

Page 1	Page 3
<p>1 Wednesday, 22 January 2020</p> <p>2 (10.00 am)</p> <p>3 MR PENNICOTT: Good morning, sir. Good morning,</p> <p>4 Prof Hansford. We're nearly there.</p> <p>5 Sir, as you're aware, originally three days were set</p> <p>6 aside for the closing submissions in this last part of</p> <p>7 the Inquiry. Having received time estimates from each</p> <p>8 of the parties who wish to say something, we believe</p> <p>9 that we can quite comfortably fit the closing</p> <p>10 submissions into two days, that is today and tomorrow,</p> <p>11 and there will therefore be no need to come here on</p> <p>12 Friday.</p> <p>13 Sir, also we have indicated to the parties the order</p> <p>14 in which the Commission would like to hear the closing</p> <p>15 submissions. Perhaps you have seen this already but</p> <p>16 I will mention it anyway so that at least those outside</p> <p>17 know what's coming. First of all, this morning will be</p> <p>18 Wing & Kwong, first of all, and then the government, and</p> <p>19 for the rest of the day will be Pypun and MTR. If we</p> <p>20 get to a stage where we can start Pypun this morning,</p> <p>21 I'm sure we won't need to wait until the afternoon,</p> <p>22 although they have been put in this afternoon.</p> <p>23 Then tomorrow will be Leighton, Atkins if they wish</p> <p>24 to say anything but they have indicated that they may</p> <p>25 not, and then of course myself on behalf of the</p>	<p>1 not have acted on a frolic of his own and try to fit</p> <p>2 a parallel threaded rebar into a tapered Lenton coupler,</p> <p>3 or indeed try to fit rebars into inaccessible couplers,</p> <p>4 those that were embedded in the concrete, because these</p> <p>5 two problems were too obvious. You will have heard me</p> <p>6 referred to them as the square peg/round hole situation</p> <p>7 and a no-hole situation, and because the lack of</p> <p>8 connection is so obvious, they must have been told by</p> <p>9 Leighton to do it that way.</p> <p>10 Question two, whether Henry Lai really conducted</p> <p>11 proper rebar fixing checks. I will take you to the</p> <p>12 facts that will show that Leighton's claim that they</p> <p>13 conducted up to 15 hours of routine inspections and two</p> <p>14 hours of rebar fixing checks and yet still did not spot</p> <p>15 a single problematic connection is simply unreal and</p> <p>16 untrue.</p> <p>17 The last question is what does the conduct of</p> <p>18 Leighton show in this case. Here I intend to go through</p> <p>19 some of the other evidence, including their failure to</p> <p>20 perform joint inspection to ensure compatibility, the</p> <p>21 failure to obtain the correct types of rebars and their</p> <p>22 attempt to conceal the truth from MTR in the face of</p> <p>23 MTR's enquiries, in order to explain Leighton's conduct.</p> <p>24 For the first question, did Ah Chun really report</p> <p>25 this to Henry Lai or did he just act on a frolic of his</p>
Page 2	Page 4
<p>1 Commission.</p> <p>2 So, sir, unless there is anything else you want to</p> <p>3 raise, I will sit down and let Mr Tsoi, on behalf of</p> <p>4 Wing & Kwong, make a start.</p> <p>5 CHAIRMAN: Yes.</p> <p>6 Closing statement by MR TSOI</p> <p>7 MR TSOI: May it please you, Chairman and Commissioner, it</p> <p>8 may be that we do need the afternoon for Pypun but</p> <p>9 anyway, I will try to press on as fast as I can.</p> <p>10 Wing & Kwong have provided lengthy written</p> <p>11 submissions to the Commission and I do not intend to</p> <p>12 read that out. However, I do intend to concentrate on</p> <p>13 some of the points that are important to Wing & Kwong's</p> <p>14 case.</p> <p>15 When opening the case for Wing & Kwong, I concluded</p> <p>16 with this remark, that Wing & Kwong should not be made</p> <p>17 Leighton's scapegoat for complying with their</p> <p>18 instructions. In closing Wing & Kwong's case, I intend</p> <p>19 to concentrate on three main questions to make good that</p> <p>20 conclusion.</p> <p>21 The first question is whether Ah Chun really</p> <p>22 reported the rebar and coupler mismatch problem to</p> <p>23 Henry Lai, and in that question I intend to take the</p> <p>24 Commission through the facts and all the evidence that</p> <p>25 shows that Wing & Kwong, in particular Ah Chun, would</p>	<p>1 own -- well, as I said previously, a good starting point</p> <p>2 would be to go through the Wing & Kwong sub-contract</p> <p>3 because that tells you the respective rights and</p> <p>4 obligations of the parties. Now, it's a lengthy</p> <p>5 agreement, I'm not going to take you through it again.</p> <p>6 You know the clauses. But to summarise, Wing & Kwong,</p> <p>7 under the sub-contract, was to provide labour only.</p> <p>8 They had to work with whatever materials they were</p> <p>9 provided, and they had to follow instructions from</p> <p>10 Leighton. They cannot communicate with MTRCL without</p> <p>11 Leighton's approval, and they can be replaced by</p> <p>12 Leighton with another sub-contractor at any time for any</p> <p>13 part of their work, without reason or compensation from</p> <p>14 Leighton.</p> <p>15 Importantly, if any of their works should fail</p> <p>16 inspection, they have to rectify that at their own</p> <p>17 expense.</p> <p>18 As I say, the agreement itself is a lengthy</p> <p>19 agreement so I'm not going to take you through it again,</p> <p>20 but I do ask you to note page EE140, which sets out the</p> <p>21 general notes of the sub-contract and it says this:</p> <p>22 "The sub-contractor [Wing & Kwong] shall complete</p> <p>23 reinforcement fixing works using [the] approved method</p> <p>24 and follow the instructions of the contractor's site</p> <p>25 team in respect of speed, extent, timing, sequencing and</p>

Page 5	<p>1 staging."</p> <p>2 So that was Wing & Kwong's job.</p> <p>3 In terms of rights and hierarchy, Leighton was</p> <p>4 clearly above them; they can tell them what to do. On</p> <p>5 the other hand, for Leighton, under this sub-contract,</p> <p>6 their job is quite simple. All they had to do was get</p> <p>7 Wing & Kwong the correct materials to work with. That's</p> <p>8 all they had to do. You can find that under the</p> <p>9 sub-contract at page EE145. I'm not going to turn that</p> <p>10 up but it's item 12(g) if you want to make a note of it.</p> <p>11 Here the contractor, Leighton, had to supply couplers</p> <p>12 and rebars with the quality control documentation and</p> <p>13 lab testing. They had to provide them at their cost.</p> <p>14 So that was Leighton's job.</p> <p>15 That obligation is obviously quite obvious, as</p> <p>16 a matter of logic, because between Leighton and Wing</p> <p>17 & Kwong, Leighton was the only party that knew in</p> <p>18 advance what types of rebars would be used and what</p> <p>19 types of couplers would be used at which location, so</p> <p>20 that obligation imposed on Leighton is quite obvious.</p> <p>21 And as MTRCL's construction engineer Chris Chan says in</p> <p>22 his evidence -- and you can find that at page BB109,</p> <p>23 paragraph 11 -- he says this:</p> <p>24 "... I wish to explain what rebars and couplers</p> <p>25 should have been used in the construction of the</p>	Page 7	<p>1 into the couplers that had already been used on the 1111</p> <p>2 side. That's also why there were a number of interface</p> <p>3 meetings, because -- there were in fact 22 of them and</p> <p>4 it's not in dispute that Wing & Kwong, being a mere</p> <p>5 sub-contractor, they did not attend the interface</p> <p>6 meetings, nor were they invited to.</p> <p>7 These interface meetings are important because, as</p> <p>8 MTR says, it is where Leighton were told time and again</p> <p>9 that Lenton couplers were used on the 1111 side of the</p> <p>10 interface.</p> <p>11 If one looks then at the Leighton organisation</p> <p>12 chart -- and you can find that -- and I will ask that to</p> <p>13 be shown on the screen -- at page C5538, and this forms</p> <p>14 part of the evidence of part 1 of the Inquiry. I'm</p> <p>15 using this evidence because it was shown to Jim Wong,</p> <p>16 the site agent for Leighton.</p> <p>17 You see that where you find Joe Tam -- I think you</p> <p>18 need to move a bit to the right -- you see the</p> <p>19 construction manager, Joe Tam, and to his left there's</p> <p>20 a branch for NAT, and then you see the senior site</p> <p>21 agent, Jim Wong, who came to testify before you.</p> <p>22 Underneath him, site agent Chan Hon Sun on the left, and</p> <p>23 two engineers right below him. One of them was</p> <p>24 Henry Lai.</p> <p>25 Now, Joe Tam, the construction manager -- and he</p>
