unreasonable for a fire risk
25	assessor only to use this document?

42

1	Α.	Okay. Well, if we're talking about Grenfell Tower, all
2		the guidance documents were referred to, so it's not
3		relevant. If you're asking me to give a view on lots of
4		other people and what they did, which I've told you I'm
5		not comfortable doing, again I've gone back and looked
6		at all different documents that are available to me, and
7		what I see is most people list out all those guidance
8		documents and then state they've had to exercise
9		judgement. That is my experience.
10	Q.	Right.
11	Α.	And I understand the language written here, okay? But
12		it does not say to me that I must ignore everything
13		else .
14	Q.	Let me try
15	Α.	Yes.
16	Q.	Thank you, and I understand that. Let me see if I can
17		get an expansion on that a little bit.
18	Α.	Yes.
19	Q.	If a fire risk assessor, assessing a building such as
20		Grenfell Tower in the period 2012 to 2016 $$
21	Α.	Yes.
22	Q.	used this guide, the LGA guide, only and didn't use
23		or look at the other guidance, such as the
24		Sleeping Guide

25 A. Yes.

# 43

1	Q.	would he or she be falling below the standards of the
2		reasonably competent fire risk assessor?
3	Α.	So that didn't happen at Grenfell, okay? If a person
4		read the LGA guide only, it still refers them out to all
5		the different British Standards and all the different
6		things. You can never, in my opinion, simply read the
7		LGA and carry out your work.
8	Q.	So I think the answer to my question is that if you did
9		only read the LGA and carry out your work, you would be
10		falling below the standards of reasonable competence
11		expected of a fire risk assessor?
12	Α.	I think I'm being asked to give a view on a published
13		guidance document as if that's what the focus of my work
14		was. The focus of my work was on Grenfell Tower.
15		I think the LGA guide document is a summary of lots
16		of different publications, with other opinions there,
17		and, in my professional opinion, it requires a careful
18		reading and a careful assessment with other published
19		guidance documents.
20	Q.	Would you criticise a responsible person or a fire risk
21		assessor for using the LGA guide as essentially what
22		I might call a one-stop shop and nothing else?
23	Α.	If the resulting risk assessment contained items that
24		I considered to pose a risk to life , or I considered to

25 be, from a technical perspective, not in compliance with

1		the order, yes, I would.	1		building regs $$
2	Q.	Thank you. Thank you.	2	Α.	Yes.
3		Now, turning to a totally different topic $$ well,	3	Q.	just as internal compartmentation.
4		not totally different , relatively different $$ the scope	4	Α.	Yes.
5		of an FRA and practical steps, including	5	Q.	Can you just explain what it is about the
6		evidence-gathering and frequency. That's what we're	6		Building Regulations that makes an external wall
7		going to look at next, Dr Lane.	7		a protection measure?
8		First , can I show you $$ and I'm not going to read	8	Α.	No, so I wasn't trying to imply some kind of $\dots$ that's
9		it all out $$ chapter 11 of your report at	9		a different way of saying it . So what I was trying to
10		$\{BLARP20000040/5\}$ . I'd like just to show you what's on	10		say is, I said a while ago, as a fire risk assessor, you
11		that page under the heading "The [RRO]".	11		have to understand what's in the building and then what
12		At paragraph 2.1.4, four paragraphs down, you say:	12		happens when the fire starts, and I wanted to make the
13		"One central question which emerges is whether the	13		point that the external wall is one of the fire safety
14		external wall is within the scope of the duties set out	14		provisions that comes with, you know, a high-rise
15		in the RR(FS)O."	15		residential building. So it has to perform to a certain
16	Α.	Yes.	16		standard.
17	Q.	You proceed after that to set out, down to	17	Q.	Now
18		subparagraph 14 on the next page $\{\text{BLARP20000040}/6\},$ if	18	Α.	Okay?
19		we can just turn the page, your opinion there that the	19	Q.	Yes.
20		external wall of a building with a stay-put policy or	20	Α.	When you get under the order $$ so I don't want everyone
21		stay-put strategy falls within the scope of the RRO.	21		saying, "Oh, she said the building regs equal this",
22		Now, I'll show you what you do say expressly at	22		that's not what I mean. When you get to the order and
23		paragraph 2.1.14. You say:	23		you're doing your risk assessment, you should be able to
24		"From that perspective, the KCTMO, should not have	24		rely on that external wall to perform as intended, when
25		omitted the external wall construction from its	25		considering, you know, how the compartmentation $$ where
		45			47
		45			47
1		\$45 assessment of risk , as it was so interlinked with the	1		47 it abuts that wall, how reliable it is, when you're
1 2			1 2		
		assessment of risk, as it was so interlinked with the			it abuts that wall, how reliable it is, when you're
2		assessment of risk, as it was so interlinked with the safety of relevant persons in Grenfell Tower and because	2		it abuts that wall, how reliable it is, when you're going to continue to rely on also the stay-put strategy.
2 3		assessment of risk, as it was so interlinked with the safety of relevant persons in Grenfell Tower and because Grenfell Tower relied on the Stay Put strategy."	2 3		it abuts that wall, how reliable it is, when you're going to continue to rely on also the stay—put strategy. Okay?
2 3 4		assessment of risk, as it was so interlinked with the safety of relevant persons in Grenfell Tower and because Grenfell Tower relied on the Stay Put strategy." In understanding your evidence, do I summarise it	2 3 4		it abuts that wall, how reliable it is, when you're going to continue to rely on also the stay—put strategy. Okay? And it's a collective protective measure, because
2 3 4 5		assessment of risk, as it was so interlinked with the safety of relevant persons in Grenfell Tower and because Grenfell Tower relied on the Stay Put strategy." In understanding your evidence, do I summarise it correctly by asking you that the gist of that evidence	2 3 4 5		it abuts that wall, how reliable it is, when you're going to continue to rely on also the stay—put strategy. Okay? And it's a collective protective measure, because the whole purpose of stay put is that once the people
2 3 4 5 6		assessment of risk, as it was so interlinked with the safety of relevant persons in Grenfell Tower and because Grenfell Tower relied on the Stay Put strategy." In understanding your evidence, do I summarise it correctly by asking you that the gist of that evidence or your opinion is that the external wall constitutes	2 3 4 5 6		it abuts that wall, how reliable it is, when you're going to continue to rely on also the stay—put strategy. Okay? And it's a collective protective measure, because the whole purpose of stay put is that once the people who have to leave —— and there's always a cohort of
2 3 4 5 6 7	A.	assessment of risk, as it was so interlinked with the safety of relevant persons in Grenfell Tower and because Grenfell Tower relied on the Stay Put strategy." In understanding your evidence, do I summarise it correctly by asking you that the gist of that evidence or your opinion is that the external wall constitutes a collective protective measure for relevant persons in	2 3 4 5 6 7		it abuts that wall, how reliable it is, when you're going to continue to rely on also the stay—put strategy. Okay? And it's a collective protective measure, because the whole purpose of stay put is that once the people who have to leave —— and there's always a cohort of people that have to leave —— it should be safe for
2 3 4 5 6 7 8	A.	assessment of risk, as it was so interlinked with the safety of relevant persons in Grenfell Tower and because Grenfell Tower relied on the Stay Put strategy." In understanding your evidence, do I summarise it correctly by asking you that the gist of that evidence or your opinion is that the external wall constitutes a collective protective measure for relevant persons in any building with a stay-put strategy?	2 3 4 5 6 7 8		it abuts that wall, how reliable it is, when you're going to continue to rely on also the stay—put strategy. Okay? And it's a collective protective measure, because the whole purpose of stay put is that once the people who have to leave —— and there's always a cohort of people that have to leave —— it should be safe for everyone else to stay, and that means the
2 3 4 5 6 7 8 9		assessment of risk, as it was so interlinked with the safety of relevant persons in Grenfell Tower and because Grenfell Tower relied on the Stay Put strategy." In understanding your evidence, do I summarise it correctly by asking you that the gist of that evidence or your opinion is that the external wall constitutes a collective protective measure for relevant persons in any building with a stay—put strategy? Yes. So any building where the compartmentation abuts	2 3 4 5 6 7 8 9		it abuts that wall, how reliable it is, when you're going to continue to rely on also the stay—put strategy. Okay? And it's a collective protective measure, because the whole purpose of stay put is that once the people who have to leave —— and there's always a cohort of people that have to leave —— it should be safe for everyone else to stay, and that means the compartmentation they rely on, and I'll just keep using
2 3 4 5 6 7 8 9 10	Q.	assessment of risk, as it was so interlinked with the safety of relevant persons in Grenfell Tower and because Grenfell Tower relied on the Stay Put strategy." In understanding your evidence, do I summarise it correctly by asking you that the gist of that evidence or your opinion is that the external wall constitutes a collective protective measure for relevant persons in any building with a stay-put strategy? Yes. So any building where the compartmentation abuts the external wall	2 3 4 5 7 8 9 10	Q.	it abuts that wall, how reliable it is, when you're going to continue to rely on also the stay-put strategy. Okay? And it's a collective protective measure, because the whole purpose of stay put is that once the people who have to leave — and there's always a cohort of people that have to leave — it should be safe for everyone else to stay, and that means the compartmentation they rely on, and I'll just keep using this phrase, where it abuts the external wall, it
2 3 4 5 6 7 8 9 10 11	Q.	assessment of risk, as it was so interlinked with the safety of relevant persons in Grenfell Tower and because Grenfell Tower relied on the Stay Put strategy." In understanding your evidence, do I summarise it correctly by asking you that the gist of that evidence or your opinion is that the external wall constitutes a collective protective measure for relevant persons in any building with a stay-put strategy? Yes. So any building where the compartmentation abuts the external wall — Yes.	2 3 4 5 6 7 8 9 10 11	Q.	it abuts that wall, how reliable it is, when you're going to continue to rely on also the stay-put strategy. Okay? And it's a collective protective measure, because the whole purpose of stay put is that once the people who have to leave —— and there's always a cohort of people that have to leave —— it should be safe for everyone else to stay, and that means the compartmentation they rely on, and I'll just keep using this phrase, where it abuts the external wall, it becomes reliant on that performing. Okay?
2 3 4 5 6 7 8 9 10 11 12	Q.	assessment of risk, as it was so interlinked with the safety of relevant persons in Grenfell Tower and because Grenfell Tower relied on the Stay Put strategy." In understanding your evidence, do I summarise it correctly by asking you that the gist of that evidence or your opinion is that the external wall constitutes a collective protective measure for relevant persons in any building with a stay-put strategy? Yes. So any building where the compartmentation abuts the external wall — Yes. — it means the external wall is — so when the internal	2 3 4 5 6 7 8 9 10 11 12		it abuts that wall, how reliable it is, when you're going to continue to rely on also the stay-put strategy. Okay? And it's a collective protective measure, because the whole purpose of stay put is that once the people who have to leave — and there's always a cohort of people that have to leave — it should be safe for everyone else to stay, and that means the compartmentation they rely on, and I'll just keep using this phrase, where it abuts the external wall, it becomes reliant on that performing. Okay? Now, just to be absolutely precise, when you say the
2 3 4 5 6 7 8 9 10 11 12 13	Q.	assessment of risk, as it was so interlinked with the safety of relevant persons in Grenfell Tower and because Grenfell Tower relied on the Stay Put strategy." In understanding your evidence, do I summarise it correctly by asking you that the gist of that evidence or your opinion is that the external wall constitutes a collective protective measure for relevant persons in any building with a stay-put strategy? Yes. So any building where the compartmentation abuts the external wall Yes. it means the external wall is so when the internal compartmentation abuts the external wall as you know,	2 3 4 5 6 7 8 9 10 11 12 13	A.	it abuts that wall, how reliable it is, when you're going to continue to rely on also the stay-put strategy. Okay? And it's a collective protective measure, because the whole purpose of stay put is that once the people who have to leave —— and there's always a cohort of people that have to leave —— it should be safe for everyone else to stay, and that means the compartmentation they rely on, and I'll just keep using this phrase, where it abuts the external wall, it becomes reliant on that performing. Okay? Now, just to be absolutely precise, when you say the external wall is a fire safety provision ——
2 3 4 5 6 7 8 9 10 11 12 13 14	Q.	assessment of risk, as it was so interlinked with the safety of relevant persons in Grenfell Tower and because Grenfell Tower relied on the Stay Put strategy." In understanding your evidence, do I summarise it correctly by asking you that the gist of that evidence or your opinion is that the external wall constitutes a collective protective measure for relevant persons in any building with a stay-put strategy? Yes. So any building where the compartmentation abuts the external wall — Yes. — it means the external wall is — so when the internal compartmentation abuts the external wall — as you know, the external wall in high-rise buildings is	2 3 4 5 6 7 8 9 10 11 12 13 14	A.	it abuts that wall, how reliable it is, when you're going to continue to rely on also the stay—put strategy. Okay? And it's a collective protective measure, because the whole purpose of stay put is that once the people who have to leave —— and there's always a cohort of people that have to leave —— it should be safe for everyone else to stay, and that means the compartmentation they rely on, and I'll just keep using this phrase, where it abuts the external wall, it becomes reliant on that performing. Okay? Now, just to be absolutely precise, when you say the external wall is a fire safety provision —— Yes.
2 3 4 5 6 7 8 9 10 11 12 13 14 15	Q.	assessment of risk, as it was so interlinked with the safety of relevant persons in Grenfell Tower and because Grenfell Tower relied on the Stay Put strategy." In understanding your evidence, do I summarise it correctly by asking you that the gist of that evidence or your opinion is that the external wall constitutes a collective protective measure for relevant persons in any building with a stay-put strategy? Yes. So any building where the compartmentation abuts the external wall Yes. it means the external wall is so when the internal compartmentation abuts the external wall as you know, the external wall in high-rise buildings is a fire safety provision and has a section in the	2 3 4 5 6 7 8 9 10 11 12 13 14	A.	it abuts that wall, how reliable it is, when you're going to continue to rely on also the stay—put strategy. Okay? And it's a collective protective measure, because the whole purpose of stay put is that once the people who have to leave — — and there's always a cohort of people that have to leave — — it should be safe for everyone else to stay, and that means the compartmentation they rely on, and I'll just keep using this phrase, where it abuts the external wall, it becomes reliant on that performing. Okay? Now, just to be absolutely precise, when you say the external wall is a fire safety provision — Yes. —— do you mean that it has fire safety rules about it,
2 3 4 5 6 7 8 9 10 11 12 13 14 15 16	Q.	assessment of risk, as it was so interlinked with the safety of relevant persons in Grenfell Tower and because Grenfell Tower relied on the Stay Put strategy." In understanding your evidence, do I summarise it correctly by asking you that the gist of that evidence or your opinion is that the external wall constitutes a collective protective measure for relevant persons in any building with a stay-put strategy? Yes. So any building where the compartmentation abuts the external wall Yes. it means the external wall is so when the internal compartmentation abuts the external wall as you know, the external wall in high-rise buildings is a fire safety provision and has a section in the building regs, just as internal compartmentation has	2 3 4 5 6 7 8 9 10 11 12 13 14 15 16	A. Q.	it abuts that wall, how reliable it is, when you're going to continue to rely on also the stay—put strategy. Okay? And it's a collective protective measure, because the whole purpose of stay put is that once the people who have to leave — — and there's always a cohort of people that have to leave — — it should be safe for everyone else to stay, and that means the compartmentation they rely on, and I'll just keep using this phrase, where it abuts the external wall, it becomes reliant on that performing. Okay? Now, just to be absolutely precise, when you say the external wall is a fire safety provision — Yes. — — do you mean that it has fire safety rules about it, including B4, the functional requirement in B4, and
2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17	Q.	assessment of risk, as it was so interlinked with the safety of relevant persons in Grenfell Tower and because Grenfell Tower relied on the Stay Put strategy." In understanding your evidence, do I summarise it correctly by asking you that the gist of that evidence or your opinion is that the external wall constitutes a collective protective measure for relevant persons in any building with a stay-put strategy? Yes. So any building where the compartmentation abuts the external wall — Yes. —— it means the external wall is —— so when the internal compartmentation abuts the external wall —— as you know, the external wall in high—rise buildings is a fire safety provision and has a section in the building regs, just as internal compartmentation has a section in the building regs, and so where you rely on	2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17	A. Q.	it abuts that wall, how reliable it is, when you're going to continue to rely on also the stay—put strategy. Okay? And it's a collective protective measure, because the whole purpose of stay put is that once the people who have to leave — — and there's always a cohort of people that have to leave — — it should be safe for everyone else to stay, and that means the compartmentation they rely on, and I'll just keep using this phrase, where it abuts the external wall, it becomes reliant on that performing. Okay? Now, just to be absolutely precise, when you say the external wall is a fire safety provision — Yes. — — do you mean that it has fire safety rules about it, including B4, the functional requirement in B4, and section 12 of ADB?
2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18	Q.	assessment of risk, as it was so interlinked with the safety of relevant persons in Grenfell Tower and because Grenfell Tower relied on the Stay Put strategy." In understanding your evidence, do I summarise it correctly by asking you that the gist of that evidence or your opinion is that the external wall constitutes a collective protective measure for relevant persons in any building with a stay-put strategy? Yes. So any building where the compartmentation abuts the external wall — Yes. —— it means the external wall is —— so when the internal compartmentation abuts the external wall —— as you know, the external wall in high—rise buildings is a fire safety provision and has a section in the building regs, just as internal compartmentation has a section in the building regs, and so where you rely on the protection afforded by the internal walls and the	2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18	A. Q.	it abuts that wall, how reliable it is, when you're going to continue to rely on also the stay—put strategy. Okay? And it's a collective protective measure, because the whole purpose of stay put is that once the people who have to leave — and there's always a cohort of people that have to leave — it should be safe for everyone else to stay, and that means the compartmentation they rely on, and I'll just keep using this phrase, where it abuts the external wall, it becomes reliant on that performing. Okay? Now, just to be absolutely precise, when you say the external wall is a fire safety provision — Yes. — do you mean that it has fire safety rules about it, including B4, the functional requirement in B4, and section 12 of ADB? Yes. There's a it's a fire safety provision, and
2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19	Q. A.	assessment of risk, as it was so interlinked with the safety of relevant persons in Grenfell Tower and because Grenfell Tower relied on the Stay Put strategy." In understanding your evidence, do I summarise it correctly by asking you that the gist of that evidence or your opinion is that the external wall constitutes a collective protective measure for relevant persons in any building with a stay—put strategy? Yes. So any building where the compartmentation abuts the external wall — Yes. —— it means the external wall is —— so when the internal compartmentation abuts the external wall —— as you know, the external wall in high—rise buildings is a fire safety provision and has a section in the building regs, just as internal compartmentation has a section in the building regs, and so where you rely on the protection afforded by the internal walls and the external wall for your evacuation, it is a collective	2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19	A. Q.	it abuts that wall, how reliable it is, when you're going to continue to rely on also the stay—put strategy. Okay? And it's a collective protective measure, because the whole purpose of stay put is that once the people who have to leave — and there's always a cohort of people that have to leave — it should be safe for everyone else to stay, and that means the compartmentation they rely on, and I'll just keep using this phrase, where it abuts the external wall, it becomes reliant on that performing. Okay? Now, just to be absolutely precise, when you say the external wall is a fire safety provision — Yes. — do you mean that it has fire safety rules about it, including B4, the functional requirement in B4, and section 12 of ADB? Yes. There's a it's a fire safety provision, and the rules are correct as you've described them, okay?
2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20	Q. A.	assessment of risk, as it was so interlinked with the safety of relevant persons in Grenfell Tower and because Grenfell Tower relied on the Stay Put strategy." In understanding your evidence, do I summarise it correctly by asking you that the gist of that evidence or your opinion is that the external wall constitutes a collective protective measure for relevant persons in any building with a stay—put strategy? Yes. So any building where the compartmentation abuts the external wall — Yes. —— it means the external wall is —— so when the internal compartmentation abuts the external wall —— as you know, the external wall in high—rise buildings is a fire safety provision and has a section in the building regs, just as internal compartmentation has a section in the building regs, and so where you rely on the protection afforded by the internal walls and the external wall for your evacuation, it is a collective protective measure.	2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20	A. Q.	it abuts that wall, how reliable it is, when you're going to continue to rely on also the stay—put strategy. Okay? And it's a collective protective measure, because the whole purpose of stay put is that once the people who have to leave —— and there's always a cohort of people that have to leave —— it should be safe for everyone else to stay, and that means the compartmentation they rely on, and I'll just keep using this phrase, where it abuts the external wall, it becomes reliant on that performing. Okay? Now, just to be absolutely precise, when you say the external wall is a fire safety provision —— Yes. —— do you mean that it has fire safety rules about it, including B4, the functional requirement in B4, and section 12 of ADB? Yes. There's a it's a fire safety provision, and the rules are correct as you've described them, okay? And it's part of the package. So when you design
2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21	Q. A.	assessment of risk, as it was so interlinked with the safety of relevant persons in Grenfell Tower and because Grenfell Tower relied on the Stay Put strategy." In understanding your evidence, do I summarise it correctly by asking you that the gist of that evidence or your opinion is that the external wall constitutes a collective protective measure for relevant persons in any building with a stay-put strategy? Yes. So any building where the compartmentation abuts the external wall — Yes. — it means the external wall is — so when the internal compartmentation abuts the external wall — as you know, the external wall in high-rise buildings is a fire safety provision and has a section in the building regs, just as internal compartmentation has a section in the building regs, and so where you rely on the protection afforded by the internal walls and the external wall for your evacuation, it is a collective protective measure. Can I just understand that a little bit more closely, on	2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21	A. Q.	it abuts that wall, how reliable it is, when you're going to continue to rely on also the stay—put strategy. Okay? And it's a collective protective measure, because the whole purpose of stay put is that once the people who have to leave — and there's always a cohort of people that have to leave — it should be safe for everyone else to stay, and that means the compartmentation they rely on, and I'll just keep using this phrase, where it abuts the external wall, it becomes reliant on that performing. Okay? Now, just to be absolutely precise, when you say the external wall is a fire safety provision — Yes. — do you mean that it has fire safety rules about it, including B4, the functional requirement in B4, and section 12 of ADB? Yes. There's a it's a fire safety provision, and the rules are correct as you've described them, okay? And it's part of the package. So when you design a high—rise residential building, no matter what decade,
2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22	Q. A. Q. A.	assessment of risk, as it was so interlinked with the safety of relevant persons in Grenfell Tower and because Grenfell Tower relied on the Stay Put strategy." In understanding your evidence, do I summarise it correctly by asking you that the gist of that evidence or your opinion is that the external wall constitutes a collective protective measure for relevant persons in any building with a stay-put strategy? Yes. So any building where the compartmentation abuts the external wall — Yes. — it means the external wall is — so when the internal compartmentation abuts the external wall — as you know, the external wall in high-rise buildings is a fire safety provision and has a section in the building regs, just as internal compartmentation has a section in the building regs, and so where you rely on the protection afforded by the internal walls and the external wall for your evacuation, it is a collective protective measure. Can I just understand that a little bit more closely, on your last answer.	2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22	A. Q.	it abuts that wall, how reliable it is, when you're going to continue to rely on also the stay—put strategy. Okay? And it's a collective protective measure, because the whole purpose of stay put is that once the people who have to leave —— and there's always a cohort of people that have to leave —— it should be safe for everyone else to stay, and that means the compartmentation they rely on, and I'll just keep using this phrase, where it abuts the external wall, it becomes reliant on that performing. Okay? Now, just to be absolutely precise, when you say the external wall is a fire safety provision —— Yes. —— do you mean that it has fire safety rules about it, including B4, the functional requirement in B4, and section 12 of ADB? Yes. There's a it's a fire safety provision, and the rules are correct as you've described them, okay? And it's part of the package. So when you design a high—rise residential building, no matter what decade, the external wall has always been, you know, assigned

46

48

- 1 always really good at explaining about the
- 2 interconnectedness of things, okay? And the external
- 3 wall has always in high-rise buildings and high-rise
- residential buildings, you know, been a fire safety 4
- 5 provision and something that's relied upon in high-rise residential buildings. 6
- 7 Q. I see. So just to clarify -- it may just be me -- can we agree this: the external wall is not itself 8
- 9 a component part of the compartment, but itself has
- 10 regulations applying to it?
- 11 A. Yes, I see what you mean, sorry. So that's true, okay?
- 12 That's correct, and -- because remember, it depends on
- 13 the layout of the space. So at Grenfell, all the flats
- 14 were on the perimeter. There will be other premises
- 15 where you have landlocked compartments that don't abut
- 16 the external wall, okay? So when the internal
- 17 compartmentation, you know, hits the external wall
- 18 together in those circumstances, you are reliant on the
- 19 performance of the wall as well in that capacity.
- 20 Q. So perhaps we can summarise your opinion like this: the
- 21 fire safety and the risks attendant on it of the
- 22 external wall is relevant to the fire risk assessor
- 23 because it is relevant to the maintenance of
- 24 compartmentation?
- 25 A. Exactly, because without it, the internal

- 1 compartmentation can't carry on. So I'm not saying
- 2 an external wall is a compartment wall, because that has
- 3 a really formal definition .
- 4 Q. Yes
- A. But when the internal compartmentation meets the 5
- external wall and the six-sided box -- I've been kind of 6
- 7 going on about this since the very start -- where they
- 8 meet together, one is reliant on the performance of that
- 9 wall in maintaining this overall compartmentation
- 10 strategy to allow people to stay in their flats and not 11 be forced to evacuate.
- 12 Q. Yes
- 13
- A. Okay? Probably I'm not being clear now, but ...
- Q. No, that's very clear. 14
- A. Yes 15
- 16 Q. So does it follow from that that it was your view and is
- your view that the external wall falls within the scope 17
- 18 of the obligations imposed on the responsible person by
- 19 the RRO when it comes to the fire risk assessment?
- 20 A. Yes. So the internal walls and the external wall, where 21 they're relied upon for protection, by definition, in my
- 2.2 mind, that requires consideration in a fire risk
- 23 assessment

Opus 2

Official Court Reporters

- 24 Q. Now, you may have heard --
- 25 SIR MARTIN MOORE-BICK: Can you help me with this, because
  - 50

- 1 I think I'm having a little difficulty . I'm just
- 2 thinking of the external walls at Grenfell Tower before
- 3 the refurbishment.
- 4 A Yes
- SIR MARTIN MOORE-BICK: You had concrete spandrels which 5
- were, by definition, not combustible. 6
- 7 A. Yes
- 8 SIR MARTIN MOORE-BICK: And between them you had window
- 9 spandrels or window pieces --
- 10 A Yes
- SIR MARTIN MOORE-BICK: -- which were not fireproof, and 11
- 12 were either composed of glass fittings or infill panels. 13
  - which may or may not have been very substantial.
- 14 A. Yes
- 15 SIR MARTIN MOORE-BICK: Now, in the case of a fire within
- 16 a flat ---
- 17 A. Yes
- 18 SIR MARTIN MOORE-BICK: -- depending on its severity, that
- part of the external wall would be likely to fail very 19
- 20 quickly
- 21 A. Yes
- SIR MARTIN MOORE-BICK: So --22
- 23 A. Potentially. I'm just struggling to remember what the
- 24 infill panels were made from originally. I thought it
- 25 was some kind of asbestos-type material. But anyway,

## 51

- 1 I can't remember right now. Yes, anyway --
- 2 SIR MARTIN MOORE-BICK: I'm not guite sure, but I don't
- 3 think the window sections were regarded as, as you say,
- 4 part of a compartmentation or as a non-combustible ---
- 5 A. Well, it's the glass --
- 6 SIR MARTIN MOORE-BICK: Exactly, the glass --
- 7 A. Well, you know, it's the glass part, and it breaks
- 8 quickly, absolutely.
- 9 SIR MARTIN MOORE-BICK: The glass will go very quickly.
- 10 A. Yes
- SIR MARTIN MOORE-BICK: So you haven't got any form of real 11
- 12 fire protection on the outside wall, have you?
- 13 A. Yes. Correct. so it's not a compartment wall, which
- would require fire rated glazing. 14
- 15 SIR MARTIN MOORE-BICK: Right.
- 16 A. Okay? But what it's meant to do is to not, you know,
- 17 promote substantial spread of flame beyond that flat.
- 18 So I'm not saying that there will not be a fire breaking
- 19 out of the first flat, okay? But the idea is that it
- 2.0 doesn't promote fire spread to multiple other
- 21 compartments, okav?

might promote fire?