Page 6	<p>1 3 stitch joints and the ... shunt neck joint ... in this</p> <p>2 context, I point out that Leighton should procure rebars</p> <p>3 and couplers from the manufacturers/suppliers of</p> <p>4 rebars/couplers based on the specifications stated in</p> <p>5 the working drawings. [They] ... include: (1) the size</p> <p>6 of rebars that should be used; and, (2) the locations</p> <p>7 where rebars and couplers should be installed. In</p> <p>8 addition, [at the interfaces], the materials that had to</p> <p>9 be used required coordination between contractor under</p> <p>10 contract 1111 (Gammon-Kaden) and ... contractor ... 1112</p> <p>11 (Leighton). The materials that had to be used at the</p> <p>12 ... interface had been discussed during a number of ...</p> <p>13 interface meetings, which were regularly held and which</p> <p>14 were attended by representatives of Leighton,</p> <p>15 Gammon-Kaden and MTRCL ..."</p> <p>16 That of course is also as provided for in the</p> <p>17 interfacing requirements specifications which</p> <p>18 Commissioner Hansford has referred to quite a few times.</p> <p>19 You can find that at page BB425. There you see that for</p> <p>20 Leighton, they had to perform joint inspection of the</p> <p>21 waterproofing system, of the couplers and the protective</p> <p>22 measures of the couplers.</p> <p>23 So Leighton was supposed to carry out this</p> <p>24 compatibility check, making sure that the rebars that</p> <p>25 they order to do the work at the interface would fit</p>	Page 8	<p>1 admits this at page CC84, I won't ask that to be turned</p> <p>2 up -- but he admits that "it had been discussed and</p> <p>3 approved that T40 rebar would be BOSA connected and</p> <p>4 threaded to BOSA branded couplers, whereas other rebar</p> <p>5 would be Lenton threaded and connected to Lenton branded</p> <p>6 couplers. This matter was reported to me at the time,</p> <p>7 though I did not know whether this was also passed on to</p> <p>8 other members of Leighton's construction engineering</p> <p>9 team."</p> <p>10 So that's what Joe Tam said. Joe Tam knew about it.</p> <p>11 Chan Hon Sun knew about it, and that's the name above</p> <p>12 Henry Lai because Chan Hon Sun attended the 12th and the</p> <p>13 22nd interface meetings. Jim Wong knew about it because</p> <p>14 he told us about it here; he said he attended various</p> <p>15 interface meetings and he knew about it.</p> <p>16 So although the entire chain of people above</p> <p>17 Henry Lai knew about the Lenton couplers, yet Henry Lai,</p> <p>18 who was meant to be the person who inspects the</p> <p>19 connection between the rebar and the coupler, did not</p> <p>20 know about this, he says. That's why probably, when</p> <p>21 Jim Wong came to give evidence, he was asked the obvious</p> <p>22 question by Commissioner Hansford. He was asked this:</p> <p>23 "But Henry Lai worked under you. Just look at the</p> <p>24 chart." Jim Wong couldn't even bring himself to admit</p> <p>25 that Henry Lai was one of his subordinates.</p>

Page 9	<p>1 So, as a result, Leighton did not get the correct</p> <p>2 rebars. That is not in dispute, because apparently the</p> <p>3 person who was meant to order the rebars, Henry Lai, did</p> <p>4 not know that Lenton couplers would be used at the</p> <p>5 interface, which itself is extraordinary.</p> <p>6 This then gives rise to the first problem, what we</p> <p>7 call the square peg/round hole issue. It's caused by</p> <p>8 a mismatch of the materials, Lenton couplers, parallel</p> <p>9 rebars, which should not have happened if Leighton</p> <p>10 conducted their compatibility check.</p> <p>11 It's not really in dispute that a parallel threaded</p> <p>12 rebar cannot fit into a Lenton tapered coupler. As</p> <p>13 Chris Chan says in his evidence, given their specific</p> <p>14 shapes and threading requirements, a Lenton threaded</p> <p>15 rebar cannot be screwed into a BOSA coupler and a BOSA</p> <p>16 threaded rebar cannot be screwed into a Lenton coupler.</p> <p>17 But you don't really need a rocket scientist to tell you</p> <p>18 this because if you look at the pictures provided by</p> <p>19 Wing & Kwong -- and you can find that at page EE400; can</p> <p>20 we pull that up? -- just by merely looking at the shape</p> <p>21 of the rebar and the coupler, you know they don't fit.</p> <p>22 So Henry Lai was asked this simple question: well,</p> <p>23 can they fit? He didn't even want to answer that</p> <p>24 question, and you'll remember because Chairman was hold</p> <p>25 the coupler and the rebar because Henry Lai wanted to</p>	Page 11	<p>1 the SAT, not the NAT, but the same inspection applies --</p> <p>2 and I'm quoting from Sean Wong, not Henry Lai, because</p> <p>3 Henry Lai does not provide details of how he inspected</p> <p>4 the works. But anyway, he explains this, that there are</p> <p>5 practical aspects to formal rebar fixing inspection,</p> <p>6 there are two formal joint inspections, and if you turn</p> <p>7 to page CC3804, he says this, importantly:</p> <p>8 "As noted above, for the connection between rebar</p> <p>9 and couplers, I would check that the threads of the</p> <p>10 rebar were screwed into the couplers and not exposed (or</p> <p>11 that only a few threads were exposed at most)".</p> <p>12 So if proper inspection was conducted, at most only</p> <p>13 a few threads would be exposed. You have heard evidence</p> <p>14 from the rebar fixers that if you try to fix or connect</p> <p>15 a parallel threaded rebar into a Lenton coupler, the</p> <p>16 opposite occurs, meaning only two or three threads could</p> <p>17 go in; all the other threads would be exposed. But more</p> <p>18 importantly, Sean Wong says this at page CC3802:</p> <p>19 "The formalities associated with the formal joint</p> <p>20 inspection were [these]:</p> <p>21 There were two key formal joint inspections ..."</p> <p>22 After that he says this:</p> <p>23 "The sub-contractors knew that their work would need</p> <p>24 to be inspected or rectified (if there were any defects)</p> <p>25 before they could proceed to the next phase. This was</p>
Page 10	<p>1 see a sample of a rebar and a coupler, to see if they</p> <p>2 really fit, giving the impression that he didn't really</p> <p>3 know before this.</p> <p>4 The other type of problem we have is the no-hole</p> <p>5 situation where the coupler was inaccessible because it</p> <p>6 was still in the concrete. Now, this problem is even</p> <p>7 more obvious because you've heard evidence from Ah Chun</p> <p>8 as to the cause of this, because Leighton was rushing</p> <p>9 through the works and they were asking Wing & Kwong to</p> <p>10 do the rebar fixing even when the concrete was not</p> <p>11 completely hacked off. If the coupler was still in the</p> <p>12 concrete or still covered by concrete, obviously a rebar</p> <p>13 cannot be connected correctly to the coupler.</p> <p>14 But importantly for our purposes, these two problems</p> <p>15 were visually obvious. They were either not connected</p> <p>16 at all or threads would be exposed.</p> <p>17 So given the fact that these defects were obvious,</p> <p>18 what happened to inspection? Well, after Wing & Kwong</p> <p>19 completes the rebar fixing works, it's not in dispute</p> <p>20 that hold-point inspection would take place, jointly by</p> <p>21 MTR and Leighton, and we have heard that this consists</p> <p>22 of two checks, the rebar fixing check and the pre-pour</p> <p>23 check.</p> <p>24 As explained by Leighton's engineer Sean Wong -- and</p> <p>25 you can find this at page CC3803, although he worked in</p>	Page 12	<p>1 called a 'hold point'. The 'hold points' were</p> <p>2 a critical stage in the construction process."</p> <p>3 And you will notice that every other Leighton</p> <p>4 engineer says the same thing -- Jeff Lii, senior</p> <p>5 engineer; Alan Yeung, senior engineer; Raymond Tsoi,</p> <p>6 engineer; Ronald Leung, site agent; Saky Chan, assistant</p> <p>7 engineer -- everyone says it, except Henry Lai. In</p> <p>8 fact, during Jeff Lii's evidence here, he confirmed that</p> <p>9 in carrying out the formal and informal inspections, he</p> <p>10 would not only generally look at the connection but</p> <p>11 would physically try to screw the rebars in, to make</p> <p>12 sure that it had been screwed all the way in or was</p> <p>13 tight enough, and if there were problems regarding</p> <p>14 coupler connections during inspection, for example</p> <p>15 a loose connection, he would call Ah Chun to tell him to</p> <p>16 get someone to come down and screw it tightly. That was</p> <p>17 what happens on site. You can see that in transcript 7,</p> <p>18 page 45.</p> <p>19 As I say, every Leighton engineer says this, except</p> <p>20 Henry Lai.</p> <p>21 So given that the sub-contractor knew that their</p> <p>22 work would be inspected, no one would, in their right</p> <p>23 mind, on a frolic of his own, just try to screw in two</p> <p>24 or three threads of the rebar into the coupler or choose</p> <p>25 not to screw them in at all, hoping that those</p>

Page 13	<p>1 inspecting their works would just blindly approve them</p> <p>2 and let them get away with it, and as we say, unless the</p> <p>3 person responsible for inspecting the works was the very</p> <p>4 person who told them to do it that way, and that person,</p> <p>5 we say, was Henry Lai.</p> <p>6 You have seen Ah Chun here. You have read his</p> <p>7 evidence. I'm not going to repeat it. So he explains</p> <p>8 how he found out about the Lenton couplers, he explains</p> <p>9 how there were inaccessible couplers. He then told you</p> <p>10 how he immediately informed Henry Lai, then Henry Lai</p> <p>11 told him to screw them in as much as he can. It's not</p> <p>12 as if the wall will collapse. We all remember that.</p> <p>13 That was what he said to you. So I'm not going to</p> <p>14 repeat his evidence.</p> <p>15 But, interestingly, Mr Steven Huyghe also looked at</p> <p>16 this. He said, on 4 October 2019, it's a pity Wing</p> <p>17 & Kwong was unrepresented at this time, but he said</p> <p>18 this. He was explaining what he called the NMF rule, of</p> <p>19 course I'm learning as well, the "not my fault" rule, so</p> <p>20 he applied that to the objective facts of this case and</p> <p>21 he said this, and I would like that transcript to be</p> <p>22 pulled up, please, on 4 October 2019, page 45, line 9:</p> <p>23 "It's common on projects that have a lot of tapered</p> <p>24 rebar.</p> <p>25 So resolution: you determine the number of bars you</p>	Page 15	<p>1 Commissioner Hansford: If they did --</p> <p>2 Answer: Not my fault. If they can't perform my</p> <p>3 work, so they are going to say, 'Not my fault. What do</p> <p>4 you want me to do with all these issues?'"</p> <p>5 He's still being tested by Commissioner Hansford:</p> <p>6 Commissioner Hansford: But there's another</p> <p>7 possibility -- I'm not saying this happened -- there's</p> <p>8 another possibility where they didn't report that and</p> <p>9 they just botched it.</p> <p>10 Answer: I don't believe that. Everybody on</p> <p>11 a construction site, in my opinion, wants to do a good</p> <p>12 job. I believe that. I have to believe it because I've</p> <p>13 been in construction for 50 years.</p> <p>14 Commissioner Hansford: I agree with you.</p> <p>15 Answer: They do report it. They just do not walk</p> <p>16 away and say -- because if an inspector comes along and</p> <p>17 catches this and they didn't report it to their foreman,</p> <p>18 they are out of work. They are fired.</p> <p>19 So this is not something that -- this happens. This</p> <p>20 in realtime happens, they report it, because -- and then</p> <p>21 the foreman reports it for the same reason: he doesn't</p> <p>22 want to have an inspector come and find out -- because</p> <p>23 he's going to have to go back in to do it all over</p> <p>24 again. So for cost-wise, he's not going to do it. So</p> <p>25 they are going to go to the general contractor [aka</p>
Page 14	<p>1 need, you prepare the proper tapered thread. A number</p> <p>2 10 bar takes about 15 minutes. Depending on how many</p> <p>3 you've got, it depends on how many -- but you do not try</p> <p>4 to screw in the parallel bar and leave it unconnected.</p> <p>5 That's what you don't do. And you do not pour the</p> <p>6 concrete unless it's fixed.</p> <p>7 Couplers exposed. Resolution: labourers to chip and</p> <p>8 locate. Care has to be [taken] because when they go</p> <p>9 down into that area and they chip that concrete out, you</p> <p>10 can't let it fall down to the bottom of the pour,</p> <p>11 because you will get your pour rejected because you got</p> <p>12 it contaminated; you've got to make sure you get it out</p> <p>13 of there. Then you install your rebar and then you pour</p> <p>14 the concrete."</p> <p>15 He was tested on this by Commissioner Hansford:</p> <p>16 "You see, Mr Huyghe, you had an NMF rule, 'not my</p> <p>17 fault'. There's also the NMJ rule, 'not my job', and</p> <p>18 I think that applies to this slide.</p> <p>19 Answer: I'm glad you voiced that out, because all</p> <p>20 these issues on a constructing site, when the rebar</p> <p>21 fixers came up with these problems, they walked up out</p> <p>22 of that hole and they went to somebody with Leightons</p> <p>23 and said, 'Here' -- or they want to their foreman and</p> <p>24 said, 'Come see what we're dealing with'. That's what</p> <p>25 would be common for all --</p>	Page 16	<p>1 Henry Lai] and say, 'What do you want to do?', and all</p> <p>2 of these resolutions that I'm going through are things</p> <p>3 that have to be done to make sure that the work is</p> <p>4 installed in accordance with the specifications."</p> <p>5 The next page, 48, line 2:</p> <p>6 "The contractor is pushing to get the concrete pour.</p> <p>7 The rebar fixer foreman is pushing the works to get</p> <p>8 done. He's pushing his guys in the field. The rebar</p> <p>9 fixer has got to come out of that hole and contact his</p> <p>10 foreman about 'not my fault' and he's going to contact</p> <p>11 the general contractor. Then that's up to the</p> <p>12 contractor to take the corrective actions to correct the</p> <p>13 issues.</p> <p>14 No inspections were conducted, and the concrete was</p> <p>15 poured with the defective work in place, not corrected."</p> <p>16 He's still being tested by Commissioner Hansford:</p> <p>17 "Because we've also heard that inspections may have</p> <p>18 been conducted.</p> <p>19 Answer: I heard that too but it's kind of like you</p> <p>20 went in and looked and there was all kinds of defective</p> <p>21 work, and I don't buy the fact that you couldn't have</p> <p>22 seen it."</p> <p>23 That is exactly what we say happened here. And</p> <p>24 that's not even evidence from Wing & Kwong or even</p> <p>25 submissions from me. It's an objective view of a person</p>

Page 17	<p>1 with 50 years of experience in the construction field, 2 looking at the facts objectively, telling us what must 3 have happened. 4 Even Leighton's engineer, Sean Wong -- you can find 5 that in the transcript on 6 June 2019, page 64, line 4. 6 I won't ask that to be pulled up, but he was asked this: 7 "If that rebar fixer representative who went to that 8 location saw any problem, such as a broken coupler or 9 things like that, would you expect him to inform one of 10 your junior engineers or inform yourself? 11 Answer: Yes." 12 Therefore I'm not going to take you through 13 Ah Chun's evidence again of how he reported the matter 14 to Henry Lai. It's simply the NMF rule. 15 CHAIRMAN: Sorry, just remind me again, Henry Lai, the gist 16 of Henry Lai's evidence or the main thrust of it was 17 that -- 18 MR TSOI: It never happened; he didn't know how it occurred. 19 CHAIRMAN: Yes. So he didn't see anything when he -- 20 MR TSOI: He said this -- I will come to that. He said he 21 inspected it, couldn't find anything, and he was never 22 told there were problems. It was just out of the blue 23 for him that there was a mismatch issue, but I will come 24 back to that. 25 CHAIRMAN: All right. Then the concreting went ahead?</p>	Page 19	<p>1 screw in the parallel rebars into the Lenton couplers, 2 praying that none of the professionals from MTR or 3 Leighton in their routine inspections or hold-point 4 inspections would notice", or Ah Chun got on the phone 5 and reported this to Henry Lai and asked Henry Lai what 6 to do, and he was told what to do: "Screw them in as 7 much as you can; the wall will not collapse." 8 This is a professional engineer telling Ah Chun what 9 to do, and this particular engineer can do this, he can 10 do this, because he was the one who was supposed to do 11 the inspection later. 12 So Leighton insists it's the first scenario, Wing 13 & Kwong must have acted on a frolic of their own. But 14 why would they? The fact that the raw materials were 15 provided to them was not Wing & Kwong's fault, and the 16 cost to rethread the rebars were the cost of Leighton's. 17 So what is in it for Ah Chun to do this? Henry Lai was 18 asked this very question by senior counsel for the 19 Commission: "What is in it for Ah Chun to do this?" 20 Even Henry Lai can't come up with a reason. 21 MTR says this. If we look at Michael Fu's evidence, 22 the construction engineer, and you can find that at page 23 BB80, paragraph 30 -- he says this: 24 "Even if it were the case that Leighton and/or its 25 sub-contractor were unable to screw the rebars into the</p>