2.4

25

2.2 SIR MARTIN MOORE-BICK: Right. So would it be fair to say 23 that, in your view, the fire risk assessor should be

interested in the external wall to the extent that it

52

transcripts@opus2.com +44 (0)20 3008 5900

- 1 A. Yes, exactly, that it's become a hazard. So you've
- 2 actually touched on something really important. So when
- 3 stay put was created, the rules for the materials in the
- 4 external wall were totally different, okay? So you
- 5 might say, in a way, you didn't need to think about it. You might call that not suitable and sufficient, but if 6
- 7 you didn't think about it, you were more likely --
- you know, it was probably more likely to be okay because 8
- 9 the wall was not a hazard.
- 10 So in my mind, and I've been very -- as clear as 11 I possibly can in my report, I understand everything
- 12 that's written down. I know what I did and I know what
- 13 was happening, but when you think about the wall in
- 14 a building with a stay-put strategy, or other buildings
- 15 with very complex evacuation strategies, you need to
- 16 know if the wall is a protective measure in some form,
- 17 or if in itself it's become a hazard in the event of
- 18 a fire

- 19 SIR MARTIN MOORE-BICK: That I do understand.
- 20 A. Yes, sorry, okay
- 21 SIR MARTIN MOORE-BICK: Thank you very much.
- 2.2 MR MILLETT: The view that you have just expressed in answer
- 23 to the Chairman's question just now, namely that -- and
- 24 I hope I've summarised it correctly as follows -- the
  - fire risk assessor should be interested in the external

# 53

1		wall at least to the extent that it might promote fire,
2		was that an approach or view that you heard in the
3		industry generally from your work? In other words, was
4		that a commonly shared view to the best of your
5		knowledge and experience?
6	Α.	So I just $$ all I can say to you is that my experience
7		is from 2013, I was being asked by people with existing
8		buildings and experiencing difficulties on my own
9		projects with the hazard the external wall posed, and
10		that's all I can say.
11	Q.	Now, let's look, then, at that opinion against the
12		question of what I'm going to loosely call common parts.
13		Can we go to $\{BLARP20000023/5\}$ , and this is
14		chapter 1 of your report. Let's look at
15		paragraph $1.1.11$ towards the middle of the page, a third
16		of the way down your screen, and you say this:
17		"The RR(FS)O expressly excludes premises defined as
18		domestic premises (such as flats). Common practice
19		became therefore to consider areas 'outside' the
20		domestic premises, as so called 'common parts'. I deal
21		with this later in Section 6.2."
22		If we look at section 6 of chapter $1 \$ can we go to
23		page 76, please, of this same document
24		$\{B ARP20000023/76\}$ — you say there at paragraph 6.1.5.

- $\{BLARP20000023/76\}$  you say there at paragraph 6.1.5: 24 25
  - "I am aware for example there is a body of opinion 54

- 1 that because external walls are not 'within the common
- 2 parts', nor part of a workplace, by these definitions
- 3 the external wall falls outside the scope of the
- 4 RR(FS)O. I do not agree."
- Are you referring here, when you say there is a body 5
- 6 of opinion, to a body of opinion before or after the
- 7 Grenfell Tower fire, or perhaps both?
- 8 A. After
- 9 Q. After. Right. Are you able to assist us with how, in
- 10 your experience or knowledge, that body of opinion grew
- 11 up after the fire?
- 12 A. No. I can't assist you.
- 13 Q. You can't.
- 14 When you say body of opinion, was that the body of
- 15 opinion, to the best of your knowledge, held by the
- 16 majority of fire risk assessors in the industry, or
- 17 other people --
- 18 A. I can't say that.
- 19 Q. Right.
- 20 A. Yes
- 21 Q. For example, whose opinion was it, do you know? I mean, 2.2 was it government or --
- 23 A. Well, as I went on to do in chapter 10. I looked at the
- 24 FIA document.
- 25 Q. I see

# 55

- 1 Are you able to explain the rationale for that
- 2 opinion?
- 3 A. No.

7

- 4 Q. No. We know you disagree with it.
- 5 A. No, well, I can't explain it at all. But, I mean,
- I feel like I'm straying a little bit off me having 6
  - analysed Grenfell Tower, which is why I'm here.
- 8 Q. All right.
- 9 A. But I hope that the technical information I've provided.
- 10 and we might hopefully get to talk about the order
- 11 a little bit more, I haven't been able to
- 12 retrospectively prove that the external wall was right
- 13 to be excluded
- 14 Q. I see what you mean.
- 15 A. I've done a double or triple negative there. But
- 16 I haven't been able to prove that, no.
- Q. No, thank you. And in fact, taking that a little bit 17
- 18 further, isn't it right that both the Sleeping Guide and
- 19 the LACORS guide, and indeed the LGA guide, all said in
- 2.0 their different ways that the RRO applied only to the
- 21 common parts of blocks of flats or common areas?
- 2.2 Yes, so I think that is true, that's absolutely correct, Α. but that doesn't remove or directly cause the omission 23
- 24 of looking at a hazard. I think --25
  - Q. Yes.

- 1 A. So it's kind of hard to explain this, actually, but
- 2 a hazard is a hazard in a building, and I can't find
- 3 anywhere that any type of wall was expressly categorised
- 4 as being in or out.
- 5 Q. Right.

- Before the fire , was there a body of opinion, to
- 7 your knowledge, that the external wall was or should be
- excluded from the scope of a fire risk assessment 8
- 9 because it wasn't --
- 10 A Part ---
- 11 Q. -- outside the private dwelling or appurtenant thereto?
- 12 A. I was surprised to hear that, and I think we were
- 13 surprised to hear that, I can say as well.
- 14 Q. Right. So is it your --
- A. I mean, I understand -- I mean, I don't want to sound --15 vou know. I think there's always that kind of remark 16 17 about hindsight. I understand what the guidance
- 18 document said, and I'm absolutely clear that
- 19 explanations of what the external wall is for in
- a high-rise residential building are omitted from all 2.0
- 21 the guidance documents. I mean, it's important to make
- 22 that absolutely clear. There is no explanation of the
- 23 external wall as a fire safety provision and the
- 24 importance of it particularly in high-rise residential
- 25 buildings, just for balance. So I'm clear that none of

#### 57

1 that was expressed

-		that was expressed.
2	Q.	Yes. I mean, you know, because you're familiar with the
3		RRO, that by virtue of Article 6 and the definition of
4		domestic premises, domestic premises are excluded $$
5	Α.	Yes.
6	Q.	from its scope, except parts used in common.
7	Α.	Well, parts of the domestic premises $$ yes.
8	Q.	How do you square your opinion that the external wall is
9		or may present a hazard which should be assessed $$
10	Α.	Okay.
11	Q.	with the exclusion of domestic premises, save parts
12		used in common and parts appurtenant thereto?
13	Α.	So my understanding of the RRO, as a fire safety
14		engineer, is it actually splits things into three types
15		of $$ I don't know if the right word is demise or not,
16		but you have domestic, workplace, and not a workplace.
17		That's how it goes about things in the order. And
18		I understand the domestic premises are excluded with
19		respect to hazard and control, but I don't understand
20		how that makes the external wall or the internal wall
21		outside the scope. I don't understand how you
22		immediately go there.
23	Q.	I think some people might say that the external wall
24		isn't part of the common parts and therefore doesn't
25		fall within the scope of the RRO.

fall within the scope of the RRO.

58

- A. Understood, but the RRO doesn't say, "Please do a risk 1 assessment in the common parts". The RRO asks the 2 3 responsible person to deliver general fire precautions 4 by means of protective and preventative measures, 5 you know, depending on the type of responsible person they are, for workplaces, not workplaces, and, yes, 6 7 exclude the domestic premise. I understand that. But 8 it doesn't say, "Please carry out fire risk assessments 9 in the common parts and exclude external walls and 10 include internal walls". Because I think it's important 11 to also realise now that, you know, I tried to look at 12 all the ways common parts are referred to, you know, the 13 same is true of the internal wall. It's not included 14 because the wall is the workplace, it's included in that 15 risk assessment because it's a protective measure. It's 16 one of the fire safety provisions in a building. 17 Q. I see. I see.
- 18 Α Is that -- because I know this is a very controversial
- 19 subject, so I hope I'm being clear enough.
- 20 Q. It is. I just want to understand your understanding.
- 21 A. Yes.
- 2.2  $\mathsf{Q}.\;$  Before the break, can I just see if we can leave it this
- 23 way: you include the external wall as within the scope
- 24 of a fire risk assessment because it's part of the
- 25 protective measures which fall within Article 4?

#### 59

- 1 A. Yes, exactly. I can't --
- 2 Q. As opposed to not being outside the --
- 3 A. Exactly. I can't say to a client, "We've sorted out
- 4 your general fire precautions for this high-rise
- 5 residential building, I haven't looked at the wall,
- 6 here's hoping it doesn't cause extensive fire spread".
- 7 Because, you know, the truth is that if extensive
- 8 fire spread can be supported in a wall -- not all
- 9 external walls are a hazard, okay? But if it supports
- 10 fire spread, I'm unable to say to the responsible person
- 11 the classic evacuation strategy remains suitable. I may
- have to change my evacuation strategy because I can't 12
- 13 rely on that wall.
- MR MILLETT: Yes, thank you, and that actually takes me very 14
- 15 neatly to my next question and the break.
- 16 SIR MARTIN MOORE-BICK: The break before your next question?
- 17 MR MILLETT: Yes
- 18 SIR MARTIN MOORE-BICK: We will have the break now. We'll
- 19 come back, please, at 3.35. You know -- I've said this
- 2.0 to you many times already -- please don't talk to
- 21 anvbodv.
- 2.2 THE WITNESS: I don't talk to anybody anymore.
- SIR MARTIN MOORE-BICK: Very wise. Good. Thank you very 23
- 2.4 much

25

(Pause)

1	Thank you. 3.35.
2	(3.20 pm)
3	(A short break)
4	(3.35 pm)
5	SIR MARTIN MOORE-BICK: Right, Dr Lane, happy to carry on?
6	THE WITNESS: No, yes, of course.
7	SIR MARTIN MOORE-BICK: Thank you very much.
8	Yes, Mr Millett.
9	MR MILLETT: Thank you, Mr Chairman.
10	Dr Lane, can I look with you at the LGA guide,
11	please, $\{HOM00045964/111\}$ , paragraph 72.
12	Under the heading "External fire—spread" at 72.1, it
13	says:
14	"The external façades of blocks of flats should not
15	provide potential for extensive fire $-spread$ . When
16	assessing existing blocks of flats , particular attention
17	should be given to any rainscreen or other external
18	cladding system that has been applied and to façades
19	that have been replaced."
20	Then 72.2 says:
21	"The use of combustible cladding materials and
22	extensive cavities can present a risk , particularly in
23	high—rise blocks. Restrictions are normally applied to
24	the nature of such materials and in particular their
25	surface spread of flame characteristics . Cavity

1		barriers are also required in some circumstances.
2		Assistance from specialists may be required to determine
3		if the external surfaces of walls are satisfactory and
4		whether there is adequate provision of cavity barriers ."
5		Now, just looking at that, and reminding ourselves
6		that that is the LGA guide 2011, who was it who was
7		supposed to assess $$ using the word there $$ existing
8		blocks of flats and pay particular attention $$ using
9		the words there $$ to any rainscreen or other external
10		cladding system and façades?
11	Α.	So I think there is a perfectly sensible warning about
12		a hazard emanating from the construction industry. And
13		who was it? Well, the reader of the LGA guide, and so
14		the responsible person and their in – house or
15		out-of-house fire risk assessor.
16		Actually, sorry, Mr Millett, is it okay if I just
17		say something else, because I was thinking over the
18		break, about walls?
19	Q.	Yes, of course.
20	Α.	This thing about in and out. So the common lobby in
21		Grenfell was landlocked, so it doesn't touch the
22		external wall. But other buildings, the common lobby,
23		you know, again abuts the external wall. So by that
24		definition , does that mean those walls are in and not

25 other external walls? This is where I couldn't square

62

	the whole thing away in the end.
Q.	Yes.
•	I know you can't answer that question, but I think
	that's something that should be considered. Does what
	I've said make any sense?
Q.	Yes. So to take that point and perhaps bring it back to
	you, are you saying that the external wall would or may
	represent a hazard to be assessed by the responsible
	person
А	Yes.
	and/or their fire risk assessor whether or not it
ч.	abuts a compartment or a common part?
А	Yes, exactly, exactly.
<i>,</i>	Sorry, so back to this. This is a sensible warning
	about a hazard because of a trend in the industry.
0	Yes. That's very helpful.
ч.	Now, on the basis of the answer before last, the
	responsible person or their in-house or out-of-house
	fire risk assessor is supposed to do the assessment, how
	were fire risk assessors, before 2017, meant to
	incorporate their knowledge of the building envelope
	into their fire risk assessments?
А	So in this case, this is about a refurbishment, but $$
	well, "has been applied and to facades that have been
	replaced". So this is focusing particularly on
	replaced . So this is locasing particularly on
	A. Q. A. Q. A.

63

1		replacements. So a fire risk assessor would be reliant
2		on fire safety information that they could obtain
3		through the responsible person, from the parties
4		responsible for designing and installing that particular
5		type of external wall.
6	Q.	And would you have expected the responsible person or
7		the fire risk assessor, as the case may be, to be
8		reasonably sufficiently experienced and trained to be
9		able to carry out a proper assessment within the meaning
10		of section or paragraph 72.1?
11	Α.	Yes. So I think I think for this circumstance,
12		where there's new materials, I'm going to assume they
13		should be compliant with Approved Document B during
14		design. In an ideal world, there should be a fire
15		safety strategy that would provide some simple
16		description of the performance, which should be enough,
17		in my opinion, or else you would have to look at some of
18		the basic component fire safety information yourself,
19		okay? But I have to say in an ideal world, because
20		obviously there wasn't a prevalence of that information
21		available, in the spirit of balance.
22		But there's kind of all different extremes when it
23		comes to risk assessing cladding $$ I have to be very
24		careful now $$ and I think there is a way where it can
25		be quite simple if it's described adequately in

- 1 a fire strategy document, instead of having to escalate
- 2 into a scenario of detailed reviewing of a building
- 3 manual or even having to do some kind of major
- 4 inspection.
- 5 But there should be sufficient paper-based
- 6 information to enable you to understand the
- 7 combustibility of the main components of the cladding.
- 8 Q. Yes, thank you.
- A. Okay? 9
- 10 Q. Would it be enough for a fire risk assessor, when --
- 11 using the words in 72.2 - - determining if the external 12 surfaces of walls are satisfactory --
- 13 A. Yes.
- Q. -- simply to say that it had been signed off by 14 building control? 15
- A. Absolutely not, no. And I think -- so if a person isn't 16 skilled to review a certain level of detailed drawing.
- 17
- 18 or doesn't have access to a fire strategy where it's
- 19 explained, the safest thing to do and the most accurate 2.0
- thing to do is to explain the building has been re-clad, 21
- that you cannot ascertain if it is a hazard or not, and 22
- you strongly advise the responsible person, within 23 a specific timeframe, that they urgently, through
- 24 whatever means available to them, determine the
- 25
  - materials that have been used in that refurbishment.
- 65 1 Q. Thank you, that's very helpful. 2 Can I then, just to back this up a little bit, go to 3 the competency criteria again at {CTA0000003/73}, 4 please. This is part of appendix H, and if we look together at appendix H, "Fire protection", H1 on the 5 right-hand side, "Passive fire protection", if you look 6 7 a little bit lower down, it says there under the heading 8 "Passive fire protection": 9 "The fire risk assessor should have a knowledge and 10 understanding of the role in the provision of 11 fire safety, including the types of fire performance 12 requirements (load-bearing capacity, integrity, 13 insulation, reaction to fire performance etc.) of the following ... 14 15 A Yes 16 Q. And then if you go to page 74 {CTA00000003/74}, in the final section on the left-hand side: 17 18 "The building envelope, e.g. fire –resisting external 19 walls, curtain walls. 2.0 ". The significance of their role in protecting 21 escape routes at boundaries. 2.2 " • The significance of any immediately visible 23 damage. 24
- Then a reference to sandwich panel constructions 25 with a combustible insulating core.
  - 66

- 1 Does that reference there, in your opinion, support 2 the idea that a fire risk assessor should be examining 3 and forming a risk view about the hazards presented by 4 the building envelope? 5 A. So actually, yes, but also the text you showed me before you went to the building envelope, and you listed out 6 7 loadbearing capacity, insulation --Q. Page 73 {CTA0000003/73}. 8 9 A. Yes, I'm sorry, I'm not --10 Q. We can flip the page back. 11 A. Yes, is that okay? 12 Q. Yes. page 73. 13 A. I think that's really important, actually. So it says: 14 "... fire performance requirements (load-bearing 15 capacity, integrity, insulation, reaction to fire 16 performance .... 17 So in the Approved Document B, in the fire strategy. 18 it should list the insulation and its performance, the 19 reaction to fire performance, particularly when it comes 2.0 to the external wall, and so there is a level of 21
  - understanding needed of that fire safety provision, not
- 22 necessarily a vastly in-depth understanding down to the 23 tiny little gubbins that go into cladding, but that
- 24 basic main component fire performance as written there,
- 25 first of all, and then we go to your wall section on the

- 1 other page.
- 2  $Q.\ \ Can$  we turn the page, please, to page 74 3
- {CTA0000003/74}.
- 4 A. Yes 5 Q. Bottom left.
- 6 A. So, "The significance of their role in protecting escape 7 routes at boundaries", you know, that's to do with 8 escaping past a wall and it having to have 9 fire resisting properties, okay? Which is different to 10 reaction to fire properties. 11 "The significance of any immediately visible damage" 12 is relevant to sandwich panels used in external walls, 13 because once they're damaged or have any kind of -you know, it means their risk of ignition rises because 14 15 the combustible material within them is exposed. 16 So I see those two separate things, one about 17 a fire resisting wall and the other about a wall 18 requiring reaction to fire performance, the classic 19 external wall performance, very helpful advice about 2.0 considering those two things. 21 Q. How much would you need to know, as a reasonably 2.2 competent fire risk assessor, about the requirements of 23 Approved Document B, section 12, and fire performance 24 classifications ?
- 25 A. How much would you need to know? Well, you need to know

- 1 what the standard is.
- Q. For example, would you need to know whether or not your
   external wall complies with diagram 40?
   A. Oh. Would you need to know if it --
- 5 Q. In order to be able to --
- 6 A. No, because --
- 7 Q. -- discharge its obligation.
- 8 A. Because when a risk assessor is relying on the building,
- 9 they have to understand its performance as the original
- 10 fire safety provision. So, yes, they do need to
- 11 understand -- if it's a modern building, yes, they need 12 to have some understanding of the performance
- 12 to have some understanding of the performance 13 requirements, one of which is diagram 40, yes.
- 13 requirements, one of which is diagram 40, yes.
- 14 Q. Right. So therefore would you expect the reasonably
  15 competent fire risk assessor to have sufficient training
  16 to be able to understand what it is he is looking at
  17 from that perspective?
- 18 A. Yes, I think it's incredibly difficult to provide
- an adequate description of hazards without understanding
   fire safety provisions. So I think that means yes,
- 21 I think.
- 22 Q. Thank you.
- 23 A. Yes.
- 24 Q. In your experience, in the industry generally, did fire 25 risk assessors, your run of the mill fire risk assessor,
  - 69
  - have that kind of training?
  - 2 A. No.

14

- 3 Q. Moving to April 2017, I just want to ask you a questionabout the LFB's approach in that year?
- 5 A. Yes.
- 6 Q. This is {CST00003138}, and it's the letter of
- 7 6 April 2017 from Assistant Commissioner Dan Daly to
- 8 chief executives of London boroughs. It went widely,
- 9 and it's entitled "Tall buildings external fire
- $10 \qquad$  spread". It's a document on this occasion addressed to
- 11 Laura Johnson at RBKC, but it went, as I say, widely,
- and it's a document we've looked at a number of times inthe course of Phase 2 of this Inquiry.
  - Can we go to the second page of this letter
- 15  ${CST00003138/2}$ , please, the last paragraph, first two
- 16 sentences. Assistant Commissioner Daly says this:
- 17 "I would therefore strongly urge that you consider 18 this issue as part of the risk assessment process for
- 19 premises under your control. I suggest that you make 20 sure all relevant information about any replacement
- 21 window and facade schemes is fully available to fire 22 risk assessors."
- 23 First, do you agree with the approach urged by 24 Assistant Commissioner Daly here?
- 25 A. Yes, I do. I think it's another -- just as the LGA

70

1 provides helpful information about the hazard a wall can 2 pose, I think this is a very sensible letter warning 3 people about a hazard emanating from the materials being 4 used by the construction industry. Q. Yes. 5 6 Are you able, from what you know, from your 7 experience at the time rather than reading documents in the Inquiry, to explain the basis on which Mr Daly 8 9 formed the view and told Laura Johnson that fire risk 10 assessors should be assessing the fire safety of façade 11 schemes? 12 A. Well, I mean, I don't know why -- I don't think I've 13 ever met Mr Daly and I don't know why he wrote this 14 letter, but I think -- this is 2017, isn't it? 15 Q. Yes. it is. 16 A. And I've made it clear to you that from 2013, my own 17 personal experience was the prevalent use of those 18 materials and a rising sense of concern in certain 19 parts, in my experience about insulation, but I was 2.0 aware of other people's concerns about materials beyond 21 insulation. So if, you know, I had read that letter on 22 the day, it would simply have reflected ... 23 Q. Your view? 24 A. What do you say, you know, that moment in time. 25 whatever, yes.

# 71

- 1  $\mathsf{Q}.\;$  How, in practice, at the time would fire risk assessors address the information set out in Mr Daly's letter? 2 3 What would a fire risk assessor do, do you know? 4 A. Well, I know what they should do, but I've never spoken 5 to someone who did do it, if that's what you're asking 6 me. 7  $\mathsf{Q}.\;$  That's helpful, but can you tell us in brief what they 8 should do? 9 A. Well, I think I kind of tried to explain that in 10 chapter 10. So it depends on the number of buildings. 11 I've explained about what KCTMO did, and Mr Stokes did, 12 but because a lot of this ends up becoming about 13 information, making sure you have the information to 14 determine if it's a hazard or not, and then if you don't 15 have the information, my reading of the letter was 16 a warning that you needed to go about getting that 17 information, and therefore be in a position to confirm 18 if that hazard existed in the building the responsible 19 person was responsible for. 20 So it was about information and taking the time to 21 start doing -- you know, starting to categorise. 2.2 you know, starting to understand if that hazard existed
- 22 you know, starting to understand in that hazard existence23 in your portfolio or building or if it did not.
- 24 Q. Yes.
- 25 A. And, you know, there was nothing unsensible -- you know,

1		"short, medium and long term actions to address the	1	information they did no
2		risk". So it was about preparation and understanding	2	the missing information
3		and then taking sensible steps to resolve a hazard if	3	information forming the
4		a hazard was found.	4 G	). And the consequences
5	Q.	Thank you.	5 A	. Yes. So, I mean, this
6		Can I then turn to the next topic, which is	6	cladding to, in this p
7		gathering information, arising out of your last answer	7	vulnerable residents in
8		in fact, but a different topic.	8 G	). Yes, it's an example.
9		Would you expect the responsible person to be	9 A	A. As an example, there w
10		sufficiently familiar with its obligations under the	10	information had been o
11		RRO, as identified in the relevant guidance, to know	11	actually, when that's
12		that it had to provide the fire risk assessor with all	12 0	). And we'll come to that
13		up-to-date information relevant to the FRA that they are	13 A	. Yes.
14		about to undertake?	14 G	). But I'm using that as a
15	Α.	Would I expect that? Yes, I would, yes.	15	Would it be norma
16	Q.	And you would expect that, would you, in just the same	16	responsible person to i
17		way as if it were carrying out the risk assessment	17	the appointed fire risk
18		itself in house?	18	information needed for
19	Α.	Absolutely, because you can't do a suitable and	19	assessment?
20		sufficient risk assessment without information.	20 A	. Yes, I think so, becau
21	Q.	No.	21	sure what it is that yo
22		Now, can I show you what Janice Wray said on	22	for them, so there's ar
23		{Day142/135:6-10}.	23	my experience. We wo
24		At line 6 she is asked:	24	a minimum we require
25		"Question: Do you recall whether, before or after	25	available, something h
		73		
1		his visit to carry out a fire risk assessment, Mr Stokes	1	means the inspection y
2		ever asked you for up-to-date information about disabled	2	inspection of, you kno
3		persons at Grenfell Tower?	3	because there is no otl
4		"Answer: I don't recall him asking me."		). Right.
5		If you go on to {Day142/137:14}:		<ol> <li>So I see it as two way</li> </ol>
6		"Question: I think from your earlier evidence this	6	responsible person and
7		morning, but just confirm, it's right, isn't it, that	7	to come to a conclusio
8		you never actually considered telling Carl Stokes that	8	basis of the risk asses
9		before he carried out each FRA, or rather when you gave	9 G	). Right.
10		him the list of FRAs to do, you never told him about the	10	Would it follow fro
11		number of vulnerable residents that the TMO had	11	that where the fire ris
12		identified in those buildings?	12	information or advise t
13		"Answer: I don't believe I did, no.	13	information relevant to
14		"Question: And why is that?	14	the responsible person
15		"Answer: It was clearly a major oversight. I can't	15	unnecessary or irreleva
16		give you any other explanation, I'm sorry."	16 A	. Safely assume? So I d
17		Just on that evidence, if a fire risk assessor in	17	assessor should conduc
18		the position of Carl Stokes wasn't given the information	18	do, you know, I have s
19		that we looked at with Ms Wray there, would you have	19	person, but I would ex
20		expected them to ask for it?	20	I'm thinking about Gre
21	Α.	Yes.	21	I would expect the per
22	Q.	Yes, and if not given it despite asking for it, what	22	person there to be very

- $\mathsf{Q}.$  Yes, and if not given it despite asking for it , what 22 23 would you expect a fire risk assessor to do about it?
- 24 A. Produce a risk assessment on the basis of a clear
- 25  $\ensuremath{\mathsf{explanation}}$  of what information they had and what

1		information they did not have, and the consequences of
2		the missing information. So a clear explanation of the
3		information forming the basis of the risk assessment.
4	Q.	And the consequences of not having that information?
5	Α.	Yes. So, I mean, this particular $$ we've jumped from
6		cladding to, in this particular case, regarding
7		vulnerable residents in Grenfell Tower.
8	Q.	Yes, it 's an example.
9	Α.	As an example, there were statements made as if
10		information had been considered quite thoroughly,
11		actually, when that's not the case, as we now know.
12	Q.	And we'll come to that.
13	Α.	Yes.
14	Q.	But I'm using that as an example here.
15		Would it be normally accepted practice for the
16		responsible person to rely on the fire risk assessor,
17		the appointed fire risk assessor, to identify
18		information needed for them to complete the fire risk
19		assessment?
20	Α.	Yes, I think so, because sometimes people aren't quite
21		sure what it is that you need to do your job properly,
22		for them, so there's an exchange at the start. That's
23		my experience. We would issue a list of documents as
24		a minimum we require before we start, and if they're not
25		available, something has to be done. Sometimes that
		75
		75
1		means the inspection you do has to be well beyond the
2		inspection of, you know, a classic risk assessment,
3		because there is no other information to rely on.
4	Q.	Right.
5	Α.	So I see it as two ways, is that okay: I think it's the
6		responsible person and the risk assessor together need
7		to come to a conclusion on the information forming the
8		basis of the risk assessment.
9	Q.	Right.
10		Would it follow from that $$ perhaps it doesn't $$
11		that where the fire risk assessor doesn't ask for
12		information or advise that he should be given
13		information relevant to the fire risk assessment, then
14		the responsible person can safely assume that it's

ant?

referring to?

25

- don't think a competent fire risk
- uct themselves like that. If they
- some sympathy with the responsible
- expect the person representing --
- Grenfell Tower particularly now --
- erson representing the responsible
- person there to be very familiar with the information 22 23 required. They had a warning before, as we know now.
- 24 Q. Yes. Yes. You're referring  $\,--$  well, what are you

- 1 A. I'm referring to the Salvus audit, where they set out
- 2 really clearly that each building in KCTMO's property
- 3 needed its own fire safety file , or they might have used
- a different word. There is just a basic level of 4
- 5 information any person responsible for a building needs,
- you know, for maintenance purposes, risk assessment 6
- 7 purposes, all different purposes.
- 8 Q. Well, we'll come back to the September 2009 Salvus 9 report later in your evidence.
- 10 Can I then ask you some questions about frequency.
- 11 We can proceed, I think, on the basis that
- 12 Article 9(3) of the RRO requires that fire risk
- 13 assessments should be reviewed regularly so as to keep
- 14 it up to date
- 15 A Yes
- 16 Q Yes
- 17 A. Yes
- 18 Q. And particularly if there is a reason to suspect that 19 it's no longer valid or there has been a significant
- 20 change
- 21 A. Yes

- Q. Can I just show you {BLARP20000027/139}, 2.2
- 23 paragraph 8.2.23 of your report at chapter 8. Here it
- 24 is that you address the TMO's arrangements for carrying
  - out reviews of their fire risk assessments and new fire

77

- 1 risk assessments, as set out in section 14.3 of their
- fire safety strategy of November 2013. You quote from 2 3 it there.
- 4 If you go over the page in this report to page 140 5  $\{BLARP20000027/140\}$ , you set out at the very top of the 6 page, still within paragraph 8.2.24, paragraph 14.3.4, 7 which savs: 8
- "The FRA will usually set out the timescale within 9 which the regular review will be required - generally 10 for properties assessed by us as being 'potentially high
- 11 risk' this will be required on an annual basis. We
- 12 would aim to carry out a new FRA on a 3-yearly basis." 13 If you look below that, you say at 8.2.25:
- 14 "In my opinion, these arrangements, if properly
- implemented, would adequately enable compliance with 15 article 9 of the RR(FS)O." 16
- 17 Now, Mr Todd says that it's commonly considered that
- 18 the best practice is for FRAs for most buildings to be
- 19 reviewed annually. Just for our reference that's
- 2.0 paragraph 3.25 of his main report {CTA00000011/24}. Do 21 you agree with him?
- 2.2 A. Sorry, I thought you were talking about the new on the
- 23 three-yearly. So we're on review now. So I think a new
- 24 FRA on a three-yearly basis, I'm aware that that was
- 25 actually quite common practice, although I've always

78

- 1 thought it should be two, and a review every year in
- 2 high-rise residential buildings I would agree is
- 3 adequate, yes. 4 Q. Yes.
  - Now, we know for a fact that the FRAs for
- 5 Grenfell Tower were done irregularly, at irregular 6
- 7 intervals, so September 2009, December 2010,
- 8 November 2012, October 2014 and April and June 2016.
- 9 A. Yes.
- 10 Q. In your opinion, would the fire risk assessment trade
- 11 regard those frequencies as regular?
- 12 A. For a full fire risk assessment or --
- 13 Q. Yes.
- A. So I think every two years for a full fire risk 14
- 15 assessment is quite common. Doing a review in between 16 is also common
- 17 Q. I see. So you agree that if there had been spot checks
- 18 annually by the TMO to ensure that FRA actions were
- 19 being completed, is it your opinion that that would be
- regarded as satisfying the requirements? 20
- 21 A. It could be, if everything is happening -- if the
- 22 actions are being closed out and things are being done
- thoroughly, yes. I wouldn't criticise that timing, no, 23
- 24 on its own. 25
  - Q. Right.

# 79

- 1 A. But it's the effectiveness of what's done each year and
- 2 the effectiveness of the full risk assessment every
- 3 two years.
- 4 Q. Yes.
- A. But I wouldn't criticise a really well done system like 5 6 that, simply because of time, no.
- 7 Q. I see. So you don't criticise the frequency --
- 8 A. No.
- 9 -- for Grenfell Tower? 0
- 10 A. I haven't criticised the frequency of every two years, 11
- 12 Q. Can I ask you then to look at the same part of this
- 13 report at page 425 {BLARP20000027/425},
- 14 paragraph 17.8.1, still within chapter 8.
- 15 You say, and this is under the heading, "Mr Stokes' 16 understanding of the preventive and protective measures
- 17 in Grenfell Tower after handover":
- 18 "Finally, KCTMO as responsible person had a critical
- 19 activity once the primary refurbishment works were
- 2.0 complete - and that was to ensure a fire risk assessment
- 21 for Grenfell Tower was carried out, capturing the effect
- 2.2 of the new works, and formulating the resulting general
- 23 fire precautions by means of a suitable and sufficient 2.4 risk assessment."
  - Then at 17.8.2.

25

1 "Once practical completion occurred in July 2016, 2 this was a moment in time, based on my own professional 3 experience, to carry out a thorough fire risk 4 assessment, taking into account all the new systems, fixtures and fittings in Grenfell Tower." 5 6 Then over the top of the page at page 427 7 {BLARP20000027/427}, two pages on, you say there at 8 paragraph 17.8.8: 9 "Yet the evidence shows [that] Mr Stokes only 10 provided a summary update to his previous fire risk assessment documents in June 2016 only." 11 12 Now, just to be clear, if we can, is it your opinion 13 that Carl Stokes should have been instructed to carry 14 out a new FRA on Grenfell Tower after practical 15 completion in July 2016? A. Yes. 16 17  $\mathsf{Q}.\;$  And not earlier than 20 June 2016, when he was in fact 18 instructed? 19 A. If the KCTMO thought they had another reason for doing 20 a risk assessment at that time, I understand there may 21 have been some other reason, but in terms of the final 2.2 condition of the building, it needed to also occur after 23 practical completion. 24 Q. Can you explain why? 25 A. Because there was so much work done in Grenfell Tower to

81

1		passive and active protection measures, it wasn't
2		possible to rely on old descriptions or theoretically
3		old drawings. But as we know, there is no evidence that
4		drawings were used anyway. So there was a need to
5		understand the performance of all the new active and
6		passive systems, and record them, and explain how they
7		would be relied upon in the event of a fire .
8		I mean, are you asking me in the sense of review
9		versus full or just the timing?
10	Q.	I'm asking you full.
11	Α.	Yes, no, absolutely, because so many things have
12		changed, you know, the smoke control system, you know,
13		there was all sorts of things had changed, were
14		different, required consideration.
15	Q.	Yes. When you say he only provided a summary update to
16		his previous fire risk assessment, which was April 2016,
17		why do you say that it was only a summary update?
18	Α.	Because it didn't explain the resulting protective
19		measures from the refurbishment works.
20	Q.	Right.
21	Α.	And, you know, what was meant to happen or not with
22		respect to the tower, okay?
23	Q.	I see.
24		In your opinion, should Carl Stokes have told

- In your opinion, should Carl Stokes have told 24 25
  - Janice Wray that a new FRA was needed after completion
    - 82

1		of the refurbishment?
2	Α.	Yes, I think he should have known that and raised it,
3		yes, and equally Ms Wray, the responsible person, should
4		know that. And it's something that's actually quite
5		commonly documented as well, if one didn't know.
6	Q.	Thank you.
7		Can I then turn to a different topic, which is FRA
8		actions.
9	Α.	Yes.
10	Q.	I just want to ask you first about the general recording
11		of risk in action plans.
12	Α.	Yes.
13	Q.	We can stick within chapter 8 of your report, where we
14		are, and go, please, back to page 184
15		{BLARP20000027/184}.
16		At page 184, paragraphs 9.1.14 and 15, you say this:
17		"9.1.14. The most significant purpose of a fire
18		risk assessment is to estimate the level of risk, and
19		provide clear guidance on any actions required, to
20		reduce or maintain that level of risk as trivial or
21		tolerable .
22		"9.1.15. Mr Stokes did not explain or record the
23		purpose of any action derived by him, as a result of his
24		risk assessment, as being relevant to the control of
25		a specific hazard. By this I mean he did not record how
		22
		83

1		any action or a failure to complete any specific action
2		would impact the risk level for the premises."
3		Now, a number of questions flow from that.
4		First, should the connection between each risk and
5		each action be explained, one by one, in the main body
6		of a fire risk assessment?
7	Α.	Yes, I think so, yes.
8	Q.	Can you just explain why it was important for a fire
9		risk assessor to do that?
L 0	Α.	Because it helps the responsible person understand which
11		actions are a risk $$ you know, which actions are the
12		most serious risk to life or not, and a timed programme
13		of work can be developed between them. Because
14		a specific identified risk may pose, say, a very high
15		level of harm to the relevant people, but may not be
16		something that can be dealt with very honestly and
17		practically in the short term, okay? So that's why the
18		risk levels of each one, it's important to understand
19		them, and then the timing possible, practically and
20		honestly, of each one, they need to be separated, and so
21		a sensible action plan exists on the record and
22		a sensible risk level can be agreed for that moment, and
23		how it will change for the building as you move through
24		closing out your actions. So ${\sf I}$ see it as quite dynamic.
25	Q.	Is that a reason why one shouldn't do a risk assessment

- 1 generically or cumulatively?
- 2 A. I'm sorry, I don't actually know what you mean by that. 3 Q. Okay, let me try it a different way.
- 4 Would it be reasonable for a fire risk assessor to
- lump all the risks together and produce a generic risk 5
- 6 assessment or a cumulative risk assessment?
- 7 A. You mean a final risk level?
- 8 Q. Yes.
- 9 A. No, I don't agree with that, because the whole point of 10 bringing risk assessments into the fire space in the 11 first place was for the responsible person to have 12 a more active part in controlling risk in the building. 13 It's an ongoing matter. In a way, it never ends. And 14 they have to have clear help about, you know, what can 15 happen in the short, medium and long term, and what risk 16 they continue to carry until those actions are closed 17 out. Because if a specific hazard can cause significant harm but you genuinely can't fix that,  $\, {\rm let}\, {\rm 's}\,$  say it 's 18 19 going to take you three years to fix it, the responsible 20 person has to understand that they are carrying that 21 risk and that risk exists to the relevant people in 2.2 their building, and they have to make a decision if 23 they're prepared to accept that risk level or they're 24 going to do something else in the interim. So -- sorry. 25
  - $\mathsf{Q}.\;$  That's very helpful, thank you, you have explained it

1		very fully, I think.
2		If we go on, please, in this report to page 206
3		$\{BLARP20000027/206\}$ , and let's look together at
4		paragraph 9.8.18, you say there:
5		"His failure [that's Mr Stokes] to connect the
6		actions required to a potential consequence for the
7		relevant persons in his technical method, and more
8		importantly his failure to communicate the connection to
9		consequences in his documentation, was a significant
10		one."
11	Α.	Yes.
12	Q.	Now, just again a clarificatory question from me: are
13		you saying that Mr Stokes should have spelt out to the
14		TMO the particular possible consequences of not taking
15		each of the remedial actions that he was advising should
16		be taken?
17	Α.	Yes, because risk is formulated from two parameters:
18		probability and consequence. So by assigning a risk
19		level to each hazard, that's basically what you're
20		doing.
21	Q.	I see.
22	Α.	So he needed to explain that.
23		When you step right back and think about
24		Grenfell Tower, the KCTMO were in a position where it
25		was tolerable every year and sometimes $90\%$ of their

86

1		actions were high priority . Okay? And I think,
2		you know, I would like to be a bit clearer about that.
3		If you're a responsible person and you have a building
4		stock where everything is apparently high priority all
5		the time, you need to sit down and actually understand:
6		what does that really mean? How much risk am I carrying
7		here, and how much risk am I causing to my relevant
8		persons? Okay?
9		So that's why splitting the risk level for the
10		different types of hazards one finds, some of them are
11		quite trivial , some of them can be quite serious, and
12		then formulating action plans and measuring oneself on
13		a sensible action plan, is my understanding of what the
14		order was asking everybody to do.
15	Q.	I see. And from the TMO's perspective, is it right that
16		it would gain, from a risk-by-risk approach rather than
17		a cumulative approach, enough information to be able to
18		understand the probability and the consequence $$
19	Α.	Exactly.
20	Q.	so that it could decide in an informed way whether to
21		accept that risk?
22	Α.	Exactly, and that's a really important part, a really
23		important outcome from a risk assessment.
24	Q.	Yes, I see.
25	Α.	Okay.

## 87

1	~	
1	Q.	Can I then turn to the question of timescales for FRA
2		actions, and let's start with PAS 79, which is at
3		{CTA0000003/59}, please.
4		This is the commentary in PAS 79 to clause 19.2, and
5		if we look at the left $-hand$ side of the page there,
6		there it is, you can see (ii) there, and it says:
7		"In formulating an action plan for premises in which
8		the fire risk has been assessed as unacceptably high,
9		the analytical approach to fire risk assessment permits
10		backtracking to determine whether, in effect, the
11		problem arises from inadequate fire prevention (i.e.
12		inadequate means for control or elimination of fire
13		hazards), inadequate fire protection (e.g.
14		unsatisfactory means of escape or fire warning systems),
15		shortcomings in fire safety management, or a combination
16		of these."
17	Α.	Yes, yes.
18	Q.	Focusing on shortcomings in fire safety management
19		there
20	Α.	Yes.
21	Q.	how would you expect a reasonably competent fire risk
22		assessor, or rather a fire risk assessor aiming to
23		produce a reasonably competent fire risk assessment, to
24		assess shortcomings in fire safety management?
25	Α.	So, first of all, they have to understand the
25	Α.	So, first of all, they have to understand the

- 1 arrangements in place, and then, in the position
- 2 Mr Stokes was in, where he had the benefit of inspecting
- 3 so many premises, he had the practical means to
- 4 understand how those arrangements were being implemented
- 5 in very many buildings, including Grenfell Tower. So
- 6 I would expect a review of the arrangements as the 7 responsible person planned or understood them to be
- 7 responsible person planned or understood them to be, and
- 8 then, you know, one's observations in practice of what 9 was really happening in the building. And you know
- 9 was really happening in the building. And, you know, 10 you can work that out from say the repetitiveness of
- 10 you can work that out from, say, the repetitiveness of 11 a defect or not, and there's other signs in a building
- 12 that the arrangements are being consistently implemented
- 13 or not.
- 14 Q. I see

- 15
   What kinds of shortcomings -- if you can just give

   16
   us an example -- in fire safety management would you
- 17 expect a fire risk assessor aiming to produce
- $18 \qquad \ \ \,$  a reasonably competent assessment to identify?
- 19 A. What kind of shortcomings? Okay, well, so --
- 20 Q. It's an open-ended question, I accept, but can you give 21 us some examples?
- 24 happening, or the quality of fire door, say, closing and
  - closer seems to be deteriorating with time, you know.

#### 89

- 1 So either changes in the protective measures relied upon 2 or consistent failures to inspect them, something like 3 that. 4 Q. Thank you. That's helpful. Does the paragraph that we're looking at tell us --5 and we can read it and work it out -- that a fire risk 6 7 assessor should work back from the problem to the source 8 of the problem and to work out whether one of the 9 reasons for the problem which leads to the unacceptably 10 high risk is defects in the fire safety management 11 system? 12 A. Yes, yes, and that's exactly why you deal with each 13 hazard in turn, because some of them may be a one-off 14 and if the responsible person -- you just say, "Look, 15 that just can never happen again", or some of them will 16 be caused by either an absence of something in the 17 management system or the failure to do something 18 properly. 19 So, yes, that's why splitting them out is so 20 important, and again it means then the responsible 21 person can do a sensible action plan: what's wrong in my 2.2 organisation, versus what's the problem with the type of 23 fire door I've installed?
- 24 So, yes, it's a very broad range of issues that
- cause risk levels to rise in a building.

90

1 Q. And you're saying, I think, from your answer a minute or 2 two ago, that a fire risk assessor in the position of 3 Carl Stokes, who had a view of very many buildings 4 within his instructions, was in a better position to 5 form a clear view about fire safety management? A. Yes. I mean, in my mind he was in a great position, 6 7 because one of the really useful things when you're doing a risk assessment is actually getting to talk to 8 9 people who have responsibilities day to day, and by my 10 experience also talking to residents, and you get to hear about the reality of things as opposed to the nice 11 12 policy written on the paper. 13 Mr Stokes got to see all different types of properties, got to meet all different types of people, 14 15 and he could form a -- he should have been able to form 16 a really thorough view on how the organisational 17 arrangements were genuinely being implemented in each 18 property. 19 Q. Yes. 20 Can we then stick with this page of PAS 79 21 {CTA0000003/59} and look at (iii) on this page in the 22 left -- hand column. It says: 23 "The action plan is an inventory of actions, 24 normally prioritized and time restrained, to devise, 25 maintain or improve controls."

## 91

- 1 When it says time restrained, what do you take that 2 to mean there? 3 A. So time restrained means there is a start and finish 4 date, and that's relevant to this issue of risk 5 acceptance, which I think is a very important point to 6 bring out. 7  $\mathsf{Q}.\;$  What would you say was the purpose of adding 8 a timescale, a time limit? 9 Because that risk may only be suitable to carry for Α 10 a very specific period of time. 11 Q. Yes, and would the -12 A. And to ensure -- sorry, also to ensure, you know, that 13 you can't carry the risk longer than that timeframe, and 14 if I come back and find it again, now we're entering 15 into very different territory, because it means your 16 fire safety management system is not able to close out 17 these issues when they're notified to you. So that's 18 the point of having these deadlines, but the deadlines 19 being sensible as a function of the hazard. 20 Q. Yes. So the deadline would be an indication, would it, 21 of the gravity or the seriousness of the risk? 2.2 A. The seriousness of the risk and the practicality of 23 dealing with the risk, because some risks are
  - extraordinarily complex to deal with.

2.4

25 Q. On that note, would a fire risk assessor normally take

September 7, 2021

1

1

1

1

1 1

1

1 1

1

2

2

2

2

2.

2

1		account of the expense of the remedial action when
2		recommending a deadline?
3	Α.	When recommending a deadline? In my mind, the
4		deadlines $$ I work with the responsible person to
5		derive deadlines for very complex issues, and complexity
6		can be driven by cost constraints as one parameter
7		driving complexity, yes.
8	Q.	What about complexity of the remedy?
9	Α.	Yes, but that's what I mean. So the remedy may be very
0		expensive and time-consuming, and so it has to be
1		planned out as a function of budget availability ,
2		et cetera.
3	Q.	Right, I see, and that would produce a particular risk,
4		and then the question $$ is this right? $$ for the
5		responsible person is whether that risk should be
6		carried for that period or whether there should be some
7		mitigating measures?
8	Α.	So then if you've agreed: the earliest I can get this
9		thing sorted out is three years, but you've told me it's
0		causing, let's say, medium to high $$ it may cause
1		medium to high harm to the people in my building, it
2		might be for that three—year period you need to
3		introduce another control into the building until that
4		particular action is closed out.
5	Q.	Yes, thank you.
		00
		93
1		If you look, please, at (iv), a little bit lower
2		down the screen on the same page in PAS 79, item (c)
3		there, and also $(v)$ on the right-hand side of the page
4		I'll show you in a moment, it says that the FRA must opt
5		for the most cost-effective solution. The question:
6		"Have the most cost—effective solutions been
7		chosen?"
8		If you go to (v) on the right—hand side of the page,
9		it also makes the same point there in the second
~		

- 10 sentence
- 11 "The fire precautions proposed ought to be the most 12 cost-effective available ... '
- 13 Would that mean that an otherwise urgent remedial 14 action should get a longer period for cure for purely 15 financial reasons?
- 16 A. Sorry, say that last bit again, sorry.
- 17 Q. Does the reference there to looking for the most
- 18 cost-effective solution possible mean that it would be
- 19 reasonable for the responsible person or the FRA to
- 2.0 allocate a longer period for remedy for financial
- 21 reasons on what is otherwise an urgent remedial action?
- 22 A. Oh, yes, I'm not sure I agree with that. You see, what
- 23 does cost-effective mean? Anyway, sorry. So
- 24 cost-effective is more than how much cash I'm going to
- 25 spend. I mean, in my mind, in a risk assessment, it has

94

- 1 to be balanced with consequences. Okay? 2 Q. Yes. 3 A. So there will be different ways to solve a problem. You 4 see, we have to be careful about what problem we mean. 5 But if that's meant to read -- and I don't read it that 6 way -- that you must always pick the cheapest solution, 7 I don't agree. Cost-effective has other parameters 8 associated with it. 9 If an action can cause extreme harm and it's 10 genuinely going to take a few years to resolve, then 11 other control measures will be required and they will 12 have cost associated with them. 13 Q. I see 14 Can we then look at Mr Stokes' timescale in his 15 action plans for Grenfell Tower in December 2010 and 16 November 2012 17 First,  $\{CST00003165/1\}$ . This is his 18 29 December 2010 action plan, and if you look at page 1 19 there, you can see that his timescales there are high, 20 two to three weeks; medium, one to two months; low, 21 three to six months. You see that? 2.2 A. Yes. 23 Q. Then if we go to the November 2012 action plan at 24  $\{CST00003083/1\}$ , you can see there that they are now 25 high, two to three weeks; medium, two to three months; 95
- 1 low, six to 12 months. So the medium and low have been 2 extended out a bit from one to two months to two to 3 three months, and from three to six months to six to 4 12 months. 5 Those changes there in the medium and the low, were 6 those timescales recommended by any government guidance 7 or any version of PAS 79 that you know about? A. Yes, like, I think the government -- some of the 8 9 guidance documents suggest some timeframes, yes, but 10 I think they're all very clear that -- well, my 11 understanding of them is they're still quite clear that 12 they're not -- you know, everything can't fit into those 13 timescales, okay? 14 Q. No. Perhaps we're at slightly cross-purposes. 15 Mr Stokes told us -- for our reference, this is at 16 Day137/34 and Day137/36 — that he had got the 2010 17 timescales from the Sleeping Guide and the 2012 18 timescales from the LGA guide. 19 A. Yes. 20 Q. We're not sure we can find those there.