Page 18	<p>1 MR TSOI: Yes. 2 CHAIRMAN: All right. 3 MR TSOI: As I say, I'm not going to repeat Ah Chun's 4 evidence, you've heard it, but I am going to say what 5 others said about Ah Chun. Every single Leighton 6 witness who has worked with Ah Chun personally said this 7 about him: he was a competent, serious, conscientious 8 and hard-working individual. This evidence comes from 9 Jeff Lii, Ronald Leung, Alan Yeung, even Henry Lai. 10 Now, Ah Chun knew that his works would be subjected 11 to inspections. He knew that if the rebar fixing works 12 failed inspection, he and his team would have to redo it 13 all over again at their own costs. The square peg/round 14 hole situation, the no-hole situation were visually 15 obvious. This is the point we have to remind ourselves: 16 Leighton was the party responsible for conducting 17 compatibility check in advance, Leighton was the party 18 who attended the interfacing meetings, Leighton was 19 responsible to provide the correct materials, and Wing 20 & Kwong had to follow Leighton's instructions. 21 Now, imagine you are Ah Chun. You go in there and 22 you see tapered couplers, and you are given parallel 23 threaded rebars. What would you do? Well, there are 24 only two possibilities. One, Leighton insists, "Ah Chun 25 and his team on a frolic of their own just tried to</p>	Page 20	<p>1 couplers given that the wrong materials had been 2 ordered, one would have expected that Leighton and/or 3 its sub-contractors would immediately halt the stitch 4 joints/construction joint works, raised the 'mismatch' 5 problem with MTRCL, and seek to resolve it by placing 6 an order for the right kind of materials. Leighton and 7 its sub-contractor, however, did not adopt what surely 8 was the obvious course of action to resolve the 9 'mismatch' problem." 10 Yes, that is exactly the "not my fault" rule in 11 application, except it can't work with Leighton because 12 they were at fault. They failed to do compatibility 13 check in advance. They failed to tell Henry Lai about 14 the Lenton couplers, and they failed to order the 15 correct rebars. It's because they were at fault they 16 don't want to tell MTR. They just wanted Ah Chun and 17 Wing & Kwong to continue their work. 18 What was Wing & Kwong supposed to do, faced with 19 that situation? Henry Lai, the engineer, has now given 20 express instruction and order, "Screw them in as much as 21 you can", knowing that Leighton can replace them with 22 another sub-contractor at any time, without 23 compensation. Is Ah Chun going to go down to his rebar 24 fixers who earn 1,000-odd a day and say, "You have to 25 stop working now because we were not given the correct</p>

Page 21	Page 23
<p>1 materials. We'll just have to just stop working and 2 stop your earnings"?</p> <p>3 Reality: Wing & Kwong had no choice. They did what 4 they were told.</p> <p>5 Of course, in the end, whether Ah Chun is telling 6 the truth or not is for the Commission, but what he said 7 is supported by the rebar fixer Leung Chi Wai who also 8 came to testify before you. But what one cannot say is 9 that Ah Chun has made this up for this Inquiry. That's 10 because ever since February 2018, when Wing & Kwong was 11 first confronted by Leighton with the accusations of 12 defective workmanship causing the water leakage, 13 et cetera, they have maintained the same version of 14 events.</p> <p>15 It's good to remind ourselves where we can find 16 those exchanges. You can find those in EE271. If I can 17 ask that to be pulled up. I will just take you through 18 these very quickly because you have seen them before.</p> <p>19 So this was Leighton's letter to Wing & Kwong. If 20 you turn to the last part:</p> <p>21 "Please be advised that should the cause of the 22 water leaks and cracks be due to defective work 23 undertaken or the materials supplied by your company, we 24 will seek to recover all costs ..."</p> <p>25 Well, Wing & Kwong never supplied any materials.</p>	<p>1 completed), the connection was found to be coupler with 2 taper-cut threads. Our Chun stated right away that the 3 rebar we prepared according to Leighton's information 4 which could not tighten into the coupler completely. 5 However, according to the verbal instruction given by 6 Leighton, there was not enough time to rethread the 7 rebar and your company urged our side to try our best to 8 tighten the rebar which are parallel threads into those 9 couplers."</p> <p>10 So Wing & Kwong has been saying this all along. 11 Let's see what Leighton says. Page EE293. That's 12 completely ignored. The last part of that page says 13 this:</p> <p>14 "It has been established that the sub-contractor has 15 failed to complete the sub-contract works in accordance 16 with the sub-contract by correctly affixing the rebar to 17 the couplers."</p> <p>18 Well, how, if you've got a square peg and round 19 hole?</p> <p>20 If you now turn to page EE300, and this is 21 extraordinary, because Leighton says this: 22 "The defective workmanship does not relate to the 23 materials. The defect relates to the failure of the 24 sub-contractor to install/connect the rebar and couplers 25 in accordance with the sub-contract requirements."</p>
Page 22	Page 24
<p>1 The next one, EE277. So the first reply from Wing 2 & Kwong was already that, "Our site supervisor, Ah Chun, 3 had deliberated the particulars with your engineer, 4 Henry Lai, about the incompatibility problem." That was 5 the first reply.</p> <p>6 EE290, this is now towards the end of the month, 7 26 February 2018, at the last part of that page:</p> <p>8 "The captioned location of the tunnel is connected 9 to another contract ... we could only communicate with 10 the main contractor ... through your company and there 11 not any way to get the details of contract 1111. To 12 make sure the connection is either coupler with parallel 13 threads or taper-cut ... our Chun has enquired with your 14 Henry [Lai] ... We received a reply from Henry [Lai] 15 that he did not know the details of contract 1111. He 16 then instructed us to prepare materials of parallel 17 threads, according to his experience and final confirmed 18 order material by Leighton. The materials of the 19 couplers was supplied by Leighton, Wing & Kwong [has] no 20 right to choose any brands [or type] ...</p> <p>21 The captioned work was launched in July 2017." 22 That may be a mistake but never mind.</p> <p>23 "After the concrete surface had been hacked off 24 (actually some of the couplers still not yet [I think 25 that means hacked off] after Leighton say hacked works</p>	<p>1 So it's poor workmanship that these poor rebar 2 fixers can't screw in a parallel rebar into a tapered 3 coupler, but not only that, by this time, the end of the 4 month, the mismatch problem was already revealed. So 5 when they say it was a workmanship problem, nothing to 6 do with the materials, that was a plain lie.</p> <p>7 So Wing & Kwong again, repeating themselves now, 8 EE301, saying it was Ah Chun, we couldn't tighten in, 9 this time more graphic, just in case Leighton don't get 10 the picture: you can't screw in those rebars into the 11 couplers.</p> <p>12 There are further exchanges where Leighton has 13 declined Wing & Kwong's request for a joint inspection, 14 because of course they are asking Wing & Kwong to pay.</p> <p>15 Now it's probably convenient to turn to the final 16 plea of Wing & Kwong, and you can find that at page 17 EE308. So we have skipped the few in between and now we 18 are at EE308. This is what I call the Wing & Kwong 19 final plea. Paragraph 1:</p> <p>20 "Wing & Kwong has no authority to choose any 21 materials and construction methods during the 22 construction period, we just strictly followed up the 23 main contractor instruction to complete the rebar fixing 24 project." 25 The next page, paragraph 5: "We requested joint</p>