  - 21 A. That's correct, yes.
  - 22 Can you help us with whether he's right about that? Q.
  - 23 Α. No, I don't know how we would find them.
  - 24 Q. Right, so you don't know about that.
  - 25 A. Yes

September 7, 2021

1

2

3

4

5 6

7

8

9

10

11

12 13

14

15

16

17

18

19

20

21

22 23

24

25

1 2

3

4

problem" -

A. Exactly.

1	Q. Are timescales or were timescales routinely something	
2	for the decision of the individual fire risk assessor on	
3	a case-by-case basis?	
4	A. Yes, that would be my understanding. I mean, some risk	
5	assessors have a "today" band, so they say, "Before we	
6	leave today, this has to be resolved". So I think there	
7	are no rules on timing for the very good reason the	
8	hazards $$ you know, it depends what's happening in the	
9	building.	
10	Q. I see.	
11	Are you able to help us on whether there is any	
12	government guidance at all or any other document which	
13	would have prompted a change in the timescales between	
14	December 2010 and November 2012 $$	
15	A. I don't know, I haven't thought about that, I'm really	
16	sorry . I'd have to go and read $$ I didn't think about	
17	the change and I didn't check if it came from somewhere,	
18	so I can't answer that question.	
19	Q. Mr Colin Todd told us that he wasn't aware of any	
20	such ——	
21	A. Yes, I mean, I'm not aware day-to-day, but I'm not aware	
22	of a change in the rules for timing because there are no	
23	rules for timing.	
24	Q. Right.	
25	SIR MARTIN MOORE-BICK: Can I just ask, do you have any	
	97	
1		
1 2	comment on what might appear to be a rather mechanistic	
2 3	way of setting these time limits? I understood the	
4	force of what you said about making the responsible	
4 5	person aware of the risk that's being carried $$ A. Yes.	
5 6		
7	SIR MARTIN MOORE–BICK: — and so on. That would suggest that each risk ought to be considered individually —	
8	A. Yes.	
9 10	SIR MARTIN MOORE—BICK: —— and a timescale for its remedy	
10 11	being based on the nature and severity of that risk . A. That's correct.	
12	SIR MARTIN MOORE–BICK: Which is rather inconsistent with	
13	having a sort of set of blocks like this.	

- 14 A. Exactly.
- 15 SIR MARTIN MOORE–BICK: But is this a common way of doing 16 it?
- 17 A. So I agree with you fully and that's why we do them
- 18 individually , okay? I think there are examples of time
- 19 limits to get actions closed out in other people's risk
- 20 assessments, yes, there are time limits, but I think
- 21 I said earlier, I mean, over 90% of Mr Stokes' actions
- 22 on Grenfell Tower were high priority, you know, all the
- 23 time, and that's where this system falls down without
- thinking about the individual risk items.
- 25 SIR MARTIN MOORE-BICK: I mean, one might have thought that 98

fairly soon" --A. Yes SIR MARTIN MOORE-BICK: -- then have a discussion with the responsible person about the nature of the risk, and --A. Exactly. SIR MARTIN MOORE-BICK: -- either agree on a time limit, or, if the responsible person doesn't agree with the fire risk assessor, he notes his advice, and --A. Exactly, yes, and that's exactly what we do, and, you know, I've had plenty of arguments with people about timing, and that's when cost comes in, and this is why this whole thing about risk acceptance is so important. We might say, "We strongly advise you to get this thing done in two years". The responsible person would say, "You just don't understand, I cannot get it done in less than four years", okay, for whatever reason, and you have to describe that, and you say, "If you go past two years, we strongly advise you to implement this control mechanism". Responsible persons will say no or sack you, you know, if agreement can't be reached. 99 Okay? So it is a very interactive process -- it should be -- between the responsible person and the risk assessor, and for the KCTMO at the Grenfell Tower and

there would be a process of consultation in that the

fire risk assessor would say, "I've discovered this

SIR MARTIN MOORE-BICK: -- "I think it ought to be done

5	what it was part of, that was something that could have
6	been enormously beneficial to them.
7	SIR MARTIN MOORE-BICK: Right, thank you very much.
8	I'm sorry, I rather interrupted your flow,
9	Mr Millett, but it may be that that's a point at which
10	we could interrupt it overnight.
11	MR MILLETT: We could. It gives rise to a number of
12	questions which would take about five minutes to finish
13	off the line, but we've gone past the hour and I can
14	happily do it in the morning, and we're making good
15	progress.
16	SIR MARTIN MOORE-BICK: Are we?
17	MR MILLETT: Yes.
18	SIR MARTIN MOORE-BICK: Well, you probably wouldn't mind
19	stopping at this point, would you?
20	THE WITNESS: That's fine, yes.
21	SIR MARTIN MOORE-BICK: All right. Well, we'll stop there
22	for the afternoon. We'll resume at 10 o'clock tomorrow,
23	please, and we'll see you then. Thank you.
24	(Pause)

25 Right. Well, thank you very much, Mr Millett. I'm

1	sorry if I rather truncated your questions.
2	MR MILLETT: No, not at all.
3	SIR MARTIN MOORE-BICK: But you can come back to it with
4	a fresh eye tomorrow.
5	MR MILLETT: Yes, thank you very much.
6	SIR MARTIN MOORE-BICK: 10 o'clock tomorrow, then, please.
7	Thank you.
8	(4.32 pm)
9	(The hearing adjourned until 10 am
10	on Wednesday, 8 September 2021)
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	
21	
22	
23	
24	
25	

1	INDEX
2	DR BARBARA LANE (sworn)1
3	Questions from COUNSEL TO THE INQUIRY1
4	
5	
6	
7	
8	
° 9	
9 10	
11	
12	
13	
13 14	
15	
16	
17	
18	
19	
20	
21	
22	
23	
24	
25	

102

abided (1) 5:18 ability (1) 31:5 able (17) 1:6 12:23 16:11 31:7 47:23 55:9 56:1,11,16 64:9 69:5,16 71:6 87:17 91:15 92:16 97:11 absence (1) 90:16 absolutely (11) 17:22 18:6 31:6 48:12 52:8 56:22 57:18,22 65:16 73:19 82:11 absorbed (1) 42:23 abut (1) 49:15 abuts (6) 46:9,13 48:1,10 62.23 63.12 accept (3) 85:23 87:21 89:20 acceptance (2) 92:5 99:17 accepted (1) 75:15 access (1) 65:18 accidentally (1) 29:9 accommodation (5) 39:6 40:23 41:6,14 42:4 account (2) 81:4 93:1 accurate (1) 65:19 acp (1) 17:21 across (2) 14:17 25:22 action (22) 15:16 26:19 37:8 83:11,23 84:1,1,5,21 87:12,13 88:7 90:21 91:23 93:1,24 94:14,21 95:9,15,18,23 actions (16) 73:1 79:18.22 83:8.19 84:11.11.24 85:16 86:6,15 87:1 88:2 91:23 98:19,21 active (4) 15:19 82:1,5 85:12 activities (1) 8:6 activity (3) 14:21 15:1 80:19 actually (21) 10:8 16:5 23:4 29:8.9 37:22 38:17 53:2 57:1 58:14 60:14 62:16 67:5,13 74:8 75:11 78:25 83:4 85:2 87:5 91:8 adapt (1) 37:23 adb (1) 48:17 add (1) 20:6 adding (1) 92:7 addition (1) 27:19 additional (3) 10:4 26:16.18 address (3) 72:2 73:1 77:24 addressed (3) 5:10,21 70:10 adequacy (2) 3:24 26:12 adequate (5) 3:17 20:10 62:4 69:19 79:3 adequately (2) 64:25 78:15 adjourned (1) 101:9 adults (1) 4:19 advice (7) 3:25 14:10 21:12 40:22 42:3 68:19 99:13 advise (4) 65:22 76:12 99:18.23 adviser (1) 32:20 advising (2) 9:6 86:15 afforded (1) 46:18 afraid (1) 24:17 after (13) 12:5 38:3 42:20 45:17 55:6,8,9,11 73:25 80:17 81:14,22 82:25 afternoon (6) 1:3,23,23,24 2:9 100:22 again (14) 1:25 15:20 18:17 22:21 24:2 27:23 43:5 62:23 66:3 86:12 90:15,20 92:14 94:16 against (1) 54:11 ago (3) 12:1 47:10 91:2 agree (25) 16:7 20:25 22:10.22 23:5.10 26:8 27:23 28:18.21 34:24 37:13.19 49:8 55:4 70:23 78:21 79:2,17 85:9 94:22 95:7 98:17 99:11,12 agreed (2) 84:22 93:18 agreement (1) 99:25

aim (1) 78:12 aiming (2) 88:22 89:17 alarm (1) 24:4 allocate (1) 94:20 allow (1) 50:10 allowed (2) 6:3 32:6 already (2) 15:21 60:20 also (20) 2:7 5:8,12 8:24 10:13 11:12,15 12:10 31:8 40:23 48:2 59:11 62:1 67:5 79:16 81:22 91:10 92:12 94:3.9 alterations (1) 3:14 although (1) 78:25 altogether (1) 18:2 always (9) 21:10 22:5 48:6,22 49:1,3 57:16 78:25 95:6 amendments (1) 5:3 analysed (1) 56:7 analysis (2) 14:20 16:12 analytical (1) 88:9 andor (1) 63:11 annex (2) 37:14,14 annual (1) 78:11 annually (2) 78:19 79:18 another (6) 6:21 12:13 32:16 70.25 81.19 93.23 answer (15) 11:3 13:9 29:14,24 44:8 46:22 53:22 63:3,17 73:7 74:4,13,15 91:1 97:18 answered (1) 28:16 answering (1) 10:24 wers (1) 36:3 anybody (2) 60:21,22 anymore (1) 60:22 anyone (1) 33:22 anything (9) 17:21 19:25 24:16 26:21 30:13 35:5,19,20 36:25 anyway (4) 51:25 52:1 82:4 94:23 anywhere (2) 28:15 57:3 apart (1) 5:3 apparently (1) 87:4 appear (2) 89:23 98:1 appended (2) 6:19 7:4 appendix (3) 6:19 66:4,5 application (1) 2:21 applied (6) 35:17 41:8 56:20 61:18.23 63:24 applies (2) 34:24 42:6 apply (3) 35:4,6 36:6 applying (1) 49:10 appoint (1) 28:4 appointed (1) 75:17 approach (6) 54:2 70:4,23 87:16,17 88:9 appropriate (5) 35:8 36:15 40:25 42:8.15 appropriately (1) 24:8 approval (1) 11:13 approve (1) 12:25 approved (3) 64:13 67:17 68.23 approver (1) 11:25 approving (2) 11:19 13:6 appurtenant (2) 57:11 58:12 april (8) 6:14 7:5.18 9:17 70:3,7 79:8 82:16 architect (1) 14:13 areas (3) 24:2 54:19 56:21 arent (1) 75:20 argument (1) 29:22 arguments (1) 99:15 arises (1) 88:11 arising (1) 73:7 around (3) 22:19 29:22 36:4 arrangements (10) 3:2,5 24:13 77:24 78:14 89:1,4,6,12 91:17 article (13) 20:25 22:13,14 23:8.10 27:23 28:11.21 41:9 58:3 59:25 77:12 78:16

articles (1) 22:19 arup (24) 6:24 7:10,14,22 8:14,14,21 9:2,4,16,17,19 10:3.9.12 11:12 15.21 12:1.20 14:3.3 16:12 35:25 asbestostype (1) 51:25 ascertain (1) 65:21 ask (17) 1:14 2:6 6:3 7:3 22:21 28:14 30:5 34:24 38:21 40:16 70:3 74:20 76:11 77:10 80:12 83:10 97:25 asked (4) 44:12 54:7 73:24 74:2 asking (13) 6:9 23:6 25:2 28:12 35:23 43:3 46:5 72:5 74:4,22 82:8,10 87:14 asks (1) 59:2 aspect (1) 27:9 aspects (1) 5:3 assess (3) 30:4 62:7 88:24 assessed (4) 58:9 63:8 78:10 88:8 assessing (8) 9:24 10:1 25:14 36:25 43:19 61:16 64:23 71:10 ent (81) 8:5,19,20 10.19 14.21 15.17 18.11 20:8,15,23 21:2 22:1,10,22 25:13 26:9 27:25 28:8,22 29:6.13.19.23 31:22 32:1.5 33:3.4.23 34:3.9 35:9.14 39:5,14 41:5 44:18,23 46:1 47:23 50:19,23 57:8 59.2 15 24 63.19 64.9 70:18 73:17.20 74:1.24 75:3,19 76:2,8,13 77:6 79:10,12,15 80:2,20,24 81:4.11.20 82:16 83:18.24 84:6,25 85:6,6 87:23 88:9,23 89:18 91:8 94:25 ments (31) 6:25 8:3,11,18 9:25 10:1 11:11.14 13:8 15:13.15.22 18:5.9.18 19:10.19.21 20:17 28:12 32:10 34:25 37:10 38:23 59:8 63:22 77:13,25 78:1 85:10 98:20 assessor (59) 3:25 20:2,13 22:7 23:7 27:5 28:3 33:11,25 34:14 37:13 38:1.4.11 39:1 40:5 42:19.25 43:19 44:2.11.21 47:10 49:22 52:23 53:25 62:15 63:11,19 64:1,7 65:10 66:9 67:2 68:22 69:8,15,25 72:3 73:12 74:17,23 75:16,17 76:6,11,17 84:9 85:4 88:22,22 89:17 90:7 91:2 92:25 97:2 99:2.13 100:4 assessors (9) 19:18 27:22 55:16 63:20 69:25 70:22 71:10 72:1 97:5 assigned (1) 48:22 assigning (1) 86:18 assist (4) 2:1 37:1 55:9,12 assistance (1) 62:2 assistant (3) 70:7.16.24 assistants (1) 41:13 associated (2) 95:8,12 associates (1) 4:1 assume (5) 29:4 31:5 64:12 76:14.16 assurance (2) 8:24 12:22 attendant (1) 49:21 attending (1) 1:25 attention (2) 61:16 62:8 audit (1) 77:1 august (2) 34:11 38:3 author (1) 36:18 automatically (1) 20:5 availability (1) 93:11 available (10) 17:3 19:20 30:19 41:4 43:6 64:21

65:24 70:21 75:25 94:12

avoid (1) 31:23 aware (15) 14:2,5 18:20 35:3,13 36:4,11 38:18 54:25 71:20 78:24 97:19.21.21 98:4 away (1) 63:1 b (4) 37:14 64:13 67:17 68:23 b4 (2) 48:16,16 back (15) 1:4 37:21 41:10 43:5 60:19 63:6.14 66:2 67:10 77:8 83:14 86:23 90:7 92:14 101:3 backtracking (1) 88:10 balance (2) 57:25 64:21 balanced (1) 95:1 band (1) 97:5 barbara (3) 1:12,16 102:2 barriers (2) 62:1,4 based (5) 6:5 7:16 15:18 81:2 98:10 basic (4) 24:21 64:18 67:24 77:4 basically (1) 86:19 basis (11) 42:22 63:17 71:8 74:24 75:3 76:8 77:11 78:11.12.24 97:3 bear (1) 2:19 bearing (3) 26:5 31:4,6 became (2) 11:25 54:19 become (3) 11:24 53:1,17 becomes (1) 48:11 becoming (1) 72:12 before (17) 6:21 7:3 15:23 21:19 51:2 55:6 57:6 59:22 60:16 63:17,20 67:5 73:25 74:9 75:24 76:23 97:5 beginning (1) 25:1 behalf (4) 22:11,23 33:24 39:1 being (25) 10:9 12:23 13:7 21:19 27:11 31:7 36:20 44:12 50:13 54:7 57:4 59:19 60:2 71:3 78:10 79:19,22,22 83:24 89:4,12 91:17 92:19 98:4,10 belief (1) 5:6 believe (1) 74:13 below (4) 14:19 44:1,10 78:13 benchmark (1) 37:9 beneficial (1) 100:6 benefit (1) 89:2 best (6) 5:6 17:19 32:10 54:4 55:15 78:18 better (2) 19:1 91:4 between (7) 32:25 51:8 79:15 84:4,13 97:13 100:3 beyond (6) 12:7 22:8 27:2 52:17 71:20 76:1 big (1) 33:8 bit (17) 25:15 26:23 28:14 32:13 36:20 39:25 43:17 46:21 56:6 11 17 66:2 7 87:2 94:1.16 96:2 bits (1) 36:5 blar00000016 (1) 6:18 blar00000016 (2) 6:20 7:7 blar000000165 (1) 7:9 blarp20000023 (1) 2:20 blarp200000235 (1) 54:13 blarp2000002368 (1) 41:11 blarp2000002376 (1) 54:24 blarp200000238 (1) 19:4 blarp20000024 (1) 2:25 blarp20000027 (1) 3:24 blarp20000027139 (1) 77:22 blarp20000027140 (1) 78:5 blarp20000027184 (1) 83:15 blarp20000027206 (1) 86:3 blarp20000027425 (1) 80:13 blarp20000027427 (1) 81:7 blarp2000002760 (1) 37:5 blarp20000028 (1) 4:3

blarp20000029 (1) 3:5 blarp20000030 (1) 3:8 blarp20000031 (1) 3:12 blarp20000032 (1) 4:7 blarp2000033 (1) 3:20 blarp20000034 (1) 3:16 blarp20000040 (1) 4:11 blarp200000405 (1) 45:10 blarp200000406 (1) 45:18 blarp200000407 (1) 40:19 blarp20000041 (2) 6:23 9:9 blarp200000414 (1) 11:4 blarp200000416 (1) 9:13 blarp200000417 (1) 15:6 blarp200000419 (1) 16:15 block (4) 16:21 17:24 18:12 42:21 blocks (15) 16:18 18:10 39:24 40:21.25 41:9 42:7.12.16.56:21 61:14,16,23 62:8 98:13 board (1) 9:4 body (8) 54:25 55:5,6,10,14,14 57:6 84:5 boroughs (1) 70:8 both (8) 8:20 12:13 14:18 28:16 33:17 42:13 55:7 56.18 bottom (1) 68:5 bound (1) 34:23 boundaries (2) 66:21 68:7 box (1) 50:6 break (8) 2:7,8 59:22 60:15,16,18 61:3 62:18 breaking (1) 52:18 breaks (1) 52:7 brief (1) 72:7 bring (2) 63:6 92:6 bringing (1) 85:10 british (5) 38:13 40:7,7,9 44:5 broad (1) 90:24 broken (2) 2:15 30:24 brought (1) 33:18 budget (1) 93:11 building (66) 3:13 14:11 15:18 17:15 24:3 25:12,14,16,19,22 26:2 27:10,11,12 29:16,16 30:16,21,23 31:2 32:14 33:10 35:18 18 40:10 43:19 45:20 46:8.9.16.17 47:1.6.11.15.21 48:21 53:14 57:2,20 59:16 60:5 63:21 65:2,15,20 66:18 67:4,6 69:8,11 72:18,23 77:2,5 81:22 84:23 85:12,22 87:3 89:9,11 90:25 93:21,23 97:9 buildings (36) 2:22 13:16 14:9 15:10.23.24 16:4 17:4.12 18:19.20.22 19:11 25:22 34:25 35:15 36:6,14,16 46:14,24 48:24 49:3,4,6 53:14 54:8 57:25 62:22 70:9 72:10 74:12 78:18 79:2 89:5 91:3 buildingspecific (1) 25:20 builds (2) 40:22 42:3 built (5) 16:18.21 18:12.13 41:8 business (3) 10:15 35:14 36:4 c (1) 94:2 calculated (1) 15:4 call (6) 3:3 33:12 39:4 44:22 53:6 54:12 called (1) 54:20 calls (1) 30:22 came (4) 9:18 21:19 35:15 97:17 cannot (2) 65:21 99:20

97:18 99:25 capable (1) 31:3 capacity (4) 49:19 66:12 67:7,15 capturing (1) 80:21 career (1) 11:11 careful (4) 44:17,18 64:24 95.4 carl (6) 3:25 74:8,18 81:13 82:24 91:3 carried (13) 14:25 15:22 18:9,11,17 27:25 28:19 31:22 32:5 74:9 80:21 93:16 98:4 carry (18) 8:11 10:18 27:22 29:5 31:25 44:7,9 50:1 59:8 61:5 64:9 74:1 78:12 81:3.13 85:16 92:9.13 carrying (15) 7:20 8:3 9:24 11:8 18:4 19:10,18,21 29:19 33:19 37:15 73:17 77:24 85:20 87:6 casebycase (1) 97:3 cash (1) 94:24 categorise (1) 72:21 categorised (1) 57:3 cause (8) 4:14 30:16 56:23 60:6 85:17 90:25 93:20 95:9 caused (1) 90:16 causing (2) 87:7 93:20 cavities (1) 61:22 cavity (2) 61:25 62:4 central (1) 45:13 certain (8) 10:14 22:5 23:23,24 39:19 47:15 65:17 71:18 cetera (1) 93:12 chairman (2) 1:22 61:9 chairmans (1) 53:23 change (6) 60:12 77:20 84:23 97:13.17.22 changed (2) 82:12,13 changes (2) 90:1 96:5 chapter (28) 2:17,22,25 3:6,8,12,18,20,24 4:3,7,11,16,23 5:4 18:25 37:3 38:24 40:18 41:10 45:9 54:14.22 55:23 72:10 77:23 80:14 83:13 chapters (1) 2:15 characteristics (1) 61:25 cheapest (1) 95:6 check (5) 12:25 19:24 21:22 22:4 97:17 checking (3) 11:13,19 13:6 checklist (3) 19:23 20:10 22:8 checks (2) 8:25 79:17 chief (1) 70:8 chosen (1) 94:7 chugging (1) 16:8 circumstance (1) 64:11 circumstances (2) 49:18 62:1 cladding (7) 61:18,21 62:10 64:23 65:7 67:23 75:6 clarificatory (1) 86:12 clarify (2) 16:24 49:7 classic (4) 20:14 60:11 68:18 76:2 classifications (1) 68:24 classified (1) 29:12 clause (2) 26:7 88:4 clear (20) 17:22 19:22 24:20 33:4 50:13.14 53:10 57:18.22.25 59:19 71:16 74:24 75:2 81:12 83:19 85:14 91:5 96:10,11 clearer (1) 87:2 clearly (2) 74:15 77:2 client (1) 60:3 clients (2) 14:10,18 close (1) 92:16 cant (21) 30:11,25 33:19 closed (4) 79:22 85:16 93:24 50:1 52:1 55:12.13.18 56:5