Page 25	<p>1 inspection, but you declined." 2 Paragraph 6: "You are saying it is a workmanship 3 problem and you are now counterclaiming us for 4 40 million when our whole project sum was just 5 62.5 million." 6 The next part: 7 "Please note that we just a rebar fixing 8 sub-contractor, \$3.5 million is a very great amount for 9 us and this enough to influence our all projects ... and 10 ... [company]." 11 Because by this time, Leighton is refusing to pay 12 the remaining sum of that contract, on the excuse that 13 this was poor workmanship, nothing to do with materials. 14 And finally, Wing & Kwong says and I say, all this 15 is unreasonable and not fair. 16 So I have taken you through the exchanges between 17 Wing & Kwong and Leighton. Throughout all these 18 exchanges, one asks: what does Henry Lai say about them? 19 Because serious allegations have been made against him. 20 Bearing in mind these letters were written since 21 February 2018, he says nothing. He did not say 22 anything, not until he filed his third witness statement 23 before you, and that was 24 May 2019. That was the 24 first time Henry Lai tries to respond to these serious 25 allegations against him.</p>	Page 27	<p>1 response to the allegations. 2 (3) if not, explain why not." 3 So, in Henry Lai's most recent witness statement he 4 says this. He says he does not recall having any 5 conversation with Ah Chun about defective joints. He 6 did not recall having instructed Wing & Kwong to screw 7 in the rebars as much as they could. This conduct is 8 extraordinary because, if you think about it, these were 9 matters that, as Henry Lai himself admits in evidence, 10 went to his professional integrity. How convenient for 11 him to not recall? 12 And unbelievably, when being questioned here, 13 Henry Lai denied he ever had any meeting with Jon 14 Kitching about Wing & Kwong's allegations. He denied 15 it. Not until it was put to him that, "Hold on, 16 Mr Jonathan Kitching said there was such a meeting", 17 Henry Lai then suddenly remembers, "Ah, yes, I remember 18 there was such a meeting", but he cannot remember what 19 happened in that meeting. 20 This was a meeting about serious allegations made 21 against Henry Lai. Henry Lai has to see Jonathan 22 Kitching, a person who is high in the ranks in the 23 company, in such circumstances, and he is telling you he 24 can't remember -- 25 CHAIRMAN: Is this the meeting where Henry Lai was off -- he</p>
Page 26	<p>1 But that Henry Lai statement was right after 2 Jonathan Kitching, the project director of Leighton, 3 filed his witness statement on 23 May 2019. What 4 a coincidence, because in Jonathan Kitching's statement, 5 similarly for the first time, he said that there was in 6 fact a conversation between Henry Lai and Jonathan 7 Kitching about the allegations of Wing & Kwong. 8 Leighton said nothing about this before, nothing until 9 they were requested by the solicitors of this Commission 10 to come up with an answer. 11 You can find that email enquiry at page CC6486. 12 I would ask for that to be pulled up, please. The part 13 under "Jon Kitching": 14 "There was a series of correspondence between Jon 15 Kitching on behalf of Leighton and Wing & Kwong between 16 February 2018 and August 2018 [this has hitherto been 17 undisclosed by Leighton]. This correspondence has not 18 been dealt with by Henry Lai in his witness statement. 19 Jon Kitching, the project director, is therefore 20 required to provide a witness statement on the 21 following ... 22 (1) explain and confirm whether he has spoken to 23 Henry Lai about Wing & Kwong's allegations, in 24 particular those against Mr Lai himself at the time. 25 (2) If he has, describe and explain Mr Lai's</p>	Page 28	<p>1 claimed to have stood off at some distance? 2 MR TSOI: Yes, he claims so, yes, but not according to Jon 3 Kitching or Ah Chun, and why would he stand off at some 4 distance when the meeting is about him? He's simply not 5 telling the truth. 6 But it's interesting to see also what Jonathan 7 Kitching said at the meeting. You can find that at 8 page CC6488, paragraph 9. He says this: 9 "When I learned [about] the defects at the NAT 10 stitch joints and ... the shunt neck joint, I personally 11 sought out and spoke to Leighton's engineer who 12 supervised for these works, Mr Henry Lai. During that 13 conversation, I asked Henry why the rebar was not 14 properly connected to the couplers at the ... stitch 15 joints and the shunt neck joint and pressed him to 16 explain what happened. I cannot recall the exact words 17 of the conversation but the gist of Henry's response was 18 that he had no idea why the defects had occurred and did 19 not remember anything of note about the NAT stitch 20 joints and the shunt neck joint. I also recall that 21 Henry was upset when he heard about the defects." 22 CHAIRMAN: Sorry, can I just ask this. It's a question, not 23 a statement. It's not for this Commission to 24 accidentally or intentionally find itself resolving 25 matters of contractual liability.</p>

Page 29	<p>1 MR TSOI: It's not contractual liability because serious 2 allegations have been made against Wing & Kwong that 3 they did this on a frolic of their own, and that's the 4 problem: when such a serious allegation is made and 5 maintained by Leighton, we have to answer it. 6 CHAIRMAN: I'm not suggesting one ignores it. 7 MR TSOI: But we have to answer it and that's the point. 8 CHAIRMAN: Yes, all right. 9 MR TSOI: But if there's no such allegation, we wouldn't 10 even be here as a party. 11 CHAIRMAN: No, I appreciate that, but what you do have, 12 of course, is you have a situation where there were 13 interface meetings which go to the conduct of 14 construction and the management systems that are used in 15 the construction process, and it appears that those 16 meetings did not result in the question of Lenton 17 couplers and BOSA couplers being at odds with each other 18 coming out. 19 So it would appear -- subject to what's being said, 20 and my memory may well be very faulty -- that Leighton 21 accepts that that didn't resolve the way it should have 22 resolved, that is the interface meetings. 23 MR TSOI: In terms of the chain of command and the 24 information that should have been passed to Henry Lai, 25 that must be correct, but it's what they say afterwards,</p>	Page 31	<p>1 CHAIRMAN: It's about as good as shooting yourself in the 2 head. 3 MR TSOI: Yes. It doesn't end there. Because of the 4 inspection issue and the RISC forms which I shall come 5 to. 6 CHAIRMAN: All right. 7 MR TSOI: That is where I think Leighton's case really hits 8 the bottom, because you get a situation where one word 9 is against another and they just don't match. You have 10 Chris Chan saying he never inspected it, you have 11 Henry Lai who said, "Yes, you did", and that's where 12 I shall come to, but -- 13 CHAIRMAN: That's fine. I suppose what I was doing was just 14 sounding a warning shot that we should be careful, and 15 that may be a warning shot to myself actually more, that 16 we don't want to, in writing the report, find ourselves 17 accidental delving into issues of where civil liability 18 lies. 19 MR TSOI: That's absolutely right, but as I say we were only 20 invited to be involved in this Inquiry because of the 21 allegations made -- 22 CHAIRMAN: Allegations made as to workmanship and proper 23 conduct -- 24 MR TSOI: Precisely. That's why I have to answer that case. 25 CHAIRMAN: All right. Thank you.</p>
Page 30	<p>1 about -- 2 CHAIRMAN: Sorry, bear with me just a second. So that's 3 a process matter, not a civil liability matter. 4 MR TSOI: No. 5 CHAIRMAN: Then you have a situation where you have, as part 6 of the management of the construction process, 7 inspections. 8 MR TSOI: Yes. 9 CHAIRMAN: So you have no steps taken by Leighton to supply 10 correct couplers or to supply material that manages to 11 link up Lenton's and BOSA's. That follows on from the 12 suggested errors or oversights in the interface 13 meetings. Then you have, clearly, a failure to discover 14 what, at face value at least, would appear physically to 15 be a very obvious mismatch between BOSA and Lenton, when 16 it's Leighton's responsibility to actually make that 17 inspection. 18 MR TSOI: Right. That's right. That then links also to the 19 inspection aspect because -- 20 CHAIRMAN: So what you are saying, effectively, then is: we 21 are not talking about civil liability here, we are 22 simply saying that when you put everything together, 23 it's incomprehensible to suggest that we would have gone 24 off on a frolic of our own. 25 MR TSOI: Precisely.</p>	Page 32	<p>1 MR TSOI: So, as I was saying, Mr Kitching, he said that in 2 the meeting, Henry Lai's response was that he had no 3 idea why the defects had occurred, but he recalled 4 Henry Lai was upset when he heard about these problems. 5 Now, one asks then: why was he upset if he didn't do 6 anything wrong? But anyway, there was one problem with 7 this version and that's the point I was trying to come 8 to: inspection. Because if they conducted inspection 9 properly, they would have identified the defects, and 10 because -- whether Henry Lai in fact instructed Ah Chun 11 to screw in the rebars into the couplers or not -- and 12 that's a liability issue, it doesn't matter -- because 13 he was still the one who should have inspected the 14 works, otherwise Leighton can't explain why those joints 15 passed inspection and the concrete was poured. 16 So Leighton had to come up with a story about 17 inspection, and that's the point I'm coming to, and to 18 do that Henry has to lie about it. He has to come to 19 you here and say, although he had done up to 15 hours of 20 routine inspection, watching the rebar fixers doing 21 their work and two hours of rebar fixing checks, he 22 could not spot a single defective connection. He has to 23 come and say, faced with defects, as shown in the 24 pictures that we have in the NCRs -- we can just pull up 25 one at random, for example NCR95, page CC1323 or CC1324.</p>

Page 33	Page 35
<p>1 He has to come and say to you he didn't see that. He 2 was in fact asked by senior counsel for the Commission, 3 "How did you miss that?" He has to say, "I just did not 4 see it." When every other witness, including witnesses 5 from Leighton, Jonathan Kitching, William Holden, 6 Michael Fu, Tony Tang, they all say these were obvious, 7 but Henry Lai has to stick to the story, "I just did not 8 see it." 9 But that's not enough, because the rebar fixing 10 checks, as we know, were joint inspections with MTR, so 11 he has to lie about inspecting it with MTR, and although 12 he thought he could get away with it because, as we 13 know, there were no RISC forms -- and that's the 14 problem, when you have no RISC forms, you don't know who 15 inspected it -- except he picked the wrong guy because 16 he picked Chris Chan, as I said. Henry Lai says this in 17 his evidence: 18 "I was the Leighton engineer responsible for 19 conducting the rebar fixing check with MTRCL's 20 construction engineer for the 3 stitch joints and the 21 shunt neck joint. I confirm that I conducted those 22 checks with MTRCL's construction engineer (Chris Chan) 23 and no issues regarding the rebar and couplers and their 24 connections were discovered ..." 25 Chris Chan says:</p>	<p>1 RISC forms -- you are about to come to those, good. 2 Thank you. 3 MR TSOI: That's exactly why -- it explains why there were 4 no RISC forms from Henry Lai, because he can't get 5 Chris Chan to sign them. Chris Chan has never inspected 6 it. And curiously, if you look at Henry Lai's RISC 7 forms -- we can find some that predate the construction 8 of the subject joints. It goes back to July 2016. We 9 can also find some that were after the construction of 10 those joints. But just in that period that he is 11 supposed to have inspected the subject joints, we can't 12 find any of his RISC forms, not a single one. But we 13 won't be able to find any because Chris Chan never 14 inspected it with him. 15 But that's still not quite enough because Henry had 16 to lie about when he found out about the mismatch 17 problem. He has to pretend that this came out of the 18 blue for him; he never knew, he had no idea. But the 19 problem here is that he is starting to forget about the 20 lies, because he told you here that he found out about 21 the mismatch problem as soon as the first NCR was 22 issued, 9 February 2018. The problem is that NCR never 23 revealed the mismatch problem. The mismatch problem was 24 discovered later, late that month. So how did he know? 25 Because Ah Chun told him, long ago.</p>
Page 34	Page 36
<p>1 "I was never asked to inspect the 3 stitch joints or 2 the ... shunt neck joint." 3 Because that's not his job. And when Chris Chan was 4 asked about this he simply said, "Henry's lies were 5 unacceptable". And rightly suggested by Queen's Counsel 6 for MTRCL to Henry Lai, actually -- he said this: 7 "If it be found ... that you did instruct [Ah Chun] 8 to carry out defective work ... that would provide 9 an explanation ... why you didn't contact Mr Chan to 10 inspect: because you didn't want [Mr Chan] to see the 11 defective work?" 12 Transcript 5, page 114. That was exactly the case, 13 and that also explains why -- 14 CHAIRMAN: Sorry, Mr Chan said it wasn't his job to do the 15 inspection. 16 MR TSOI: And he didn't do the inspection. He never did. 17 CHAIRMAN: So who should have been asked to do it? 18 MR TSOI: Henry Lai says it was only Chris Chan and no one 19 else. That's the problem. 20 CHAIRMAN: Sorry, Mr Pennicott? 21 MR PENNICOTT: Kappa Kang. 22 CHAIRMAN: That's right, Kappa Kang, the lady. 23 MR TSOI: But he didn't inspect it with Kappa Kang according 24 to him. 25 CHAIRMAN: All right. And she didn't remember. And the</p>	<p>1 So with all these problems, Leighton was never going 2 to investigate what Wing & Kwong said or alleged. 3 CHAIRMAN: Sorry, just to help me again. There are no 4 relevant RISC forms -- 5 MR TSOI: Yes. 6 CHAIRMAN: -- I'm remembering back now, and Kappa Kang -- 7 MR TSOI: Can't remember. 8 CHAIRMAN: -- can't remember if she did it or didn't do it. 9 MR TSOI: Well, the factual evidence is this. Henry Lai 10 insists Chris Chan inspected the joints with him. 11 Chris Chan says he never did -- "It's not my job, it's 12 meant to be a CE-2", which was Kappa Kang -- and then, 13 when Kappa Kang came, Kappa Kang can't remember if she 14 did or not but she has no record of her having inspected 15 those joints. 16 CHAIRMAN: All right. Yes, that's right. Thank you. 17 MR TSOI: So with all these problems, Leighton was never 18 going to investigate what Wing & Kwong said or alleged, 19 because they know what the true position was, and they 20 didn't want themselves exposed. So instead Wing & Kwong 21 must be blamed for everything, and you can see that in 22 their closing submissions. They are still saying Wing 23 & Kwong should be blamed for everything, and it must be 24 said it's because of their workmanship that they can't 25 fit a square peg in a round hole.</p>

Page 37	Page 39