57:2 60:1.3.12 63:3 73:19

74:15 85:18 92:13 96:12

98:19 closely (1) 46:21 closer (1) 89:25 closing (2) 84:24 89:24 coast (1) 16:19 cohort (1) 48:6 colin (1) 97:19 collective (3) 46:7,19 48:4 column (1) 91:22 combination (2) 17:25 88:15 combined (1) 17:23 combustibility (1) 65:7 combustible (5) 19:11 51:6 61:21 66:25 68:15 come (14) 1:7,9,14 14:24 25:16 27:16 32:11 36:9 60:19 75:12 76:7 77:8 92:14 101:3 comes (9) 21:7,8 27:11 29:15 47:14 50:19 64:23 67:19 99:16 comfortable (2) 1:18 43:5 coming (1) 37:22 commenced (1) 9:18 comment (2) 36:17 98:1 commentary (1) 88:4 commercial (4) 8:23 35:4,18 36.14 commissioner (3) 70:7,16,24 common (20) 42:13 54:12,18,20 55:1 56:21,21 58:6.12.24 59:2.9.12 62:20,22 63:12 78:25 79:15,16 98:15 commonly (3) 54:4 78:17 83:5 communicate (2) 12:6 86:8 company (1) 10:13 comparison (1) 38:15 compartment (5) 18:1 49:9 50:2 52:13 63:12 compartmentation (14) 23:2,11 46:9,13,16 47:3,25 48:9 49:17.24 50:1.5.9 52:4 compartments (2) 49:15 52:21 competence (13) 27:21,22 28:22 29:5,11,12,14,17 32:16 33:2,3 38:17 44:10 competency (9) 31:13,14 34:4.9.13.15.17.19 66:3 competent (20) 8:15 16:9 28:7,10,20 29:22 31:22 32:3,12,20,22 33:25 40:4 44:2 68:22 69:15 76:16 88:21,23 89:18 competently (1) 32:5 complete (4) 5:9 75:18 80:20 84:1 completed (1) 79:19 completion (4) 81:1,15,23 82:25 complex (5) 13:7 17:6 53:15 92:24 93:5 complexity (4) 16:7 93:5,7,8 compliance (2) 44:25 78:15 compliant (1) 64:13 complied (1) 5:14 complies (1) 69:3 comply (1) 9:7 component (3) 49:9 64:18 67:24 components (1) 65:7 composed (1) 51:12 comprehensive (1) 37:8 concern (1) 71:18 concerned (1) 35:8 concerns (2) 17:23 71:20 conclude (1) 29:23 conclusion (1) 76:7 conclusions (1) 4:11 concrete (1) 51:5 condition (2) 14:11 81:22 conduct (2) 38:22 76:17

conducting (1) 42:19

confirm (7) 5:8,12 12:3 16:11.13 72:17 74:7 connect (1) 86:5 connection (2) 84:4 86:8 consequence (3) 86:6.18 87:18 consequences (6) 31:1 75:1,4 86:9,14 95:1 consider (4) 27:5 41:12 54:19 70:17 consideration (3) 22:12 50:22 82:14 considered (8) 41:13 44:24,24 63:4 74:8 75:10 78:17 98:7 considering (2) 47:25 68:20 consistent (1) 90:2 consistently (1) 89:12 constitutes (1) 46:6 constraints (1) 93:6 construction (11) 4:8 13:18 14:9,9 17:1,20,22 19:12 45:25 62:12 71:4 constructions (1) 66:24 consultant (1) 31:25 consultation (1) 99:1 contained (3) 20:11 33:25 44.23 contents (1) 26:5 context (1) 5:21 continue (2) 48:2 85:16 control (12) 3:13 23:24 30:11 58:19 65:15 70:19 82:12 83:24 88:12 93:23 95.11 99.24 controlling (2) 30:8 85:12 controls (1) 91:25 controversial (1) 59:18 controversy (1) 6:2 coo (1) 9:6 cooks (1) 29:8 core (2) 4:24 66:25 corporate (3) 8:13,14 10:5 correct (22) 2:14,24 3:4.7.11.15.19 4:2,6,10,12,17,21 5:1 7:1,21 48:19 49:12 52:13 56:22 96:21 98:11 correctly (2) 46:5 53:24 cost (3) 93:6 95:12 99:16 costeffective (7) 94:5.6.12.18.23.24 95:7 couldnt (1) 62:25 council (3) 31:14 34:4,10 counsel (2) 1:21 102:3 count (1) 26:21 counted (2) 4:15,19 course (6) 5:5 25:1 32:19 61:6 62:19 70:13 covers (1) 42:12 covid (1) 1:6 create (1) 4:4 created (1) 53:3 criteria (5) 31:13 34:1,2,10 66:3 critical (2) 80:18 89:23 criticise (4) 44:20 79:23 80:5,7 criticised (1) 80:10 crosspurposes (1) 96:14 cs (1) 4:1 cst00002516 (1) 39:22 cst000030831 (1) 95:24 cst00003138 (1) 70:6 cst000031382 (1) 70:15 cst000031651 (1) 95:17 cta000000318 (1) 26:7 cta000000359 (2) 88:3 91:21 cta0000000373 (2) 66:3 67:8 cta0000000374 (2) 66:16 68:3 cta00000011108 (1) 31:12 cta00000011109 (1) 31:17 cta0000001124 (1) 78:20 cumulative (2) 85:6 87:17

cumulatively (1) 85:1 cure (1) 94:14 current (5) 6:23 7:10 9:16 26:10 37:20 curtain (1) 66:19 cv (3) 6:19 7:4 8:5 D daly (5) 70:7,16,24 71:8,13 dalys (1) 72:2 damage (2) 66:23 68:11 damaged (1) 68:13 dan (1) 70:7 date (3) 38:16 77:14 92:4 day (5) 32:13 36:9 71:22 91.9.9 dav13734 (1) 96:16 day13736 (1) 96:16 day142135610 (1) 73:23 day14213714 (1) 74:5 days (1) 1:9 daytoday (1) 97:21 dclg (3) 42:3,14,23 deadline (3) 92:20 93:2.3 deadlines (4) 92:18.18 93:4.5 deal (5) 23:8 36:11 54:20 90:12 92:24 dealing (2) 28:21 92:23 deals (1) 14:12 dealt (2) 27:14 84:16 debate (1) 29:4 decade (1) 48:21 december (6) 31:18 34:10 79:7 95:15.18 97:14 decide (1) 87:20 decision (2) 85:22 97:2 defect (1) 89:11 defects (2) 17:7 90:10 defined (3) 21:5,25 54:17 definitely (1) 21:21 definition (6) 21:14 50:3.21 51:6 58:3 62:24 definitions (1) 55:2 degree (1) 29:5 deliver (1) 59:3 demise (1) 58:15 demonstrating (1) 38:17 depending (3) 37:15 51:18 59:5 depends (5) 24:2.5 49:12 72:10 97:8 derive (1) 93:5 derived (1) 83:23 describe (3) 17:19 34:18 99:22 described (2) 48:19 64:25 describes (1) 20:14 description (3) 32:18 64:16 69:19 descriptions (1) 82:2 design (3) 14:4 48:20 64:14 designed (2) 20:9 25:3 designing (1) 64:4 despite (3) 8:13 32:2 74:22 detailed (5) 11:13 15:18 24:21 65:2.17 details (1) 6:12 detection (1) 24:4 deteriorating (1) 89:25 determine (8) 26:12,15 31:1 34:13 62:2 65:24 72:14 88.10 determining (1) 65:11 developed (1) 84:13 developments (1) 5:24 devise (1) 91:24 diagram (2) 69:3,13 didnt (9) 36:5 43:22 44:3 53:5,7 82:18 83:5 97:16,17 different (34) 2:5 18:18.21.21.20:22.26:25 28:9 32:9 35:10 38:14 40:12 43:6 44:5,5,16 45:3,4,4 47:9 53:4 56:20 64:22 68:9 73:8 77:4.7

82:14 83:7 85:3 87:10 91:13.14 92:15 95:3 differently (1) 23:9 difficult (1) 69:18 difficulties (1) 54:8 difficulty (1) 51:1 directly (1) 56:23 director (6) 7:14 8:7,21 9:1 10:3,9 disabled (2) 39:14 74:2 disagree (2) 34:24 56:4 discharge (1) 69:7 disclosed (1) 4:24 discovered (1) 99:2 discussed (1) 25:12 discussion (1) 99:8 disseminated (1) 24:8 document (30) 6:21,22 7:3 9:10 11:4 15:8 31:16 34:12 35:6.8.36:19.21.37:9.38:19 39:11,18,23 42:25 44:13,15 54:23 55:24 57:18 64:13 65:1 67:17 68:23 70:10,12 97:12 documentation (1) 86:9 documented (1) 83:5 documents (12) 34:12 38:22 40.13 43.2 6 8 44.19 57.21 71:7 75:23 81:11 96:9 does (17) 5:11 10:16,20 28:25 29:2 30:8,17 33:12 43:12 50:16 62:24 63:4 67:1 87:6 90:5 94:17,23 doesnt (12) 29:1 52:20 56:23 58.24 59.1 8 60.6 62.21 65:18 76:10.11 99:12 doing (13) 1:9 11:22 12:12 16:24 35:9 43:5 47:23 72:21 79:15 81:19 86:20 91:8 98:15 domestic (9) 54:18,20 58:4,4,7,11,16,18 59:7 done (19) 6:5 10:2 14:8 16:12 19:22 22:10.22 24:18 38:3 56:15 75:25 79:6,22 80:1,5 81:25 99:5,19,20 dont (51) 2:4 13:5 15:2 16:2,6,7 20:4,19 21:20 22:19 23:4 26:7 28:13 32:15 17 17 33:1 1 2 5 5 8 35:5.19.20 47:20 49:15 52:2 57:15 58:15.19.21 60:20,22 71:12,12,13 72:14 74:4,13 76:16 80:7 85:2,9 89:23 95:5,7 96:23,24 97:15 99:20 door (2) 89:24 90:23 doors (5) 3:10 17:6 18:1 23:2.15 double (1) 56:15 down (20) 1:17 2:15 11:7 13:14 15:4,12 19:5 34:3 36:24 41:3 42:10 45:12,17 53:12 54:16 66:7 67:22 87.5 94.2 98.23 dr (8) 1:12,14,16,24 45:7 61:5.10 102:2 drafted (1) 36:13 draw (1) 14:14 drawing (1) 65:17 drawings (2) 82:3,4 driven (1) 93:6 driving (1) 93:7 due (1) 5:4 during (4) 2:8 35:11 40:5 64:13 duties (2) 9:7 45:14 duty (10) 3:9,12,16,20 4:3 5:13,14 20:23 26:3 31:23 dutyholder (1) 32:2 dwelling (1) 57:11 dwellings (1) 15:10 dynamic (1) 84:24

Е

e (1) 37:14 earlier (5) 38:10 42:4 74:6 81:17 98:21 earliest (1) 93:18 early (1) 14:12 easiest (1) 22:3 effect (2) 80:21 88:10 effectiveness (2) 80:1,2 effects (1) 20:7 eg (2) 66:18 88:13 either (8) 9:24 35:16 36:5 37:14 51:12 90:1,16 99:11 elicit (1) 20:9 elimination (1) 88:12 else (12) 17:8 26:2,21 29:11 30:13 36:8 43:13 44:22 48:8 62:17 64:17 85:24 elsewhere (1) 28:13 nanating (2) 62:12 71:3 embedded (1) 32:12 emergency (3) 4:4,5 23:18 emerges (1) 45:13 employ (3) 31:24 32:17 33:7 employees (1) 24:10 enable (2) 65:6 78:15 end (4) 9:18 29:12,22 63:1 endlessly (2) 13:3,6 ends (2) 72:12 85:13 enforce (2) 34:13,15 engage (1) 35:25 engineer (4) 8:9,16 10:22 58:14 engineering (2) 7:15 8:22 engineers (2) 7:16 10:21 england (2) 16:18,21 enormously (2) 38:14 100:6 enough (4) 59:19 64:16 65:10 87:17 ensure (4) 79:18 80:20 92:12,12 entering (1) 92:14 entirely (1) 10:24 entitled (3) 2:12 39:13 70:9 envelope (4) 63:21 66:18 67:4.6 environment (1) 36:10 equal (1) 47:21 equally (1) 83:3 equipped (1) 25:17 equivalent (1) 13:22 error (2) 20:13 39:25 escalate (1) 65:1 escape (9) 3:10 17:2 23:18 31:5,6 39:14 66:21 68:6 88:14 escaping (2) 30:11 68:8 essentially (1) 44:21 established (1) 34:16 estimate (1) 83:18 estimator (1) 20:1 et (1) 93:12 etc (1) 66:13 evacuate (1) 50:11 evacuation (6) 26:25 30:19 46:19 53:15 60:11,12 even (5) 15:21 25:22 35:12 38:17 65:3 event (2) 53:17 82:7 ever (5) 16:12 36:2.11 71:13 74:2 every (12) 25:9,16,22 31:23 32:4,13 36:9 79:1,14 80:2.10 86:25 everybody (2) 2:18 87:14 everyone (3) 1:3 47:20 48:8 everything (8) 16:12 21:21 42:23 43:12 53:11 79:21 87:4 96:12 evidence (16) 1:11 5:16,20,25 25:8 27:17 34:23 41:4,18 46:4,5 74:6,17 77:9 81:9 82:3 evidencegathering (1) 45:6 exactly (17) 6:6 25:15 49:25 52:6 53:1 60:1.3 63:13.13 87:19,22 90:12 98:14

99:4.10.14.14 examining (1) 67:2 example (11) 15:25 28:3 40:7,11 54:25 55:21 69:2 75:8.9.14 89:16 examples (3) 89:21,22 98:18 except (1) 58:6 exchange (2) 29:7 75:22 exclude (2) 59:7.9 excluded (4) 56:13 57:8 58:4.18 excludes (1) 54:17 exclusion (1) 58:11 executive (1) 9:5 executives (1) 70:8 exercise (5) 10:14 20:10 22:7 25:4 43:8 exercising (1) 36:22 existed (2) 72:18,22 existence (1) 29:4 existing (8) 13:16 15:14 18:9 26:12 39:20 54:7 61:16 62:7 exists (2) 84:21 85:21 exit (1) 23:22 expand (1) 12:7 expansion (1) 43:17 expansive (1) 20:16 expect (17) 24:23 33:22 38:2,25 39:11 40:4 41:12 69:14 73:9,15,16 74:23 76:19.21 88:21 89:6.17 expectation (1) 12:9 expected (3) 44:11 64:6 74.20 expense (1) 93:1 expensive (1) 93:10 experience (20) 6:10,13,24 8:20 14:8,14,17 32:9 33:11 43:9 54:5,6 55:10 69:24 71:7,17,19 75:23 81:3 91:10 experienced (2) 16:8 64:8 experiencing (1) 54:8 expert (3) 5:13.23 6:4 expertise (1) 14:6 experts (1) 1:12 explain (15) 26:24,25 47:5 56:1,5 57:1 65:20 71:8 72:9 81:24 82:6,18 83:22 84:8 86:22 explained (4) 65:19 72:11 84:5 85:25 explaining (1) 49:1 explanation (4) 57:22 74:16,25 75:2 explanations (1) 57:19 exposed (1) 68:15 express (2) 26:10 42:17 expressed (2) 53:22 58:1 expressly (3) 45:22 54:17 57:3 extended (1) 96:2 extensive (6) 9:1 25:8 60:6,7 61:15,22 extent (6) 8:1,17 9:23 17:9 52:24 54:1 external (64) 4:7 17:14,17 19:12 45:14.20.25 46:6.10.12.13.14.19.24 47:6,13,24 48:10,13,22 49:2,8,16,17,22 50:2,6,17,20 51:2,19 52:24 53:4.25 54:9 55:1.3 56:12 57:7,19,23 58:8,20,23 59:9.23 60:9 61:12 14 17 62:3.9.22.23.25 63:7 64:5 65:11 66:18 67:20 68:12,19 69:3 70:9 extinguishers (1) 24:1 extraordinarily (1) 92:24 extreme (4) 18:2 29:12 32:16 95:9 extremes (1) 64:22 eye (1) 101:4

f (1) 34:3 faade (1) 71:10 faades (4) 61:14,18 62:10 63:24 facade (1) 70:21 factual (1) 5:5 fail (1) 51:19 failure (4) 84:1 86:5,8 90:17 failures (1) 90:2 fair (3) 34:6 38:9 52:22 fairly (1) 99:6 fall (2) 58:25 59:25 falling (3) 20:12 44:1,10 falls (4) 45:21 50:17 55:3 98.23 familiar (8) 18:19 19:14.15 40:6,6 58:2 73:10 76:22 far (3) 20:3 35:7 41:19 faulty (2) 17:25 18:1 features (2) 27:2,3 feel (3) 34:23 36:20 56:6 fell (2) 8:6 36:24 few (3) 1:9 18:1 95:10 fia (1) 55:24 fifth (1) 2:1 file (1) 77:3 final (3) 66:17 81:21 85:7 finalised (1) 4:24 finally (3) 4:11 40:4 80:18 financial (2) 94:15,20 find (7) 2:19 29:18 36:25 57:2 92:14 96:20.23 findings (1) 15:15 finds (1) 87:10 fine (1) 100:20 finish (2) 92:3 100:12 fire (270) 2:21 3:2,5,10,17,21,25 6:25 7:14,15 8:3.5.8.11.15.18.21.23 9:25 10:1.2.3.18.21.22 11:11,14 13:21 14:3,20,21 15:13,14,17,19,22 17:6 18:1,4,9,11 19:10,18,19,21 20:2.8.13.16.23 21:2 22:1,6,10,17,18,22,25 23:2,7,15,22 24:1.4.4.8.11.14 25:17.21 26:8.12.16.18 27:1.5.6.10.13.16.22.25 28:3,8,11,21 30:4,5,8,11,15,16,17,22,24,2 31:5,21,25 32:1,4,4,11 33:2.11.22.25 34:3.9.14.25 35:14 37:13.25 38:4.11.23.25 39:5.13.18.19.23 40:5 41:5 42:19,24 43:19 44:2,11,20 46:15,25 47:10,12,13 48:13,15,18 49:4,21,22 50:19.22 51:15 52:12,14,18,20,23,25 53:18,25 54:1 55:7,11,16 57:6.8.23 58:13 59:3.8.16.24.60:4.6.8.10 62:15 63:11,19,20,22 64:1,2,7,14,18 65:1,10,18 66:5,6,8,9,11,11,13 67:2,14,15,17,19,21,24 68:9,10,17,18,22,23 69:10.15.20.24.25 70:9.21 71:9.10 72:1.3 73:12 74:1,17,23 75:16,17,18 76:11,13,16 77:3,12,25,25 78:2 79:10.12.14 80:20.23 81:3,10 82:7,16 83:17 84:6,8 85:4,10 88:8.9.11.12.13.14.15.18.21.2 89:16.17.23.24 90:6.10.23 91:2.5 92:16.25 94:11 97:2 99:2,12 firefighting (1) 31:8 fireproof (1) 51:11

firespread (2) 61:12,15 firestopping (2) 23:2,13 firm (1) 9:1 first (20) 2:20 7:13 9:11,11 12:14 22:24 26:9 30:17 39:4,24 45:8 52:19 67:25 70:15.23 83:10 84:4 85:11 88:25 95:17 fit (2) 12:11 96:12 fittings (2) 51:12 81:5 five (1) 100:12 fivestep (1) 20:15 fix (2) 85:18.19 fixtures (1) 81:5 flame (2) 52:17 61:25 flat (3) 51:16 52:17,19 flats (21) 16:18,21 17:25 18:10.12 39:24 40:21 41:1.9 42:8.13.13.16.21 49:13 50:10 54:18 56:21 61:14,16 62:8 flip (1) 67:10 floating (1) 36:4 flow (3) 30:1 84:3 100:8 flowing (1) 37:12 focus (4) 5:22 6:1 44:13,14 focusing (2) 63:25 88:18 follow (2) 50:16 76:10 followed (1) 20:12 following (4) 37:2,25 38:12 66:14 follows (1) 53:24 force (1) 98:3 forced (1) 50:11 foreword (2) 31:17,20 forgive (5) 13:12.23 15:20 24:25 34:22 forgotten (1) 19:25 form (5) 52:11 53:16 91:5,15,15 forma (2) 20:5 26:1 formal (3) 11:25 21:14 50:3 format (1) 37:18 formed (1) 71:9 forming (3) 67:3 75:3 76:7 formulated (1) 86:17 formulating (3) 80:22 87:12 88:7 forward (1) 1:8 found (2) 41:4 73:4 four (3) 26:9 45:12 99:21 fourth (2) 11:6 26:18 fra (19) 13:1 26:21 28:19 25 37:15,16 42:19 45:5 73:13 74:9 78:8,12,24 79:18 81:14 82:25 83:7 88:1 94:4,19 frac (1) 34:3 framework (1) 13:21 fras (6) 11:19 27:22 38:3 74:10 78:18 79:5 frequencies (1) 79:11 frequency (4) 45:6 77:10 80:7,10 fresh (1) 101:4 front (2) 21:21 36:19 full (6) 15:17 79:12,14 80:2 82:9,10 fulltime (1) 10:22 fully (4) 41:14 70:21 86:1 98:17 function (5) 29:15 30:20 33:16 92:19 93:11 functional (1) 48:16 further (5) 6:22 9:10 11:3 20:20 56:18 G 2230244 (1) 87:16 gathering (1) 73:7 gave (1) 74:9

general (7) 21:11 22:18

generality (1) 34:22

83:10

42:21 59:3 60:4 80:22

fireresisting (1) 66:18

means (18) 3:9 20:5 21:10

generally (4) 34:17 54:3 69:24 78:9 generic (1) 85:5 generically (2) 42:6 85:1 genuinely (3) 85:18 91:17 95:10 get (13) 11:23 19:21 20:20 43:17 47:20,22 56:10 91:10 93:18 94:14 98:19 99:18.20 getting (2) 72:16 91:8 gist (1) 46:5 give (12) 13:9 15:3 21:12 22:11,15 39:3 43:3 44:12 74:16 89:15,20,22 given (14) 5:16,25 6:12,22 12:24 21:24 25:8 37:25 40:22 42:3 61:17 74:18,22 76.12 gives (1) 100:11 glad (1) 1:5 glass (5) 51:12 52:5,6,7,9 glazing (1) 52:14 global (1) 7:14 goes (4) 32:13,15 42:5 58:17 going (22) 1:11 2:17 5:22 6.1 20 11.3 20.3 27.16 30.3 4 33.18 39.3 45.7 8 48:2 50:7 54:12 64:12 85:19,24 94:24 95:10 gone (2) 43:5 100:13 good (9) 1:3.22.23.24 36:25 49:1 60:23 97:7 100:14 government (8) 39:5,13 41:7.8 55:22 96:6.8 97:12 grateful (2) 25:9 27:19 gravity (1) 92:21 great (2) 12:19 91:6 grenfell (33) 2:13 4:5 18:10 35:1 38:3 39:1 40:5 43:1,20 44:3,14 46:2,3 49:13 51:2 55:7 56:7 62:21 74:3 75:7 76:20 79:6 80:9.17.21 81:5.14.25 86:24 89:5 95:15 98:22 100:4 grew (1) 55:10 group (3) 9:16,19 10:12 gubbins (1) 67:23 guidance (22) 19:18 34:12:17:37:8:38:13:22 39:19 40:13.17 42:2 43:2.7.23 44:13.19 57:17,21 73:11 83:19 96:6,9 97:12 guide (33) 39:4,13 40:15,20,23,24,25 41:6,14,15,24 42:4.6.8.12.15.18.21.22 43:22.22.24 44:4.15.21 56:18.19.19 61:10 62:6.13 96:17.18 guides (3) 41:8 42:15,24 h (2) 66:4.5 h1 (1) 66:5 hadnt (1) 12:18 halfway (1) 19:5 handover (1) 80:17 happen (5) 21:7 44:3 82:21 85:15 90:15 happening (5) 53:13 79:21 89:9.24 97:8 happens (1) 47:12 happily (1) 100:14 happy (2) 16:13 61:5 hard (1) 57:1 harm (4) 84:15 85:18 93:21 95:9 havent (9) 18:15 19:24 36:8 52:11 56:11,16 60:5 80:10 97:15 having (12) 5:21 29:12 33:7 41:18 51:1 56:6 65:1,3 68:8 75:4 92:18 98:13

hazard (27) 4:8 53:1.9.17 54:9 56:24 57:2.2 58:9.19 60:9 62:12 63:8.15 65:21 71:1.3 72:14 18:22 73:3.4 83:25 85:17 86:19 90:13 92:19 hazards (9) 3:13 27:12 29:15,18 67:3 69:19 87:10 88:13 97:8 heading (7) 7:10 15:9 42:1 45:11 61:12 66:7 80:15 health (3) 20:15 21:11.16 hear (5) 1:9.11 57:12.13 91:11 heard (6) 35:21 36:8,9 41:18 50:24 54:2 hearing (2) 1:8 101:9 hearings (1) 1:4 held (1) 55:15 help (7) 20:20 29:25 42:18 50:25 85:14 96:22 97:11 helpful (9) 20:21 34:17 63:16 66:1 68:19 71:1 72:7 85:25 90:4 helps (1) 84:10 here (17) 6:5 10:9 14:5 15:24 17.20 26.6 34.2 36.9 37.22 40.19 43.11 55.5 56.7 70:24 75:14 77:23 87:7 heres (1) 60:6 hes (1) 96:22 high (13) 15:9 19:11 78:10 84:14 87:1,4 88:8 90:10 93:20,21 95:19,25 98:22 highrise (20) 2:22 15:23 16:4 33:10 34:25 35:15 36:6 46:14,24 47:14 48:21,24 49:3,3,5 57:20,24 60:4 61:23 79:2 hindsight (1) 57:17 hits (1) 49:17 hm (6) 39:5,13 40:22 41:7,8,14 holder (1) 31:23 hom00045964 (1) 40:3 hom00045964111 (1) 61:11 hom0004596414 (1) 41:25 honestly (2) 84:16,20 hope (4) 10:24 53:24 56:9 59:19 hopefully (1) 56:10 hoping (1) 60:6 hour (1) 100:13 hours (1) 13:6 housing (3) 39:18,20 42:21 hse (2) 21:12 34:18 id (4) 21:22 34:16 45:10 97:16 idea (8) 11:25 13:2,5 15:3,24 16:1 52:19 67:2 ideal (2) 64:14,19 identified (4) 8:2 73:11 74:12 84:14 identify (2) 75:17 89:18 ie (1) 88:11 ignition (1) 68:14 ignore (2) 35:6 43:12 ii (1) 88:6 iii (1) 91:21 ill (6) 6:18 18:24 45:22 48:9 89:22 94:4 im (67) 1:5 2:17 6:1,20 8:25 10:10,24,24 12:12 14:2,5 15:4 16:11.13 17:8 18:19,20 22:18 23:5 24:17 25:2 26:23 27:19 28:13 31:13 33:17 35:7.9.21.23 36.20 20 39.3 43.4 44.12 45:8 50:1.13 51:1.1.23 52:2,18 54:12 56:6,7 57:18,25 59:19 60:10 64:12 67:9,9 74:16 75:14 76:20 77:1 78:24 82:10

85:2 94:22.24 97:15.21.21 100.8 25 immediately (3) 58:22 66:22 68:11 impact (3) 30:18 31:8 84:2 impacts (2) 30:18 31:9 implement (1) 99:23 mented (4) 78:15 impler 89:4,12 91:17 implication (1) 31:23 imply (1) 47:8 importance (1) 57:24 important (16) 10:2 16:6 25:23 32:15 38:16 53:2 57:21 59:10 67:13 84:8,18 87:22,23 90:20 92:5 99:17 importantly (1) 86:8 imposed (1) 50:18 imposes (1) 20:25 improve (1) 91:25 inadequate (3) 88:11,12,13 inapplicable (1) 35:17 include (7) 10:17 22:24 23:10,17 26:3 59:10,23 included (2) 59:13,14 includes (3) 14:18 19:10 27:6 including (10) 13:18 15:15 35.12 36.1 40.11 42.14 45:5 48:16 66:11 89:5 incompetent (1) 29:10 inconsistency (1) 32:24 inconsistent (1) 98:12 incorporate (1) 63:21 increased (1) 4:19 increasingly (1) 12:9 incredibly (1) 69:18 independent (2) 15:14 36:23 indepth (1) 67:22 index (1) 102:1 indication (1) 92:20 individual (2) 97:2 98:24 individually (2) 98:7,18 individuals (1) 4:15 industry (7) 38:13 54:3 55:16 62:12 63:15 69:24 71:4 infill (2) 51:12,24 information (33) 25:24 56:9 64:2,18,20 65:6 70:20 71:1 72:2,13,13,15,17,20 73:7,13,20 74:2,18,25 75:1.2.3.4.10.18 76:3.7.12.13.22 77:5 87:17 informed (1) 87:20 inhouse (3) 62:14 63:18 73:18 inq00014732 (1) 39:17 inquiry (14) 1:4,13,21,25 2:12 5:13,13,20,25 13:3 41:19 70:13 71:8 102:3 inspect (1) 90:2 inspecting (1) 89:2 inspection (4) 15:18 65:4 76:1,2 inspections (1) 89:22 installed (1) 90:23 installing (1) 64:4 instead (1) 65:1 instructed (4) 1:12 33:14 81:13.18 instruction (1) 24:10 instructions (1) 91:4 insulating (1) 66:25 insulation (6) 66:13 67:7.15.18 71:19.21 integrity (2) 66:12 67:15 intended (3) 2:3 35:4 47:24 interactive (1) 100:2 interconnectedness (1) 49:2 interested (3) 29:7 52:24 53:25 interesting (1) 29:3 interim (1) 85:24 interlinked (1) 46:1 internal (12) 18:1 46:12.16.18 47:3 49:16.25

50:5,20 58:20 59:10,13

interrupt (1) 100:10 interrupted (2) 30:1 100:8 intervals (1) 79:7 intimately (1) 12:8 into (14) 2:15.18 6:22 20:13 21:19 58:14 63:22 65:2 67:23 81:4 85:10 92:15 93:23 96:12 introduce (1) 93:23 introduced (1) 27:12 introduction (2) 6:13 11:6 inventory (1) 91:23 invite (1) 1:6 involve (4) 8:2,18 9:24 18:4 involved (2) 8:25 12:8 irregular (1) 79:6 irregularly (1) 79:6 irrelevant (1) 76:15 isnt (11) 2:23 21:25 28:9.11 32:20 38:1 56:18 58:24 65:16 71:14 74:7 isolation (1) 41:15 issues (5) 18:2 22:6 90:24 92:17 93:5 item (1) 94:2 items (2) 44:23 98:24 its (94) 2:15.21 8:4.22.24 9:4 10.2 12.1 16 14.11 15.12 16:1,2,6 19:1,4,20 20:7,23 21:9,20,21,22 22:1 23:25 24:1 25:15.23 26:5 27:11 29:9.20 32:18 33:8.24 35:7,8,12 38:15 43:2 45:25 48:4,18,20,23,24 51:18 52.5 7 13 16 53.1 17 57:1.21 58:6 59:10,13,14,15,15,24 64:25 65:18 67:18 69:7.9.11.18 70:6,9,10,12,25 72:14 73:10 74:7 75:8 76:5,14 77:3,19 78:17 79:24 80:1 83:4 84:18 85:13,18 89:20 90:24 93:19 95:9 98:9 itself (7) 31:2 33:16.23 49:8,9 53:17 73:18 iv (1) 94:1 ive (38) 8:4 14:8 15:4,24 16:3,12 18:17 24:20,23 27:20 30:1 33:4,17 35:21.22.36:2.10.23.23 41:17.20 43:4.5 50:6 53:10.24 56:9.15 60:19 63:5 71:12,16 72:4,11 78:25 90:23 99:2,15 janice (2) 73:22 82:25 job (1) 75:21 iohnson (2) 70:11 71:9 judgement (3) 22:7 36:22 43:9 july (3) 39:24 81:1,15 jumped (1) 75:5 june (6) 15:23 19:17 35:12 79:8 81:11,17 к kctmo (8) 3:6 4:1 45:24 72:11 80:18 81:19 86:24 100:4 kctmos (6) 3:8,12,16,20 4:3 77:2 keep (2) 48:9 77:13 keeping (1) 38:15 kind (13) 32:15 35:21 47:8 50:6 51:25 57:1,16 64:22 65:3 68:13 70:1 72:9 89:19 kinds (1) 89:15 know (104) 2:9 10:21 12:21 13:5 14:4 6 12 16:2 19:23 20:4,6,16,19 21:7 22:5,7 27:14 28:13,24 30:21 31:1,7 32:15 33:18 34:6,16

35:5.19.20 36:20.21 46:13

67:6

47:14.25 48:22 49:4.17 52:7.16 53:8.12.12.16 55:21 56:4 57:16 58:2.15 59:5.11.12.18 60:7.19 62:23 63:3 68:7,14,21,25,25 69:2,4 71:6,12,13,21,24 72:3,4,21,22,25,25 73:11 75:11 76:2,18,23 77:6 79:5 82:3.12.12.21 83:4.5 84:11 85:2.14 87:2 89:8.9.25 92:12 96:7 12 23 24 97:8.15 98:22 99:15.25 knowledge (12) 5:6 10:11,17,18 39:3,12 54:5 55:10,15 57:7 63:21 66:9 known (1) 83:2 knows (1) 28:8 L lacors (4) 39:18 42:14,24 56:19 landlocked (2) 49:15 62:21 lane (8) 1:12,14,16,24 45:7 61:5.10 102:2 language (1) 43:11 large (1) 10:20 last (7) 9:3 14:16 46:22 63:17 70:15 73:7 94:16 later (6) 27:17 37:9 39:25 40:24 54:21 77:9 latest (1) 8:4 latterly (4) 11:12,18 12:4,17 laura (2) 70:11 71:9 lavout (1) 49:13 leader (1) 7:15 leading (1) 19:18 leads (1) 90:9 learning (2) 10:10,16 least (1) 54:1 leave (4) 48:6,7 59:22 97:6 left (1) 68:5 lefthand (3) 66:17 88:5 91:22 legislation (5) 13:22 21:17 28:14 30:22 31:24 legislative (1) 31:21 less (5) 29:11,17,17 35:17 99:20 let (7) 2:9 22:15 23:9 35:10 43:14.16 85:3 lets (8) 15:6 41:24 54:11.14 85:18 86:3 88:2 93:20 letter (7) 70:6,14 71:2,14,21 72:2.15 level (15) 19:25 26:10 30:14 65:17 67:20 77:4 83:18,20 84:2,15,22 85:7,23 86:19 87:9 levels (2) 84:18 90:25 Ifbs (1) 70:4 Iga (22) 39:23 40:15,20,24 41:6.15.24 42:18.21.22 43:22 44:4,7,9,15,21 56:19 61:10 62:6.13 70:25 96:18 life (2) 44:24 84:12 lifts (1) 40:11 light (3) 15:20 34:23 42:17 lighting (1) 23:18 like (21) 9:5 17:21 19:25 22:4 23:18 25:15 26:25 32:9 34:18 36:20,21 40:17 45:10 49:20 56:6 76:17 80:5 87:2 90:2 96:8 98:13 likelihood (2) 29:20 31:7 likely (6) 13:9 29:17 42:8 51:19 53:7.8 limit (2) 92:8 99:11 limits (3) 98:2,19,20 line (3) 42:2 73:24 100:13 linear (1) 32:18 list (10) 22:15 23:17 25:11,14 27:19 39:3 43:7 67:18 74:10 75:23 listed (4) 10:9 14:23 16:16

little (12) 26:23 39:25 43:17 46:21 51:1 56:6,11,17 66:2,7 67:23 94:1 living (1) 17:15 loadbearing (3) 66:12 67:7.14 lobby (2) 62:20,22 london (1) 70:8 long (6) 12:1 13:6 25:2,7 73:1 85:15 longer (6) 7:20 41:8 77:19 92:13 94:14.20 look (29) 1:8 6:20 7:25 9:14 15:6 23:3,7 26:8 37:22 40:15 43:23 45:7 54:11,14,22 59:11 61:10 64:17 66:4.6 78:13 80:12 86:3 88:5 90:14 91:21 94:1 95:14.18 looked (5) 43:5 55:23 60:5 70:12 74:19 looking (11) 8:2 23:10,13,15 29:16 30:14 56:24 62:5 69:16 90:5 94:17 loosely (1) 54:12 lot (4) 16:1.2 33:12 72:12 lots (2) 43:3 44:15 low (4) 95:20 96:1,1,5 lower (2) 66:7 94:1 Itd (5) 4:1 7:14 9:16,18,19 lump (1) 85:5 м main (5) 29:18 65:7 67:24 78:20 84:5 maintain (3) 41:19 83:20 91:25 maintaining (1) 50:9 maintenance (4) 2:12 3:21 49:23 77:6 maior (2) 65:3 74:15 majority (2) 13:19 55:16 makes (6) 16:8 28:22 38:2 47:6 58:20 94:9 making (3) 72:13 98:3 100:14 management (23) 2:12 3:1 9:5 11:14 14:20 21:9 15 16 24:13 27:1.7.8.14.17 32:11 88:15.18.24 89:16 90:10,17 91:5 92:16 manual (1) 65:3 many (9) 13:5 15:22 16:3 18:18 60:20 82:11 89:3,5 91:3 march (1) 39:15 martin (47) 1:3.17 28:25 29:3,25 30:3,7,10,13 31:4,11 36:12 50:25 51:5,8,11,15,18,22 52:2.6.9.11.15.22 53:19.21 60:16.18.23 61:5.7 97:25 98:6.9.12.15.25.99:5.8.11 100:7.16.18.21 101:3.6 material (3) 5:24 51:25 68:15 materials (9) 19:12 53:3 61:21,24 64:12 65:25 71:3,18,20 matter (4) 28:9 29:3 48:21 85:13 matters (9) 5:5,9,21,22 17:6 22:12 25:11 27:13,14 maybe (2) 29:20 36:8 mean (45) 12:5,12,17 13:25 21:13,15 23:4 26:24,24 27:2 28:5 33:17 34:15,16 37:21 47:22 48:15 49:11 55.21 56.5 14 57.15 15 21 58:2 62:24 71:12 75:5 82:8 83:25 85:2,7 87:6 91:6 92:2 93:9 94:13,18,23,25 95:4 97:4,21 98:21,25

listening (1) 25:3

39:14 46:12 48:8 59:4 65:24 68:14 69:20 76:1 80:23 88:12.14 89:3 90:20 92:3.15 meant (11) 12:12,17,19 18:14 20:12 25:16 30:23 52:16 63:20 82:21 95:5 measure (6) 46:7,20 47:7 48:4 53:16 59:15 measures (17) 3:9,22 15:19 22:17.24 23:3.7 24:22 48:25 59:4 25 80:16 82:1,19 90:1 93:17 95:11 measuring (1) 87:12 mechanism (1) 99:24 mechanistic (1) 98:1 medium (8) 73:1 85:15 93:20.21 95:20.25 96:1.5 meet (3) 33:24 50:8 91:14 meets (1) 50:5 member (1) 9:4 members (2) 1:7,23 memory (1) 21:20 mention (2) 18:24 28:22 mentioned (1) 42:4 menzies (1) 48:25 met (2) 35:22 71:13 method (2) 36:25 86:7 middle (2) 2:8 54:15 might (13) 29:3 44:22 52:25 53:5.6 54:1 56:10 58:23 77:3 93:22 98:1,25 99:18 mill (1) 69:25 millett (16) 1:20.22 31:12 37:2 53:22 60:14.17 61:8.9 62:16 100:9,11,17,25 101:2,5 mind (8) 26:5 36:14 50:22 53:10 91:6 93:3 94:25 100:18 minimum (2) 48:23 75:24 minute (2) 14:24 91:1 minutes (1) 100:12 missed (1) 24:16 missing (2) 29:20 75:2 mitigating (1) 93:17 modern (1) 69:11 module (1) 2:11 moment (6) 6:20 7:25 71:24 81:2 84:22 94:4 months (8) 95:20.21.25 96:1.2.3.3.4 moorebick (47) 1:3,17 28:25 29:3,25 30:3,7,10,13 31:4,11 36:12 50:25 51:5,8,11,15,18,22 52:2,6,9,11,15,22 53:19,21 60:16,18,23 61:5,7 97:25 98:6,9,12,15,25 99:5,8,11 100:7.16.18.21 101:3.6 more (23) 8:4.25 11:23.23 12:14,20,20 16:6,8 20:16 24:19,21 40:9,24 42:8,15 46:21 53:7,8 56:11 85:12 86.7 94.24 morning (2) 74:7 100:14 most (15) 19:20 20:20 37:7.21.22 38:12 43:7 65:19 78:18 83:17 84:12 94:5,6,11,17 move (1) 84:23 moving (1) 70:3 ms (3) 48:25 74:19 83:3 much (20) 1:17,22,24 12:14 14:8 17:19 20:16 35:2 53:21 60:24 61:7 68:21.25 81:25 87:6.7 94:24 100:7,25 101:5 multidisciplinary (1) 9:2 multiple (3) 14:17 15:9 52:20 must (5) 29:14 32:5 43:12 94:4 95:6 myself (2) 10:21 13:8

meaning (2) 12:19 64:9

Ν

recollection (1) 36:12

recommendations (1) 37:20

namely (2) 39:4 53:23 nature (4) 26:15 61:24 98:10 99:9 neatly (1) 60:15 necessarily (2) 38:12 67:22 necessary (1) 29:5 need (25) 2:7,19 21:22 25:20 26:7,15,21 32:17 33:2 37:18 53:5,15 68:21,25,25 69:2.4.10.11 75:21 76:6 82:4 84:20 87:5 93:22 needed (8) 20:8 67:21 72:16 75:18 77:3 81:22 82:25 86:22 needing (1) 33:6 needs (7) 16:11 19:22 23:3 26:24 31:24 42:21 77:5 negative (1) 56:15 never (11) 15:4 18:11 35:21.22 36:23 44:6 72:4 74:8.10 85:13 90:15 next (12) 1:9 13:9,14 28:16 34:22 39:23 42:1 45:7,18 60:15.16 73:6 nice (1) 91:11 noncombustible (1) 52:4 none (1) 57:25 nonphysical (1) 27:13 nor (2) 41:15 55:2 normal (3) 6:4 33:11,14 normally (5) 24:2 61:23 75:15 91:24 92:25 north (1) 16:22 note (2) 24:19 92:25 notes (1) 99:13 nothing (2) 44:22 72:25 notice (1) 26:3 notified (1) 92:17 noting (1) 31:8 november (5) 78:2 79:8 95:16,23 97:14 nowhere (1) 21:13 number (9) 4:14,19 10:20 16:6 70:12 72:10 74:11 84:3 100:11 numbers (1) 2:17 0 obligation (3) 32:20 33:15 69:7 obligations (2) 50:18 73:10 obliged (1) 32:3 observations (1) 89:8 obtain (1) 64:2 obviously (2) 24:19 64:20 occasion (2) 2:1 70:10 occupied (4) 13:17.18 14:9,11 occur (3) 30:8,16 81:22 occurred (1) 81:1 occurs (1) 30:3 oclock (2) 100:22 101:6 october (1) 79:8 often (1) 12:25 oh (10) 8:8 10:1 18:14 22:18 28:9,17 34:3 47:21 69:4 94:22 okay (55) 6:7,7 10:1,5 11:2,5 13:11 14:1 20:21 22:18 28:9.17 30:18 32:15 33:9.13.18 34:21 43:1.11 44:3 47:18 48:3 11 19 49:2,11,16 50:13 52:16,19,21 53:4,8,20 58:10 60:9 62:16 64:19 65:9 67:11 68:9 76:5 82:22 84:17 85:3 87:1,8,25 89:19 95:1 96:13 98:18 99:21 100.1 old (2) 82:2,3 omission (1) 56:23 omitted (2) 45:25 57:20 once (4) 48:5 68:13 80:19 81:1

oneoff (1) 90:13 ones (2) 5:23 89:8 oneself (1) 87:12 onestop (1) 44:22 ongoing (1) 85:13 openended (1) 89:20 operating (1) 9:17 operational (2) 9:16,19 opinion (28) 5:9,24 6:4,5 37:7 44:6,17 45:19 46:6 49:20 54:11.25 55:6.6.10.14.15.21.56:2 57:6 58:8 64:17 67:1 78:14 79:10,19 81:12 82:24 opinions (4) 2:1 5:16 41:20 44:16 opposed (3) 29:21 60:2 91:11 opt (1) 94:4 order (11) 2:21 13:21 26:21 28:11 45:1 47:20,22 56:10 58:17 69:5 87:14 organisation (4) 32:12,14,22 90:22 organisational (1) 91:16 organisations (1) 32:10 organising (1) 3:1 original (1) 69:9 originally (1) 51:24 others (5) 11:23 12:11,20 13:7 29:23 otherwise (2) 94:13,21 ought (4) 22:23 94:11 98:7 99:5 ourselves (1) 62:5 outbreak (3) 22:17.24 30:5 outcome (1) 87:23 outofhouse (2) 62:15 63:18 outside (7) 33:7 52:12 54:19 55:3 57:11 58:21 60:2 ove (2) 7:14 9:17 over (5) 1:9 62:17 78:4 81:6 98:21 overall (3) 17:24 30:14 50:9 overnight (1) 100:10 oversight (1) 74:15 own (14) 8:23,24 10:14,15 12:7,10,10 19:24 36:22 54:8 71:16 77:3 79:24 81:2 package (2) 48:20.25 pages (1) 81:7 panel (2) 1:23 66:24 els (3) 51:12,24 68:12 pantheon (1) 40:16 paper (1) 91:12 paperbased (1) 65:5 paragraph (28) 6:16 7:13 11:7 13:14 14:16 19:1,5 31:19 37:5 40:19 41:2,11 42:10 45:12,23 54:15,24 61:11 64:10 70:15 77:23 78:6,6,20 80:14 81:8 86:4 90:5 paragraphs (5) 40:23 41:3 42:10 45:12 83:16 parameter (1) 93:6 parameters (2) 86:17 95:7 part (24) 18:25 20:7 27:24 31:14 34:13 38:16 41:19 48:20.24 49:9 51:19 52:4.7 55:2 57:10 58:24 59:24 63:12 66:4 70:18 80:12 85:12 87:22 100:5 participants (1) 4:25 particular (14) 5:16 13:19 14:19 16:25 38:1 61:16,24 62:8 64:4 75:5,6 86:14 93:13.24 particularly (11) 8:18 9:3 14:13 20:1 26:9 57:24 61:22 63:25 67:19 76:20 77:18 parties (1) 64:3 partners (2) 7:14 9:18

parts (19) 35:3,6,16 36:15 41:20 42:13 54:12.20 55:2 56:21 58:6 7 11 12 24 59:2.9.12 71:19 pas (30) 19:7.15.17.17 20:1,5 22:4,8 25:16 26:1,5 34:1.2.10.24 35:3.16 36:5,13,23 37:7,14,20 38:5,10 88:2,4 91:20 94:2 96.7 passive (5) 15:19 66:6,8 82:1.6 nast (3) 68:8 99:22 100:13 pause (3) 1:19 60:25 100:24 pay (1) 62:8 people (33) 12:14 14:6,7,22 19:21 25:3 30:18,19 33:19 35:22,24,25 37:21,22 38.17 39.14 42.7 43.4 7 48:5.7 50:10 54:7 55:17 58:23 71:3 75:20 84:15 85:21 91:9,14 93:21 99:15 peoples (3) 16:2 71:20 98:19 percentages (1) 16:13 perception (1) 14:3 perfectly (2) 35:8 62:11 perform (2) 47:15,24 performance (17) 48:23 49:19 50:8 64:16 66:11,13 67:14,16,18,19,24 68:18,19,23 69:9,12 82:5 performing (1) 48:11 perhaps (5) 49:20 55:7 63:6 76:10 96:14 perimeter (1) 49:14 period (9) 12:24 40:5 42:20 43:20 92:10 93:16,22 94:14,20 permits (1) 88:9 person (54) 9:6 21:1,25 22:6,11,23 28:20 29:22 31:22 32:12,22 33:15,23 34:7 44:3,20 50:18 59:3,5 60:10 62:14 63:9.18 64:3.6 65:16.22 72:19 73:9 75:16 76:6,14,19,19,21,22 77:5 80:18 83:3 84:10 85:11,20 87:3 89:7 90:14,21 93:4,15 94:19 98:4 99:9,12,19 100:3 personal (1) 71:17 personally (1) 14:7 persons (11) 3:17 4:9 17:2,15 41:13 46:2,7 74:3 86:7 87:8 99:24 perspective (4) 44:25 45:24 69:17 87:15 phase (4) 2:11 6:14 7:5 70:13 phrase (2) 33:6 48:10 physical (2) 27:2.9 pick (1) 95:6 pieces (1) 51:9 place (3) 30:17 85:11 89:1 places (3) 23:23,24 41:18 plan (10) 4:5 26:19,25 84:21 87:13 88:7 90:21 91:23 95:18.23 planned (2) 89:7 93:11 planning (3) 3:1 4:4 10:7 plans (5) 15:16 37:8 83:11 87:12 95:15 please (25) 1:15,18 2:6,9 7:7 9:14 16:15 31:12 32:7 40:18 54:23 59:1,8 60:19.20 61:11 66:4 68:2 70:15 83:14 86:2 88:3 94:1 100:23 101:6 plenty (1) 99:15 pm (4) 1:2 61:2,4 101:8 points (1) 6:1 policy (2) 45:20 91:12 poor (2) 17:20,22 portfolio (2) 15:9 72:23 nortion (3) 13:15.25 22:5

pose (3) 44:24 71:2 84:14

proportion (2) 15:1,3

posed (2) 4:8 54:9 position (7) 72:17 74:18 86:24 89:1 91:2,4,6 positive (1) 20:7 possibility (1) 30:7 possible (5) 31:10 82:2 84:19 86:14 94:18 possibly (1) 53:11 potential (2) 61:15 86:6 potentially (2) 51:23 78:10 practical (5) 45:5 81:1,14,23 89:3 practicality (1) 92:22 practically (2) 84:17,19 practice (7) 8:23 54:18 72:1 75:15 78:18,25 89:8 practitioner (2) 35:5,11 precautions (8) 22:18 26:13.16.18 59:3 60:4 80:23 94:11 precise (1) 48:12 premise (1) 59:7 premises (18) 13:17,18 14:21 35:4 42:6 49:14 54:17,18,20 58:4,4,7,11,18 70:19 84:2 88:7 89:3 remisesspecific (4) 22:5 25.23 37.23 38.2 preparation (1) 73:2 prepared (2) 2:11 85:23 present (3) 42:12 58:9 61:22 presented (2) 20:5 67:3 prevalence (1) 64:20 prevalent (1) 71:17 prevent (2) 22:17,24 preventative (1) 59:4 prevention (1) 88:11 preventive (1) 80:16 previous (2) 81:10 82:16 primary (2) 41:15 80:19 principally (2) 5:22 36:13 principles (4) 5:18 20:11,11 24:21 printed (1) 39:24 prioritized (1) 91:24 priority (3) 87:1,4 98:22 private (2) 14:18 57:11 pro (2) 20:5 26:1 probability (2) 86:18 87:18 probably (7) 16:5 22:3 29:14 40:9 50:13 53:8 100:18 problem (8) 88:11 90:7.8.9.22 95:3.4 99:3 problems (1) 17:25 procedures (1) 24:8 proceed (2) 45:17 77:11 process (5) 10:17 20:15 70:18 99:1 100:2 processes (1) 10:11 produce (8) 9:2 20:8 29:9 74:24 85:5 88:23 89:17 93:13 produced (3) 11:15,21 13:1 producing (2) 29:12,23 production (1) 15:17 professional (5) 5:9 13:16,20 44:17 81:2 profiling (1) 10:14 programme (1) 84:12 progress (1) 100:15 project (4) 8:21,24,25 10:3 projects (15) 8:9,15,21,22 9:2 12:10 13:20 14:19.23.25 15:7 16:16.25 18:4 54:9 promote (4) 52:17,20,25 54:1 prompted (1) 97:13 promulgated (1) 21:16 proper (2) 12:22 64:9 properly (3) 75:21 78:14 90:18 properties (4) 68:9,10 78:10 91:14 property (2) 77:2 91:18

propose (1) 5:4 proposed (1) 94:11 prospects (1) 30:10 protecting (2) 66:20 68:6 protection (15) 3:9.17.22 15:19 23:6 24:22 46:18 47:7 50:21 52:12 66:5,6,8 82:1 88:13 protective (12) 24:22,22 46:7,20 48:4 53:16 59:4,15,25 80:16 82:18 90:1 prove (2) 56:12.16 provide (9) 3:9,16,21 38:14 61:15 64:15 69:18 73:12 83:19 provided (6) 3:25 9:10 25:18 56:9 81:10 82:15 provides (3) 3:2 37:7 71:1 providing (1) 14:10 provision (16) 10:10,11,16,17 28:18 46:15,25 48:13,18,23 49:5 57:23 62:4 66:10 67:21 69:10 provisions (8) 25:17,21 27:10 30:22 39:19 47:14 59:16 69.20 public (5) 1:7 13:3 14:18 17:3 24:2 publication (3) 19:20 41:7 42:20 publications (2) 21:11 44:16 publicly (1) 41:4 published (10) 31:13,18 34:10.11 38:22 39:6.15.20 44:12,18 puddings (1) 29:8 purely (1) 94:14 purpose (9) 12:11 16:18,21 20:24 41:8 48:5 83:17,23 92:7 purposebuilt (8) 17:24 18:10 39:23 40:21.25 42:7.12.16 purposes (4) 18:5 77:6,7,7 0 q (315) 2:3,11,15,17.25 3:5.8.12.16.20.24 4:3.7.11.13.18.22 5:2.8.12.16.20 6:6,8,12,16,18 7:2,7,13,18,20,23,25 8:6.10.12.17 9:8.23 10:6,16,23 11:1,3,6,11,17,21 12:2.4.16.24 13:4.9.12.14.25 14:15 15:3,6,12 16:1,10,14,18,21,24 17:5,10,12,17 18:4.7.9.13.16.23 19:4,9,14,17 20:2,9,18,21 21:4,7,15,19,23 22.9.15.17.20.22 23:2.5.9.13.15.17.20.22.24 24:1,4,6,8,10,13,16,18,24 25:6,9,11,25 26:4,12,15,18,21 27:4,6,8,16,19 28:3,6,8,16,18,23 32:8.19.22.24 33:9.14.21 34:5.8.20.22 35:3.10.20.23 36:3 37:5,12,18,24 38:7,9,20 39:8,10,17,22 40:3.11.14 41:23 43:10,14,16,19,22 44:1,8,20 45:2,17 46:11,21,24 47:3,5,17,19 48:12.15 49:7.20 50:4.12.14.16.24.54:11 55:9,13,19,21,25 56:4,8,14,17,25 57:5,11,14