<p>1 Jonathan Kitching said this, at page CC6490 in his 2 evidence: 3 "On or around 26 February 2018, Leighton sent 4 a response to Wing & Kwong's letters. This was drafted 5 by Leighton's commercial team on the project. At that 6 time, we did not address Wing & Kwong's allegation that 7 they were acting on instructions because it was 8 irrelevant and it would not have been productive to 9 debate this matter with them." 10 "Irrelevant". This is an answer from supposedly 11 a large, responsible construction company, in light of 12 a serious allegation made against a person who held 13 an important position, because he was the engineer who 14 did a lot and a lot of hold-point inspections in this 15 project. Surely one has some interest to find out what 16 happened? Not Leighton. 17 Mr Kitching even had the audacity to come here and 18 say this: 19 "... Henry Lai was an extremely junior engineer 20 [therefore he] may not have understood what needed to be 21 done with [rebars and] couplers." 22 Transcript 6, page 135. The guy who is meant to be 23 inspecting the rebars and the couplers does not know 24 what he was meant to do? That was his answer in front 25 of you.</p>	<p>1 was raised on 19 March 2018. A meeting was also held 2 with the senior management of Wing & Kwong, the rebar 3 fixing sub-contractor responsible for the NAT works. 4 After the meeting it was decided that Wing & Kwong would 5 not be carrying out any further [action] on the project, 6 including the remedial work required to rectify the 7 defective stitch joints." 8 All those claims, pleas Wing & Kwong has made to 9 Leighton, through the exchanges I showed you, have just 10 been swept under the carpet with this response, when MTR 11 was asking, "What did you do to the sub-contractor?" 12 This answer is just completely untrue and utterly 13 misleading. But by this answer Leighton successfully 14 concealed the fact that Wing & Kwong has made various 15 allegations against it, that they have made specific 16 complaints against Henry Lai, "He instructed us to do 17 this", the fact that there have been serious exchanges 18 between Wing & Kwong and Leighton for the past month, 19 the fact that Leighton was informed that there was 20 an incompatibility issue by Wing & Kwong, the fact that 21 Wing & Kwong requested for joint inspection and Leighton 22 refused, and the fact that Leighton had lied to Wing 23 & Kwong even though they know that it's not 24 a workmanship problem, it's a materials problem, as I've 25 showed you.</p>
Page 38	Page 40
<p>1 Every junior engineer knew what they had to do. 2 They gave evidence of it. Leighton simply didn't want 3 the truth to be known. That's why they tried to conceal 4 it from MTR, and I'll show you this now, at page BB5073. 5 So MTR was asking questions, making enquiries: 6 "Well, what happened with the sub-contractors? Because 7 we only know there's a water leakage, we don't know what 8 happened with the sub-contractors. Have you found out 9 from them what happened, why are there cracks causing 10 the water to leak?" 11 The last part of the page: 12 "To this end, please provide the following: 13 ... 14 4. Details of actions taken against responsible 15 sub-contractor(s) in respect of the NAT issues; 16 5. Relevant reports produced or investigations 17 undertaken in relation to the NAT issues; 18 ... 19 9. All RISC forms relevant to the NAT issues". 20 So what's Leighton's response? We can find that at 21 page BB5083, at paragraph 4: 22 "Details of actions taken against responsible 23 sub-contractor(s). 24 Following the receipt of [the NCRs] ... related to 25 the ... stitch joint works, an internal non-conformance</p>	<p>1 So when it was put to Mr Kitching that his answer in 2 that letter was neither true nor accurate -- you can 3 find that in the transcript -- he couldn't even deny it. 4 He couldn't even deny it. 5 But there were other things that Leighton had to 6 cover, because if their story about inspection is to be 7 believable, they've got to put everything in one piece. 8 So, for example, Leighton had no answer why they failed 9 to conduct the joint inspection to ensure compatibility, 10 so they have Jim Wong coming along, who was the senior 11 site agent, and he attended various interfacing 12 meetings, and he claimed he gave no thought as to who 13 would be responsible to carry out the compatibility 14 check. He was asked this by Prof Hansford; he gave no 15 thought to it. And when Commissioner Hansford 16 confronted him with the interfacing 17 requirements/specifications, the instructions to them to 18 perform joint inspection, because Leighton under that 19 was supposed to carry out the joint inspection of the 20 waterproofing system, couplers, et cetera, 21 extraordinarily, in the face of that question, Jim Wong 22 said, "Er, that means it was the sub-contractor who was 23 meant to do the joint inspection." The sub-contractor, 24 the only party who never went to any interface meetings? 25 Transcript 9, page 124.</p>

Page 41	Page 43
<p>1 Then comes another problem. Leighton had no answer 2 to the fact that they ordered the wrong materials, so 3 they have to blame it on workmanship. And that's what 4 they are doing right now, even in this Inquiry. 5 Yet comes another problem: Leighton had no proof 6 that they did the rebar fixing checks, as Henry claims, 7 because Chris Chan has given a different story. 8 CHAIRMAN: Sorry, are they blaming it on workmanship? 9 MR TSOI: Yes. 10 CHAIRMAN: If they've Lenton couplers -- 11 MR TSOI: I've shown you the letters. I can show you again. 12 They are saying it's a workmanship problem. 13 CHAIRMAN: I'm not talking about correspondence that goes 14 between the parties prior to the Commission. I'm just 15 talking about within the Commission. 16 MR TSOI: Yes, they are not saying it's their fault, it's 17 our fault, and that's the problem. Anyway, I shall take 18 some time to find that, but I will come back to you on 19 that. 20 The other problem they have of course is they have 21 no proof, no record of Henry Lai conducting these 22 checks. 23 CHAIRMAN: So basically, then, it's a matter that going 24 ahead to try and connect non-compatible couplers -- 25 MR TSOI: It's a workmanship problem.</p>	<p>1 the rebar fixer then goes, "Okay, are you sure?" "Yes, 2 because it will take up to two weeks to rethread the 3 rebars, so that's fine." That's why, when there's 4 a problem, the NMF rule, you report it, Leighton will 5 then know, they will tell them what to do. 6 CHAIRMAN: I do recall having some exchange, I think it 7 might may have been with Ah Chun -- 8 MR TSOI: Yes, you did. 9 CHAIRMAN: -- about, "Why didn't you put this down in 10 writing, because you have been told to do something 11 which you knew was entirely wrong?" 12 MR TSOI: He knew that was not the correct way to install 13 them, but he didn't know it may pose a danger to 14 structural safety, because he was told the wall wouldn't 15 collapse. That's the problem. And he is not 16 an educated man. 17 CHAIRMAN: Is structural safety the only issue. There are 18 lots of other issues in building. It's not just 19 a question of whether it's going to fall on your head 20 and kill you. 21 MR TSOI: Absolutely right. But in hindsight, he did admit 22 this, "Yes, I should have put it down in writing", but 23 then you will recall in re-examination he admits that, 24 "Yes, I should have recorded it in writing, but I had 25 been working with Henry for a long time by then. He</p>
Page 42	Page 44
<p>1 CHAIRMAN: -- and the work with it was such an obvious 2 matter that to go ahead was itself sort of a reckless 3 and negligent action. 4 MR TSOI: Well, no one would do that except if they were 5 told. 6 CHAIRMAN: That may be -- I'm being provocative -- no one 7 would do it, full stop. To come back to my shooting 8 yourself in the head, if I say to you, "Shoot yourself 9 in the head", you will say, "No, I'm not going to do 10 that because I will kill myself", and equally, if you 11 are a professional organisation with a history of good 12 workmanship behind you and somebody says, "Try and do 13 the best you can with completely incompatible matters 14 that may cause structural difficulties later", you then 15 say, "No", or, "I want it somehow recorded in a very 16 clear and obvious way that I am instructed to proceed to 17 do this, even though I can tell you it's not possible to 18 do it." 19 I'm being provocative. 20 MR TSOI: You are absolutely right, but that is exactly what 21 Henry Lai said, though. He said, "Go ahead, screw them 22 in as much as you can, the wall will not collapse", and 23 what is the rebar fixer supposed to do when an engineer 24 tells him this, "You can screw it in, it doesn't matter, 25 the wall won't collapse". So that's the comfort, and</p>	<p>1 told me to do something, I will do it." But the point 2 is really whether he reported it, because if he did 3 report it Leighton's story cannot make sense. 4 CHAIRMAN: All right. But basically, if my memory is 5 correct -- and I'm sort of testing this out and you can 6 correct me -- it's really a case of Henry Lai saying, 7 "Look, fudge this as best you can", and Ah Chun saying, 8 "Okay" -- 9 MR TSOI: I wouldn't use the word "fudge". 10 CHAIRMAN: -- and, "We don't tell anyone else about it". 11 MR TSOI: They didn't need to tell anyone else because from 12 Ah Chun's perspective this would be inspected. 13 CHAIRMAN: Yes. 14 MR TSOI: Because they never said no one would inspect it. 15 Ah Chun's view was that this would be inspected and if 16 it doesn't pass inspection we will redo it, but we will 17 say, "Hold on, but you told us to do it", and that's why 18 he said to Henry Lai, "If we have to redo this part, 19 just this part, then you are paying for it, not us." 20 CHAIRMAN: I understand. That helps me. Thank you. 21 MR TSOI: So we found the reference in Leighton's closing 22 where they still maintain the allegation. You can find 23 that in Leighton's closing submissions. 24 MR PENNICOTT: Paragraph 6. 25 MR TSOI: Paragraph 6. Thank you.</p>