58:2,6,8,11,23 59:17,20,22

60:2 62:19 63:2.6.11.16

recently (1) 12:17

reclad (1) 65:20

67:8.10.12 68:2.5.21 69:2,5,7,14,22,24 70:3,6 71:5.15.23 72:1.7.24 73:5.16.21 74:22 75:4,8,12,14 76:4,9,24 77:8,16,18,22 79:4,10,13,17,25 80:4,7,9,12 81:17,24 82:10.15.20.23 83:6.10.13 84:8.25 85:3.8.25 86:12.21 87:15.20.24 88:1.18.21 89:14.20 90:4 91:1.19 92:7,11,20,25 93:8,13,25 94:17 95:2,13,23 96:14,20,22,24 97:1,10,19,24 qualifications (2) 6:10,13 quality (9) 8:18,20,24 9:24 10:1 11:14 12:22 19:24 89:24 querying (1) 14:6 question (30) 2:5 6:3 10:25 11:17 13:10,12,23 15:20 20:9 22:21 27:21 34:22 36:3 44:8 45:13 53:23 54.12 60.15 16 63.3 70.3 73.25 74.6 14 86.12 88.1 89:20 93:14 94:5 97:18 questions (14) 1:21 2:3 5:21 6:9 7:4 25:2 28:16 37:12 38:21 77:10 84:3 100:12 101:1 102:3 quickly (3) 51:20 52:8,9 quite (21) 10:4,4,7 14:4,8 18:2.13 25:2 29:10 34:18 52:2 64:25 75:10,20 78:25 79:15 83:4 84:24 87:11,11 96:11 quotation (1) 19:2 quote (1) 78:2 quoted (1) 42:5 rainscreen (2) 61:17 62:9 raised (1) 83:2 range (1) 90:24 rated (1) 52:14 rather (11) 11:24 18:24 19:17 71:7 74:9 87:16 88:22 98:1.12 100:8 101:1 rationale (1) 56:1 rbk00036722 (1) 39:8 rbkc (1) 70:11 reached (2) 36:24 99:25 reaction (5) 66:13 67:15,19 68:10.18 read (13) 2:17 6:18,21 35:6 44:4.6.9 45:8 71:21 90:6 95:5,5 97:16 reader (1) 62:13 reading (3) 44:18 71:7 72:15 ready (1) 1:20 real (1) 52:11 realise (1) 59:11 reality (1) 91:11 really (24) 9:5 14:12 15:4 19:22,25 23:4,5 25:3 32:13,14 36:15 49:1 50:3 53:2 67:13 77:2 80:5 87:6,22,22 89:9 91:7,16 97:15 reason (6) 77:18 81:19,21 84:25 97:7 99:21 reasonable (7) 34:7 38:4 41:12 42:19 44:10 85:4 94:19 reasonably (12) 33:25 39:2,12 40:4,6 44:2 64:8 68:21 69:14 88:21.23 89.18 reasons (3) 90:9 94:15.21 recall (4) 17:18,19 73:25 74:4

64:6 65:8.10.14 66:1.16

recommended (1) 96:6 recommending (2) 93:2,3 record (6) 2:18 6:22 82:6 83:22,25 84:21 recording (1) 83:10 reduce (1) 83:20 refer (3) 19:6 21:10 40:13 reference (8) 6:18 19:6 41:15 66:24 67:1 78:19 94:17 96:15 references (1) 2:18 referred (4) 27:20 38:23 43:2 59:12 referring (6) 12:4,25 55:5 76:24,25 77:1 refers (1) 44:4 reflected (1) 71:22 reform (2) 2:20 13:21 refurbishment (7) 14:10 51:3 63:23 65:25 80:19 82:19 83:1 refurbishments (1) 13:17 regard (3) 9:20 42:22 79:11 regarded (2) 52:3 79:20 regarding (1) 75:6 regardless (1) 8:13 region (1) 9:4 regs (4) 46:16,17 47:1,21 regular (2) 78:9 79:11 regularly (1) 77:13 regulations (7) 21:9,15,16 25:19 30:21 47:6 49:10 regulatory (2) 2:20 13:21 relating (1) 30:4 relation (1) 8:17 relationship (1) 42:1 relatively (1) 45:4 relaxation (1) 1:5 relevance (1) 42:23 relevant (26) 4:8 6:2,12 17:2 24:12,13 29:18 35:7 38:22 40:6 43:3 46:2.7 49:22.23 68:12 70:20 73:11.13 76:13 83:24 84:15 85:21 86:7 87:7 92:4 reliable (1) 48:1 reliance (1) 19:6 reliant (4) 48:11 49:18 50:8 64:1 relied (7) 20:3 24:23 46:3 49:5 50:21 82:7 90:1 rely (9) 19:23 46:17 47:24 48:2,9 60:13 75:16 76:3 82:2 relying (1) 69:8 remains (1) 60:11 remark (1) 57:16 remedial (4) 86:15 93:1 94:13.21 remedy (4) 93:8.9 94:20 98:9 remember (3) 49:12 51:23 52:1 reminding (1) 62:5 remove (1) 56:23 repetitiveness (1) 89:10 rephrase (1) 2:5 replaced (2) 61:19 63:25 replacement (1) 70:20 replacements (1) 64:1 report (29) 2:11,23 4:16 5:5,8,17,20,23 6:14,19 7:5 18:25.25 24:20 25:1 31:15 37:3 38:24 41:17 45:9 53:11 54:14 77:9.23 78:4.20 80:13 83:13 86:2 reports (2) 5:25 25:7 represent (3) 14:24 15:2 63:8 representing (3) 35:22 76:19,21 reprinted (1) 39:25 require (2) 52:14 75:24 required (13) 3:2 26:19 33:3 38:1 62:1.2 76:23 78:9.11 82:14 83:19 86:6 95:11

	1		I	1	1	I
requirement (6) 12:9 21:1	77:6,12,25 78:1,11	54:21,22 64:10 66:17	11:11,21 13:15,19 30:1	starting (2) 72:21,22	technicians (1) 26:6	timing (7) 79:23 82:9 84:19
27:24 28:4 31:21 48:16	79:10,12,14 80:2,20,24	67:25 68:23 78:1	50:7	starts (1) 47:12	telling (1) 74:8	97:7,22,23 99:16
requirements (5) 66:12	81:3,10,20 82:16	sections (1) 52:3	single (1) 17:2	statements (2) 42:17 75:9	template (2) 37:14 38:1	tiny (1) 67:23
67:14 68:22 69:13 79:20 requires (5) 12:21 28:19	83:11,18,18,20,24 84:2,4,6,9,11,12,14,18,22,25	sector (1) 14:18 sectors (1) 14:17	sinister (1) 18:14 sir (47) 1:3,17 28:25 29:3,25	states (2) 40:20,23 stay (5) 46:3 48:5,8 50:10	tend (2) 19:23 21:12 term (5) 21:4,24 73:1 84:17	tmo (4) 39:1 74:11 79:18 86:14
44:17 50:22 77:12	85:4,5,6,7,10,12,15,21,21,23	see (45) 1:7 7:10 8:12 9:8,15	30:3,7,10,13 31:4,11 36:12	53:3	85:15	tmos (2) 77:24 87:15
requiring (1) 68:18	86:17,18 87:6,7,9,21,23	11:9 12:16 17:10	50:25 51:5,8,11,15,18,22	stayput (5) 45:20,21 46:8	terms (2) 36:22 81:21	today (5) 1:11 10:8 35:12
residential (22) 2:22	88:8,9,21,22,23 89:17	27:4,6,10,16 31:20 32:19	52:2,6,9,11,15,22 53:19,21	48:2 53:14	territory (1) 92:15	97:5,6
15:10,23 16:4 18:20,21	90:6,10,25 91:2,8	40:14 43:7,16 49:7,11	60:16,18,23 61:5,7 97:25	step (1) 86:23	text (1) 67:5	todd (3) 36:12 78:17 97:19
19:11 25:22 33:10 34:25	92:4,9,13,21,22,23,25	55:25 56:14 59:17,17,22	98:6,9,12,15,25 99:5,8,11	steps (2) 45:5 73:3	thank (38) 1:17,22,24 5:2	todds (3) 19:6 31:15 34:23
35:15 36:6,16 47:15 48:21,24 49:4,6 57:20,24	93:13,15 94:25 97:2,4 98:4,7,10,19,24	68:16 76:5 79:17 80:7 82:23 84:24 86:21	100:7,16,18,21 101:3,6 sit (2) 1:17 87:5	stick (2) 83:13 91:20 still (5) 8:15 44:4 78:6 80:14	6:8 8:12 10:23 11:1 14:15 21:23 22:9 26:4 31:11	together (6) 49:18 50:8 66:5 76:6 85:5 86:3
48:21,24 49:4,0 57:20,24 60:5 79:2	99:2,9,13,17 100:3	87:15.24 88:6 89:14 91:13	sites (1) 13:18	96:11	38:20 40:14 43:16 45:2,2	told (8) 15:21 43:4 71:9
residents (3) 74:11 75:7	riskbyrisk (1) 87:16	93:13 94:22	sits (1) 40:16	stock (1) 87:4	53:21 56:17 60:14,23	74:10 82:24 93:19 96:15
91:10	risks (5) 30:4,5 49:21 85:5	95:4,13,19,21,24 97:10	situation (1) 18:3	stokes (21) 3:25 4:1 38:25	61:1,7,9 65:8 66:1 69:22	97:19
resisting (2) 68:9,17	92:23	100:23	six (4) 95:21 96:1,3,3	39:11 72:11 74:1,8,18	73:5 83:6 85:25 90:4 93:25	tolerable (2) 83:21 86:25
resolve (2) 73:3 95:10	robust (1) 19:20	seeing (2) 1:8 23:5	sixsided (1) 50:6	80:15 81:9,13 82:24 83:22	100:7,23,25 101:5,7	tomorrow (3) 100:22 101:4,6
resolved (1) 97:6 respect (6) 5:23 6:24 40:21	role (12) 8:7,8,13 10:4,7,16 11:21 12:7 14:19 66:10,20	seems (2) 32:3 89:25 seen (1) 33:17	skilled (1) 65:17 skills (2) 10:11,16	86:5,13 89:2 91:3,13 95:14 96:15 98:21	thats (78) 2:14,22,24 3:4,6,11,19 4:17,21 5:1	topic (5) 20:22 45:3 73:6,8 83:7
41:9 58:19 82:22	68:6	selected (3) 14:19,23 15:7	sleep (1) 42:7	stop (1) 100:21	6:18 7:1,7,21 9:11 10:3,24	totality (2) 14:25 15:2
responsibilities (3) 9:20 12:7	roles (14) 6:24 7:11,20,21,23	selection (1) 15:1	sleeping (10) 14:22 39:4,5	stopping (1) 100:19	16:14 18:13 20:21 26:1	totally (3) 45:3,4 53:4
91:9	8:1,14,17 9:16,17,19,23	selfcheck (1) 11:24	40:22 41:5,14 42:3 43:24	strategies (1) 53:15	28:9,12,23 30:15,23 31:9	touch (1) 62:21
responsibility (2) 10:13	10:5,8	senior (3) 10:4 11:23 12:20	56:18 96:17	strategy (13) 45:21 46:3,8	32:14 33:7 34:5 36:1,10	touched (1) 53:2
12:13	roughly (1) 15:21	sense (3) 63:5 71:18 82:8	slightly (1) 96:14	48:2 50:10 53:14 60:11,12	42:5 44:13 45:6 47:8,22	towards (1) 54:15
responsible (56) 9:5,6 10:10 11:12,18,24 12:21 13:7	routes (2) 66:21 68:7 routine (1) 89:22	sensible (9) 62:11 63:14 71:2 73:3 84:21.22 87:13 90:21	smoke (2) 23:24 82:12 solution (3) 94:5,18 95:6	64:15 65:1,18 67:17 78:2 straying (1) 56:6	49:5,11,12 50:14 53:12 54:10 56:22 58:17 63:4.16	tower (30) 2:13 4:5 18:10 35:1 39:1 40:5 43:1,20
21:1,25 22:6,11,23	routinely (1) 97:1	92:19	solutions (1) 94:6	strongly (4) 65:22 70:17	66:1 67:13 68:7 72:5,7	44:14 46:2,3 51:2 55:7
33:15,23 34:7 41:12 44:20	rrfso (4) 45:15 54:17 55:4	sentence (2) 32:7 94:10	solve (1) 95:3	99:18,23	75:11,22 78:19 83:4 84:17	56:7 74:3 75:7 76:20 79:6
50:18 59:3,5 60:10 62:14	78:16	sentences (1) 70:16	somebody (1) 29:11	structural (1) 17:24	85:25 86:5,19 87:9,22	80:9,17,21 81:5,14,25
63:8,18 64:3,4,6 65:22	rro (22) 3:3 8:3 10:19 18:5	separate (3) 30:21 31:9	somehow (1) 12:3	structure (1) 17:14	90:4,12,19 92:4,17 93:9	82:22 86:24 89:5 95:15
72:18,19 73:9 75:16	20:25 21:5,19,25 22:13	68:16	someone (7) 16:11 28:6	struggling (3) 26:23 28:14	95:5 96:21 98:4,11,17,23	98:22 100:4
76:6,14,18,21 77:5 80:18 83:3 84:10 85:11,19 87:3	27:24 28:18 45:11,21 50:19 56:20 58:3,13,25	separated (1) 84:20 september (4) 1:1 77:8 79:7	29:11 33:7,12 36:8 72:5 something (20) 16:5 22:4	51:23 subject (2) 38:19 59:19	99:14,16 100:9,20 theme (1) 36:2	trade (1) 79:10 trained (1) 64:8
89:7 90:14,20 93:4,15	59:1,2 73:11 77:12	101:10	26:2 29:21 32:6 36:10,16	subparagraph (1) 45:18	themselves (2) 42:13 76:17	training (3) 24:10 69:15 70:1
94:19 98:3 99:9,12,19,24	rrofso (1) 3:3	serious (5) 17:23 24:19	49:5 53:2 62:17 63:4 75:25	substantial (5) 10:7 13:15,25	theoretical (1) 14:4	transfer (2) 10:11,17
100:3	rules (7) 18:21 48:15,19 53:3	29:10 84:12 87:11	83:4 84:16 85:24	51:13 52:17	theoretically (1) 82:2	treat (1) 36:7
rest (1) 23:17	97:7,22,23	seriousness (2) 92:21,22	90:2,16,17 97:1 100:5	sufficient (15) 21:2,4,13,24	therefore (9) 13:17 37:8 41:7	treated (1) 35:16
restrained (3) 91:24 92:1,3	run (1) 69:25	services (2) 31:24 32:3	sometimes (5) 2:4 33:17	22:2 26:22 29:1,6,13,24	42:15 54:19 58:24 69:14	trend (1) 63:15
restrictions (2) 1:6 61:23 result (2) 4:18 83:23		set (21) 4:22 5:5,17 7:21,23 8:4 9:21,23 17:12 22:12	75:20,25 86:25 somewhere (1) 97:17	53:6 65:5 69:15 73:20 80:23	70:17 72:17 theres (19) 20:4 21:14 22:4	tried (2) 59:11 72:9 triggers (1) 33:6
resulting (4) 4:4 44:23 80:22	S	25:17 26:18 41:20	soon (2) 4:24 99:6	sufficiently (2) 64:8 73:10	27:2,9,13 28:4	triple (1) 56:15
82:18	sack (1) 99:25	45:14,17 72:2 77:1	sort (2) 36:7 98:13	suggest (3) 70:19 96:9 98:6	32:11,13,16,24 34:17	trivial (2) 83:20 87:11
resume (1) 100:22	safe (2) 30:23 48:7	78:1,5,8 98:13	sorted (2) 60:3 93:19	suitable (16) 3:21	48:6,18 57:16 64:12,22	true (5) 5:6,9 49:11 56:22
retain (1) 32:3	safely (2) 76:14,16	sets (2) 5:8 6:23	sorts (3) 20:6 26:24 82:13	21:2,4,12,24 22:2 26:22	75:22 89:11	59:13
retrospectively (1) 56:12	safest (1) 65:19	setting (1) 98:2	sound (1) 57:15	29:1,5,13,24 53:6 60:11	thereto (2) 57:11 58:12	truly (1) 5:23
review (13) 4:18 15:14 25:8 33:18 36:1 37:16 65:17	safety (64) 2:21 3:2,5 7:15	severity (2) 51:18 98:10 shall (1) 3:3	source (2) 41:16 90:7 south (1) 16:18	73:19 80:23 92:9 summarise (3) 25:3 46:4	theyre (13) 10:4 25:21 34:15 38:14 50:21 68:13 75:24	truncated (1) 101:1 truth (1) 60:7
78:9,23 79:1,15 82:8 89:6	8:8,15,21 10:21,22 13:21 20:15 21:11,17 24:8,11,14	shared (1) 54:4	space (2) 49:13 85:10	49:20	85:23,23 92:17	try (5) 21:9 23:9 35:10 43:14
reviewed (2) 77:13 78:19	25:17,21 27:1,8,10,13,16	shop (1) 44:22	spaces (1) 17:3	summarised (1) 53:24	96:10,11,12	85:3
reviewing (2) 9:1 65:2	30:22 31:25 32:4	shopping (2) 22:15 25:11	spandrels (2) 51:5,9	summary (4) 44:15 81:10	theyve (1) 43:8	trying (6) 12:6 14:1 17:8
reviews (2) 8:25 77:25	39:5,13,18,19,23 41:5,13	short (5) 2:3 61:3 73:1 84:17	spans (1) 14:17	82:15,17	thing (9) 12:12 34:7 62:20	23:8 47:8,9
revision (1) 38:19 revisit (1) 4:14	46:2,15,25 47:13	85:15 shortcomings (5)	speak (1) 33:19 speaking (1) 25:15	superseded (1) 41:6 support (2) 3:9 67:1	63:1 65:19,20 93:19 99:17,18	tuesday (1) 1:1 turn (11) 2:4 20:22 27:21
righthand (3) 66:6 94:3,8	48:13,15,18,25 49:4,21	88:15,18,24 89:15,19	specialise (1) 14:3	support (2) 3.9 07.1 supported (1) 60:8	thinking (4) 51:2 62:17	29:4,21 45:19 68:2 73:6
rise (4) 15:9 19:11 90:25	57:23 58:13 59:16 64:2,15,18 66:11 67:21	should (47) 16:5 22:11 23:7	specialist (9) 28:1,2,3,5	supports (1) 60:9	76:20 98:24	83:7 88:1 90:13
100:11	69:10,20 71:10 77:3 78:2	24:25 25:12 26:9 27:25	31:25 32:4,17 33:6,12	suppose (1) 29:21	thinks (1) 36:19	turning (1) 45:3
rises (1) 68:14	88:15,18,24 89:16,23	28:19 35:16 36:19 45:24	specialists (2) 28:15 62:2	supposed (2) 62:7 63:19	third (3) 26:15 39:18 54:15	type (6) 29:16 30:19 57:3
rising (1) 71:18	90:10 91:5 92:16	47:23 48:7 52:23 53:25	specific (11) 6:24 8:4 18:13	sure (10) 10:24 12:11 19:24	thorough (4) 39:2,12 81:3	59:5 64:5 90:22
risk (228) 3:25 6:25 8:3,5,11,18 9:25	salvus (2) 77:1,8	57:7 58:9 61:14,17 63:4 64:13,14,16 65:5 66:9	25:12 27:24 65:23 83:25 84:1,14 85:17 92:10	37:19 52:2 70:20 72:13 75:21 94:22 96:20	91:16 thoroughly (2) 75:10 79:23	types (9) 18:18,21 39:19 40:12 58:14 66:11 87:10
10:1,14,14,19 11:11,14	same (11) 5:17,18 17:13 25:21 41:2 54:23 59:13	67:2,18 71:10 72:4,8	specifically (1) 26:6	surface (1) 61:25	though (1) 29:10	91:13,14
13:7 14:20,21,22	73:16 80:12 94:2,9	76:12,17 77:13 79:1 81:13	spelt (1) 86:13	surfaces (2) 62:3 65:12	thought (8) 35:2 36:23	U
15:13,14,17,22	sandwich (2) 66:24 68:12	82:24 83:2,3 84:4 86:13,15	spend (1) 94:25	surprised (2) 57:12,13	51:24 78:22 79:1 81:19	U
18:4,9,11,18	sat (1) 15:4	90:7 91:15 93:15,16 94:14	spent (2) 13:15,20	suspect (1) 77:18	97:15 98:25	uk (2) 7:16 10:12
19:10,18,19,21,25 20:2,8,13,15,16,23 21:2	satisfactory (2) 62:3 65:12	100:2 shouldnt (1) 84:25	spirit (1) 64:21 splits (1) 58:14	sworn (2) 1:16 102:2 sympathy (1) 76:18	thousands (1) 33:19 three (9) 58:14 85:19 93:19	unable (1) 60:10
22:1,6,10,22 23:7 26:8,10	satisfied (1) 37:20 satisfying (1) 79:20	show (8) 19:1 37:2	splitting (2) 87:9 90:19	system (15) 3:1,21 4:4 11:14	95:20,21,25,25 96:3,3	unacceptably (2) 88:8 90:9 uncomfortable (1) 35:21
27:5,6,22,25 28:3,8,11,21	save (1) 58:11	45:8,10,22 73:22 77:22	spoken (1) 72:4	12:23 14:20 27:1 61:18	threeyear (1) 93:22	underneath (1) 9:21
29:6,13,19,23 31:22	saying (8) 24:25 47:9,21	94:4	spot (1) 79:17	62:10 80:5 82:12 90:11,17	threeyearly (2) 78:23,24	understand (43) 6:2 12:16
32:1,5,10,11	50:1 52:18 63:7 86:13 91:1	showed (1) 67:5	spread (9) 30:17 31:1	92:16 98:23	through (4) 25:14 64:3 65:23	14:7 21:10 23:4 25:6,20,23
33:3,4,11,22,25	scenario (2) 30:15 65:2	showing (1) 31:13	52:17,20 60:6,8,10 61:25	systems (8) 24:4 32:11	84:23	31:9 32:18 33:1,2,5,5
34:3,9,14,25 35:9,14 36:25 37:13,25 38:4,11,11,23,25	scenarios (3) 30:25 31:3,10	shown (2) 41:17,21 shows (1) 81:9	70:10 spreading (1) 30:24	40:10,12 81:4 82:6 88:14 89:23	thus (1) 41:19 time (24) 12:1 13:16,20	42:18 43:11,16 46:21
39:5,13 40:5 41:5 42:19,24	scheduled (1) 2:8 schemes (2) 70:21 71:11	side (6) 30:16 66:6,17 88:5	square (2) 58:8 62:25		35:9,11 71:7,24 72:1,20	47:11 53:11,19 57:15,17 58:18,19,21 59:7,20 65:6
43:19 44:2,11,20,23,24	scope (14) 8:6 23:5,6 42:14	94:3,8	stability (1) 17:24	T	80:6 81:2,20 87:5 89:25	69:9,11,16 72:22 81:20
46:1 47:10,23 49:22	45:4,14,21 50:17 55:3 57:8	sign (1) 38:15	staff (3) 11:15,21 13:1	tackle (1) 36:2	91:24 92:1,3,8,10	82:5 84:10,18 85:20
50:19,22 52:23 53:25	58:6,21,25 59:23	signage (1) 23:22	stages (1) 14:12	taken (1) 86:16	98:2,18,20,23 99:11	87:5,18 88:25 89:4 99:20
55:16 57:8 59:1,8,15,24 61:22 62:15	screen (4) 19:5 34:5 54:16	signed (1) 65:14	stair (1) 17:2 standard (5) 17:20,23 40:7	takes (1) 60:14	timeconsuming (1) 93:10	understanding (20) 10:18
61:22 62:15 63:11,19,20,22 64:1,7,23	94:2	significance (4) 66:20,22 68:6,11	47:16 69:1	taking (6) 18:24 56:17 72:20	timed (1) 84:12 timeframe (2) 65:23 92:13	12:22 19:22 21:8 30:20
65:10 66:9 67:2,3 68:14,22	second (10) 4:23 15:12 17:12 23:2 26:12 31:19	significant (6) 15:15 38:19	standards (9) 16:3 33:24	73:3 81:4 86:14 talk (4) 56:10 60:20,22 91:8	timeframes (1) 96:9	31:2 35:13 46:4 58:13 59:20 66:10 67:21,22
69:8,15,25,25 70:18,22	39:11 42:2 70:14 94:9	77:19 83:17 85:17 86:9	38:13 40:7,9,13 44:1,5,10	talking (5) 10:8 29:8 43:1	times (2) 60:20 70:12	69:12,19 73:2 80:16 87:13
71:9 72:1,3 73:2,12,17,20	secondary (1) 36:7	signs (1) 89:11	stands (1) 5:20	78:22 91:10	timescale (4) 78:8 92:8	96:11 97:4
74:1,17,23,24	section (18) 4:23 5:4 15:12	similar (1) 13:9	start (7) 6:9 50:7 72:21	tall (1) 70:9	95:14 98:9	understood (6) 5:12 6:7 25:7
75:3,16,17,18 76:2,6,8,11,13,16	38:24 40:20,24 42:1	simple (3) 2:3 64:15,25 since (9) 4:16 5:25 9:17	75:22,24 88:2 92:3 started (2) 11:11 12:14	technical (5) 7:15 14:21	timescales (9) 88:1 95:19 96:6,13,17,18 97:1,1,13	59:1 89:7 98:2
	46:15,17,25 48:17			44:25 56:9 86:7		undertake (2) 20:23 73:14

undertaking (1) 33:22	whatevers (1) 25:18	1781 (1) 80:14
unique (1) 14:8	whats (12) 24:2 25:6 28:5	1782 (1) 80:25
university (1) 10:10	30:23 31:10 33:18 45:10	1788 (1) 81:8
unnecessary (1) 76:15 unreasonable (1) 42:24	47:11 80:1 90:21,22 97:8 whizz (1) 22:19	18 (1) 26:7 184 (2) 83:14,16
unsatisfactory (1) 88:14	whole (7) 7:21 10:12,13 48:5	<b>192 (1)</b> 88:4
unsensible (1) 72:25	63:1 85:9 99:17	1971 (2) 18:12,
until (3) 85:16 93:23 101:9	wholly (1) 35:16	1992 (1) 21:22
update (3) 81:10 82:15,17 upon (4) 49:5 50:21 82:7	whom (1) 7:16 whose (1) 55:21	1997 (2) 11:12 1999 (1) 21:21
90:1	widely (2) 70:8,11	1555 (1) 21.21 1st (1) 9:17
uptodate (3) 38:12 73:13	window (4) 51:8,9 52:3	
74:2	70:21	2
urge (1) 70:17	wise (1) 60:23	
urged (1) 70:23 urgent (2) 94:13,21	wish (1) 12:18 witness (3) 60:22 61:6	2 (3) 2:11,25 70
urgently (1) 65:23	100:20	20 (1) 81:17 200 (1) 1:2
used (14) 27:11 28:11,13	work (39) 1:7 6:5 8:15,23	2005 (2) 2:21 13
36:23 37:9 38:4 43:22	10:2 11:23	2006 (1) 39:6
58:6,12 65:25 68:12 71:4 77:3 82:4	12:8,10,11,15,20 13:5,6	2007 (1) 39:15
useful (2) 26:1 91:7	14:4,8 16:7,24 19:15,24 20:7 27:9 33:20 35:7,24,24	2008 (1) 39:20 2009 (3) 13:15
user (1) 36:21	36:1 37:1 44:7,9,13,14	2010 (6) 39:2 7
using (7) 20:4 44:21 48:9	54:3 81:25 84:13 89:10	96:16 97:14
62:7,8 65:11 75:14	90:6,7,8 93:4	2011 (6) 13:19 3
usually (1) 78:8 utilise (1) 12:23	worked (1) 16:3 working (5) 8:9 13:16 22:1	34:10 39:24 6
utilising (1) 17:3	32:9 36:10	20112017 (1) 11 2012 (13) 16:18
	workplace (4) 55:2 58:16,16	38:3,5,10 42:2
V	59:14	95:16,23 96:1
v (2) 94:3,8	workplaces (2) 59:6,6 works (4) 3:13 80:19,22	20122017 (1) 10
valid (1) 77:19	82:19	2013 (3) 54:7 7 20132014 (1) 1
varied (1) 37:18	world (2) 64:14,19	20132014 (1) 13
various (2) 9:20 17:7	worth (1) 35:12	2016 (9) 39:2 4
vastly (1) 67:22 version (5) 4:23 38:5,10,10	wouldnt (5) 20:3,12 79:23	79:8 81:1,11,1
96:7	80:5 100:18 wray (4) 73:22 74:19 82:25	2017 (7) 15:23
versus (2) 82:9 90:22	83:3	63:20 70:3,7 7 2018 (2) 6:14 7:
vigour (1) 35:17	written (5) 21:11 43:11	2021 (4) 1:1 7:1
virtue (1) 58:3 visible (2) 66:22 68:11	53:12 67:24 91:12	101:10
visit (1) 74:1	wrong (2) 20:3 90:21	206 (1) 86:2
vulnerability (1) 17:15	wrote (2) 4:16 71:13	21 (1) 31:18 2114 (1) 45:23
vulnerable (6) 3:17 4:15,20	Y	<b>2114 (1)</b> 45:23 <b>214 (1)</b> 45:12
14:22 74:11 75:7	(10) 7 40 44 05 40 0 04	228 (1) 7:15
W	year (10) 7:18 11:25 12:3,24 25:19 40:1 70:4 79:1 80:1	29 (1) 95:18
	86:25	
wall (71) 4:8 17:14,17 19:12 45:14,20,25	years (11) 9:3 39:2 79:14	3
46:6,10,12,13,14,19,24	80:3,10 85:19 93:19 95:10	3 (2) 2:11 3:6
47:6,13,24 48:1,10,13,22	99:19,21,23	<b>315 (1)</b> 40:19
49:3,8,16,17,19,22	yet (1) 81:9 youre (20) 1:20 12:24 19:14	317 (1) 41:2
50:2,2,6,9,17,20 51:19	25:10,14 28:12 29:16	320 (1) 61:2
52:12,13,24 53:4,9,13,16 54:1,9 55:3 56:12	30:3,4,13 43:3 47:23 48:1	325 (1) 78:20 335 (3) 60:19 6:
57:3,7,19,23 58:8,20,20,23	58:2 72:5 76:24 86:19 87:3	3yearly (1) 78:1
59:13,14,23 60:5,8,13	91:1,7 yourself (5) 1:18 26:6 30:5	
62:22,23 63:7 64:5	38:18 64:18	4
67:20,25 68:8,17,17,19 69:3 71:1	youve (10) 9:10,21 16:15	
walls (16) 18:1 46:18 50:20	28:16 38:23 41:17 48:19	4 (8) 3:8 11:3,6 23:8,10 59:25
51:2 55:1 59:9,10 60:9	53:1 93:18,19	40 (2) 69:3,13
62:3,18,24,25 65:12	Z	425 (1) 80:13
66:19,19 68:12		427 (1) 81:6
warning (6) 62:11 63:14 71:2 72:16 76:23 88:14	zones (1) 10:14	432 (1) 101:8
wasnt (12) 10:7 12:12,19	1	
18:14 20:9 42:18 47:8 57:9		5
64:20 74:18 82:1 97:19	1 (11) 2:22 6:14 7:5,8 18:25	5 (5) 3:12 7:8,10
way (18) 2:4,6 17:19 20:16 22:3 35:10 47:9 53:5 54:16	41:10 54:14,22 95:18 102:2,3	50 (1) 41:9
59:23 64:24 73:17 85:3,13	102.2,5 10 (6) 4:7 55:23 72:10	51 (1) 40:20
87:20 95:6 98:2,15	100:22 101:6,9	5124 (1) 41:11 53 (2) 40:24 42:
ways (5) 5:17 56:20 59:12	109 (1) 31:16	53 (2) 40:24 42: 5512 (1) 37:5
76:5 95:3	<b>11 (5)</b> 2:15 4:11 6:16 40:18	5i (1) 26:7
wednesday (1) 101:10 weeks (3) 1:10 95:20,25	45:9 1111 (1) 54:15	
welcome (2) 1:3 25:10	<b>1111 (1)</b> 54:15 <b>12 (4)</b> 48:17 68:23 96:1,4	6
went (5) 37:21 55:23 67:6	122 (1) 10:11 00:20 50:1,1 122 (2) 19:1,5	
70:8,11	14 (4) 4:23 5:4 15:23 45:18	6 (9) 3:18 4:16,2 54:22 58:3 70
west (1) 16:22	140 (1) 78:4	54:22 58:3 70 615 (1) 54:24
weve (5) 25:11 60:3 70:12 75:5 100:13	143 (1) 78:1 1434 (1) 78:6	62 (1) 54:21
whatever (4) 25:19 65:24	1454 (1) 78:0 15 (1) 83:16	
71:25 99:21	17 (1) 15:24	7

<b>B1 (1)</b> 80:14	7 (4) 1:1 3:20
82 (1) 80:25	72 (1) 61:11
88 (1) 81:8	721 (2) 61:12
(1) 26:7	722 (2) 61:20
4 (2) 83:14,16	73 (2) 67:8,12
2 (1) 88:4	74 (2) 66:16 6
71 (2) 18:12,13	76 (1) 54:23
92 (1) 21:22	79 (28) 19:15,
97 (2) 11:12 12:5	22:4,8 25:16
99 (1) 21:21	34:1,2,10,24
: (1) 9:17	36:5,13,23 3
	38:5,10 88:2
2	96:7
	792012 (2) 19
3) 2:11,25 70:13	
(1) 81:17	
0 (1) 1:2	
05 (2) 2:21 13:22	8 (7) 3:24 37:3
<b>06 (1)</b> 39:6	80:14 83:13
07 (1) 39:15	8223 (1) 77:23
	8224 (1) 78:6
08 (1) 39:20	8225 (1) 78:13
<b>09 (3)</b> 13:15 77:8 79:7	
10 (6) 39:2 79:7 95:15,18	83 (1) 7:16
96:16 97:14	
11 (6) 13:19 31:14,18	Ģ
34:10 39:24 62:6	
	9 (3) 4:3 16:15
112017 (1) 15:9	90 (2) 86:25 9
12 (13) 16:18 17:1 34:11	
38:3,5,10 42:20 43:20 79:8	91 (2) 20:25 2
95:16,23 96:17 97:14	9114 (2) 83:16
	9115 (1) 83:22
122017 (1) 16:21	93 (1) 77:12
13 (3) 54:7 71:16 78:2	9818 (1) 86:4
132014 (1) 15:13	
14 (1) 79:8	99912015 (1)
16 (9) 39:2 42:20 43:20	
79:8 81:1,11,15,17 82:16	
17 (7) 15:23 19:17 35:12	
63:20 70:3,7 71:14	
18 (2) 6:14 7:5	
21 (4) 1:1 7:18 9:17	
101:10	
<b>6 (1)</b> 86:2	
(1) 31:18	
14 (1) 45:23	
4 (1) 45:12	
B (1) 7:15	
(1) 95:18	
(1) 55.10	
(1) 55.10	
3	
3	
<b>3</b> <b>2)</b> 2:11 3:6	
<b>3</b> 2) 2:11 3:6 5 (1) 40:19	
3 2) 2:11 3:6 5 (1) 40:19 7 (1) 41:2	
3 2) 2:11 3:6 5 (1) 40:19 7 (1) 41:2	
<b>3</b> 2) 2:11 3:6 5 (1) 40:19	
3 2) 2:11 3:6 5 (1) 40:19 7 (1) 41:2 0 (1) 61:2 5 (1) 78:20	
3 2) 2:11 3:6 5 (1) 40:19 7 (1) 41:2 0 (1) 61:2 5 (1) 78:20 5 (3) 60:19 61:1,4	
3 2) 2:11 3:6 5 (1) 40:19 7 (1) 41:2 0 (1) 61:2 5 (1) 78:20	
3 2) 2:11 3:6 5 (1) 40:19 7 (1) 41:2 0 (1) 61:2 5 (1) 78:20 5 (3) 60:19 61:1,4 aarly (1) 78:12	
3 2) 2:11 3:6 5 (1) 40:19 7 (1) 41:2 0 (1) 61:2 5 (1) 78:20 5 (3) 60:19 61:1,4	
3 2) 2:11 3:6 5 (1) 40:19 7 (1) 41:2 0 (1) 61:2 5 (1) 78:20 5 (3) 60:19 61:1,4 aarly (1) 78:12	
3 2) 2:11 3:6 5 (1) 40:19 7 (1) 41:2 0 (1) 61:2 5 (1) 78:20 5 (3) 60:19 61:1,4 early (1) 78:12 4	
3 (2) 2:11 3:6 5 (1) 40:19 7 (1) 41:2 0 (1) 61:2 5 (1) 78:20 5 (3) 60:19 61:1,4 early (1) 78:12 4 (8) 3:8 11:3,6 22:13,14	
3 2) 2:11 3:6 5 (1) 40:19 7 (1) 41:2 0 (1) 61:2 5 (1) 78:20 5 (3) 60:19 61:1,4 aarly (1) 78:12 4 8) 3:8 11:3,6 22:13,14 23:8,10 59:25	
3 2) 2:11 3:6 5 (1) 40:19 7 (1) 41:2 0 (1) 61:2 5 (1) 78:20 5 (3) 60:19 61:1,4 early (1) 78:12 4 8) 3:8 11:3,6 22:13,14 23:8,10 59:25 (2) 69:3,13	
3 2) 2:11 3:6 5 (1) 40:19 7 (1) 41:2 0 (1) 61:2 5 (1) 78:20 5 (3) 60:19 61:1,4 early (1) 78:12 4 (8) 3:8 11:3,6 22:13,14 23:8,10 59:25 (2) 69:3,13 5 (1) 80:13	
3 2) 2:11 3:6 5 (1) 40:19 7 (1) 41:2 0 (1) 61:2 5 (1) 78:20 5 (3) 60:19 61:1,4 early (1) 78:12 4 (8) 3:8 11:3,6 22:13,14 23:8,10 59:25 (2) 69:3,13 5 (1) 80:13	
3 2) 2:11 3:6 5 (1) 40:19 7 (1) 41:2 0 (1) 61:2 5 (1) 78:20 5 (3) 60:19 61:1,4 early (1) 78:12 4 8) 3:8 11:3,6 22:13,14 23:8,10 59:25 (2) 69:3,13 5 (1) 80:13 7 (1) 81:6	
3 2) 2:11 3:6 5 (1) 40:19 7 (1) 41:2 0 (1) 61:2 5 (1) 78:20 5 (3) 60:19 61:1,4 early (1) 78:12 4 8) 3:8 11:3,6 22:13,14 23:8,10 59:25 (2) 69:3,13 5 (1) 80:13 7 (1) 81:6	
3 2) 2:11 3:6 5 (1) 40:19 7 (1) 41:2 0 (1) 61:2 5 (1) 78:20 5 (3) 60:19 61:1.4 sarly (1) 78:12 4 8) 3:8 11:3,6 22:13,14 23:8,10 59:25 (2) 69:3,13 5 (1) 80:13 7 (1) 81:6 2 (1) 101:8	
3 2) 2:11 3:6 5 (1) 40:19 7 (1) 41:2 0 (1) 61:2 5 (1) 78:20 5 (3) 60:19 61:1,4 early (1) 78:12 4 8) 3:8 11:3,6 22:13,14 23:8,10 59:25 (2) 69:3,13 5 (1) 80:13 7 (1) 81:6	
3 2) 2:11 3:6 5 (1) 40:19 7 (1) 41:2 0 (1) 61:2 5 (1) 78:20 5 (3) 60:19 61:1.4 sarly (1) 78:12 4 8) 3:8 11:3,6 22:13,14 23:8,10 59:25 (2) 69:3,13 5 (1) 80:13 7 (1) 81:6 2 (1) 101:8	
3 2) 2:11 3:6 5 (1) 40:19 7 (1) 41:2 0 (1) 61:2 5 (1) 78:20 5 (3) 60:19 61:1.4 sarly (1) 78:12 4 8) 3:8 11:3,6 22:13,14 23:8,10 59:25 (2) 69:3,13 5 (1) 80:13 7 (1) 81:6 2 (1) 101:8	
3 2) 2:11 3:6 5 (1) 40:19 7 (1) 41:2 0 (1) 61:2 5 (1) 78:20 5 (3) 60:19 61:1,4 saardy (1) 78:12 4 (8) 3:8 11:3,6 22:13,14 23:8,10 59:25 (2) 69:3,13 5 (1) 80:13 7 (1) 81:6 2 (1) 101:8 5 (3) 3:12 7:8,10 38:24 42:1	
3 2) 2:11 3:6 5 (1) 40:19 7 (1) 41:2 0 (1) 61:2 5 (1) 78:20 5 (3) 60:19 61:1.4 early (1) 78:12 4 8) 3:8 11:3,6 22:13,14 23:8,10 59:25 (2) 69:3,13 5 (1) 80:13 7 (1) 81:6 2 (1) 101:8 5 5) 3:12 7:8,10 38:24 42:1 (1) 41:9	
3 2) 2:11 3:6 5 (1) 40:19 7 (1) 41:2 0 (1) 61:2 5 (1) 78:20 5 (3) 60:19 61:1,4 ararly (1) 78:12 4 8) 3:8 11:3,6 22:13,14 23:8,10 59:25 (2) 69:3,13 5 (1) 80:13 7 (1) 81:6 2 (1) 101:8 5 5) 3:12 7:8,10 38:24 42:1 (1) 41:9 (1) 40:20	
3 2) 2:11 3:6 5 (1) 40:19 7 (1) 41:2 0 (1) 61:2 5 (1) 78:20 5 (3) 60:19 61:1,4 aardy (1) 78:12 4 8) 3:8 11:3,6 22:13,14 23:8,10 59:25 (2) 69:3,13 5 (1) 80:13 7 (1) 81:6 2 (1) 101:8 5 (1) 41:2 (1) 41:2 (1) 40:20 24 (1) 41:11	
3 2) 2:11 3:6 5 (1) 40:19 7 (1) 41:2 0 (1) 61:2 5 (1) 78:20 5 (3) 60:19 61:1,4 early (1) 78:12 4 (8) 3:8 11:3,6 22:13,14 23:8,10 59:25 (2) 69:3,13 5 (1) 80:13 7 (1) 81:6 2 (1) 101:8 5 5) 3:12 7:8,10 38:24 42:1 (1) 41:9 (1) 40:20 24 (1) 41:11 (2) 40:24 42:10	
3 2) 2:11 3:6 5 (1) 40:19 7 (1) 41:2 0 (1) 61:2 5 (1) 78:20 5 (3) 60:19 61:1,4 early (1) 78:12 4 (8) 3:8 11:3,6 22:13,14 23:8,10 59:25 (2) 69:3,13 5 (1) 80:13 7 (1) 81:6 2 (1) 101:8 5 5) 3:12 7:8,10 38:24 42:1 (1) 41:9 (1) 40:20 24 (1) 41:11 (2) 40:24 42:10	
3 2) 2:11 3:6 5 (1) 40:19 7 (1) 41:2 0 (1) 61:2 5 (1) 78:20 5 (3) 60:19 61:1,4 sardy (1) 78:12 4 8) 3:8 11:3,6 22:13,14 23:8,10 59:25 (2) 69:3,13 5 (1) 80:13 7 (1) 81:6 2 (1) 101:8 5 5) 3:12 7:8,10 38:24 42:1 (1) 41:9 (1) 40:20 24 (1) 41:11 (2) 40:24 42:10 12 (1) 37:5	
3 2) 2:11 3:6 5 (1) 40:19 7 (1) 41:2 0 (1) 61:2 5 (1) 78:20 5 (3) 60:19 61:1,4 sardy (1) 78:12 4 8) 3:8 11:3,6 22:13,14 23:8,10 59:25 (2) 69:3,13 5 (1) 80:13 7 (1) 81:6 2 (1) 101:8 5 5) 3:12 7:8,10 38:24 42:1 (1) 41:9 (1) 40:20 24 (1) 41:11 (2) 40:24 42:10 12 (1) 37:5	
3 2) 2:11 3:6 5 (1) 40:19 7 (1) 41:2 0 (1) 61:2 5 (1) 78:20 5 (3) 60:19 61:1,4 ardy (1) 78:12 4 8) 3:8 11:3,6 22:13,14 23:8,10 59:25 (2) 69:3,13 5 (1) 80:13 7 (1) 81:6 2 (1) 101:8 5 5) 3:12 7:8,10 38:24 42:1 (1) 41:9 (1) 40:20 24 (1) 41:11 (2) 40:24 42:10 12 (1) 37:5 (1) 26:7	
3 2) 2:11 3:6 5 (1) 40:19 7 (1) 41:2 0 (1) 61:2 5 (1) 78:20 5 (3) 60:19 61:1,4 aardy (1) 78:12 4 8) 3:8 11:3,6 22:13,14 23:8,10 59:25 (2) 69:3,13 5 (1) 80:13 7 (1) 81:6 2 (1) 101:8 5	
3 2) 2:11 3:6 5 (1) 40:19 7 (1) 41:2 0 (1) 61:2 5 (1) 78:20 5 (3) 60:19 61:1,4 ardy (1) 78:12 4 8) 3:8 11:3,6 22:13,14 23:8,10 59:25 (2) 69:3,13 5 (1) 80:13 7 (1) 81:6 2 (1) 101:8 5 5) 3:12 7:8,10 38:24 42:1 (1) 41:9 (1) 40:20 24 (1) 41:11 (2) 40:24 42:10 12 (1) 37:5 (1) 26:7	
3 2) 2:11 3:6 5 (1) 40:19 7 (1) 41:2 0 (1) 61:2 5 (1) 78:20 5 (3) 60:19 61:1,4 aardy (1) 78:12 4 8) 3:8 11:3,6 22:13,14 23:8,10 59:25 (2) 69:3,13 5 (1) 80:13 7 (1) 81:6 2 (1) 101:8 5 5) 3:12 7:8,10 38:24 42:1 (1) 41:9 (1) 40:20 24 (1) 41:11 (2) 40:24 42:10 12 (1) 37:5 (1) 26:7 6	
3 2) 2:11 3:6 5 (1) 40:19 7 (1) 41:2 0 (1) 61:2 5 (1) 78:20 5 (3) 60:19 61:1,4 early (1) 78:12 4 (8) 3:8 11:3,6 22:13,14 23:8,10 59:25 (2) 69:3,13 5 (1) 80:13 7 (1) 81:6 2 (1) 101:8 5 5) 3:12 7:8,10 38:24 42:1 (1) 41:9 (1) 40:20 24 (1) 41:11 (2) 40:24 42:10 12 (1) 37:5 (1) 26:7 6 9) 3:18 4:16,23 5:4 9:13	
3 2) 2:11 3:6 5 (1) 40:19 7 (1) 41:2 0 (1) 61:2 5 (1) 78:20 5 (3) 60:19 61:1,4 ardy (1) 78:12 4 8) 3:8 11:3,6 22:13,14 23:8,10 59:25 (2) 69:3,13 5 (1) 80:13 7 (1) 81:6 2 (1) 101:8 5 5) 3:12 7:8,10 38:24 42:1 (1) 41:9 (1) 40:20 24 (1) 41:11 (2) 40:24 42:10 12 (1) 37:5 (1) 26:7	

	(4) 1:1 3:20 15:6,8
	2 (1) 61:11 21 (2) 61:12 64:10
	2 (2) 61:22 65:11
	(2) 67:8,12
	(2) 66:16 68:2
	(1) 54:23
79	(28) 19:15,17,17 20:1,5 22:4,8 25:16 26:1,5
	22:4,8 25:10 20:1,5 34:1,2,10,24 35:3,16
	36:5,13,23 37:14,20
	38:5,10 88:2,4 91:20 94:2
70	96:7
19	2012 (2) 19:7 37:7
_	8
8	(7) 3:24 37:3 38:24 77:23
	80:14 83:13 101:10
	23 (1) 77:23
	24 (1) 78:6
	25 (1) 78:13 (1) 7:16
_	9
	<b>(3)</b> 4:3 16:15 78:16
	(2) 86:25 98:21
	(2) 20:25 27:23
	14 (2) 83:16,17 15 (1) 83:22
	(1) 77:12
	18 (1) 86:4
99	912015 (1) 40:8