Page 45	Page 47
<p>1 CHAIRMAN: All right.</p> <p>2 MR TSOI: That's why I'm here.</p> <p>3 CHAIRMAN: Yes.</p> <p>4 MR TSOI: There comes another problem: Leighton had no proof</p> <p>5 that Henry Lai did inspections because there is no</p> <p>6 record, there is no RISC form.</p> <p>7 CHAIRMAN: If you are saying that's why you are here,</p> <p>8 perhaps we could deal with this.</p> <p>9 MR TSOI: Sure.</p> <p>10 CHAIRMAN: That's why I'm the one sort of pulling you in</p> <p>11 that direction. Because yes, I agree you have these</p> <p>12 moral complexities where the engineer says, "Oh", to use</p> <p>13 my term, "fudge it as best you can", but if you yourself</p> <p>14 have responsibilities to ensure the workmanship is done</p> <p>15 well, you know it's likely to be inspected, perhaps by</p> <p>16 third persons, then before you go ahead doing what you</p> <p>17 know is going to amount to defective workmanship, is</p> <p>18 there not --</p> <p>19 MR TSOI: But he didn't know it amounted to defective</p> <p>20 workmanship because he only knew that that work,</p> <p>21 Henry Lai said it was safe, that work would be subject</p> <p>22 to inspection, and he had a contractual obligation to</p> <p>23 follow instructions and that's the point of the</p> <p>24 sub-contract, that clause I read out to you, that they</p> <p>25 have to follow the site team of Leighton, in terms of</p>	<p>1 on Leighton's site diary records, joint inspections must</p> <p>2 have been properly conducted, must have been, because</p> <p>3 the work for rebars and the concrete was recorded in the</p> <p>4 diary.</p> <p>5 That suggestion is simply false and, as you will</p> <p>6 recall, the incident of the VRV room, you will recall in</p> <p>7 the VRV room that notwithstanding Leighton failed</p> <p>8 inspection, they still allowed the concrete to be</p> <p>9 poured.</p> <p>10 Then comes a final problem. There's no motive for</p> <p>11 Wing & Kwong to do this; there's no motive for them to</p> <p>12 do defective work. Whilst there's a clear motive for</p> <p>13 Leighton -- because they were rushing through the works,</p> <p>14 they were behind schedule, and to rethread the rebars in</p> <p>15 the Lenton yard, I think it was in Yuen Long, would take</p> <p>16 up to two weeks -- but there's no motive for Wing</p> <p>17 & Kwong to do this on a frolic of their own.</p> <p>18 So Leighton have to ascribe a motive to Wing</p> <p>19 & Kwong, and they try to do this by suggesting that Wing</p> <p>20 & Kwong paid their sub-contractor, Loyal Ease, on the</p> <p>21 basis of the weight of the rebar works completed. So</p> <p>22 the argument runs, it was in Wing & Kwong's interest for</p> <p>23 them to spend as little time as possible on each</p> <p>24 project, so the argument runs.</p> <p>25 But that motive turned out to be a complete mistake</p>
Page 46	Page 48
<p>1 extent of the sub-contract.</p> <p>2 We can go back to it, but it says, "You have to</p> <p>3 follow the instructions of Leighton's site team on</p> <p>4 timing and extent of the works." So what's Wing & Kwong</p> <p>5 supposed to do?</p> <p>6 CHAIRMAN: There's also -- I hate to say this -- common</p> <p>7 sense. There's also men with experience standing there</p> <p>8 at the work site and saying, "What? You want me to put</p> <p>9 these couplers into those couplers? They don't fit.</p> <p>10 The job's going to be -- are you prepared to put down in</p> <p>11 writing you want me to do this despite X, Y and Z? If</p> <p>12 so, I'll go ahead."</p> <p>13 MR TSOI: There is no dispute about nothing is in writing,</p> <p>14 but that's the point.</p> <p>15 CHAIRMAN: In any event, it's an argument, it's not a matter</p> <p>16 of fact.</p> <p>17 MR TSOI: I mean -- and I'll come back to this, because what</p> <p>18 is inescapable is the fact that you can't miss this in</p> <p>19 inspection.</p> <p>20 So no proof that Henry Lai did the inspection</p> <p>21 because we have no RISC forms, so Henry Lai came along</p> <p>22 and made up a story about inspecting it with Chris Chan.</p> <p>23 Chris Chan says no. But because Chris Chan says no,</p> <p>24 Leighton had to do something else, so along came Karl</p> <p>25 Speed and he said this. He tried to suggest that based</p>	<p>1 because, as you know, it's not challenged that Loyal</p> <p>2 Ease never received the payments on the basis of weight</p> <p>3 of rebars work completed, and the workers were paid on</p> <p>4 a daily basis. So that motive is gone.</p> <p>5 In fact, you will recall that I invited Mr Shieh,</p> <p>6 senior counsel for Leighton, to put this case, to put</p> <p>7 this motive, to the witnesses of Wing & Kwong, because</p> <p>8 I didn't want it raised again. He declined the</p> <p>9 invitation, but he is maintaining that allegation in his</p> <p>10 closing submissions.</p> <p>11 So, in conclusion -- I'm sure, Chairman, you are</p> <p>12 glad I'm finally there -- we see all that. We can say</p> <p>13 this. Leighton -- I don't think they really operated</p> <p>14 under the NMF rule, the "not my fault" rule. Instead,</p> <p>15 they have chosen to come here, to put forward</p> <p>16 a calculated and convoluted story, under the rule of</p> <p>17 "nothing can be my fault". But for Wing & Kwong, as we</p> <p>18 said when opening the case for Wing & Kwong, ultimately</p> <p>19 the Commission may think whether Henry Lai owns up to</p> <p>20 instructing Ah Chun to do all that, in the end, in the</p> <p>21 scheme of things, does not assume great importance.</p> <p>22 I accept that. But one must remember that Leighton's</p> <p>23 claim that they inspected the works properly and found</p> <p>24 no defect cannot be true.</p> <p>25 This is an inescapable fact, and not even Leighton's</p>

Page 49	Page 51
<p>1 attempt to cover it up can overcome that simple fact. 2 So one is compelled to one of two conclusions: they 3 either did not inspect the work properly or at all, or 4 those inspecting it knew of the problem and 5 notwithstanding that asked the rebar fixers to continue 6 and let the concrete be poured. That is why, we hope, 7 that Wing & Kwong will not be made Leighton's scapegoat 8 in this Inquiry. 9 That's all I wish to say. 10 CHAIRMAN: Sorry, Leighton's scapegoat in what way? 11 MR TSOI: Because they are still saying, it's defective 12 workmanship, it's our fault, it's not the materials' 13 fault. 14 CHAIRMAN: Okay. Good. So it's nothing to do with civil 15 liability, contractual liability -- 16 MR TSOI: That's not what I'm looking at, nor am I retained 17 to fight them in civil liability. 18 CHAIRMAN: All right. Good. Thank you very much. 19 MR KHAW: Mr Chairman, I wonder whether we should have 20 an early morning break first because -- 21 CHAIRMAN: Yes, it seems to be a good time. Excellent. 22 How long do you think you're likely to be, Mr Khaw? 23 It's a magisterial document you have put before us. 24 MR PENNICOTT: Three! 25 MR KHAW: We hope we can finish before lunch.</p>	<p>1 best when you say nothing at all", so you will have the 2 benefit of the submissions from Mr Chow in that regard. 3 In COI 1, to just recap, we have looked at the 4 alleged incidents of rebar cutting and also the issues 5 concerning defective and incomplete coupler connection 6 works, for the construction at the diaphragm wall and 7 platform slab. 8 The Commission has also considered the deficiencies 9 on the part of MTR and Leighton, including the failure 10 to follow the required supervision and inspection 11 requirements and also failure to compile and keep 12 contemporaneous records for the required supervision and 13 inspection, et cetera. 14 If I can just invite the Commission to turn up our 15 COI 2 factual closing. We have first identified the 16 three issues in the extended terms of reference for 17 COI 2. Just to refresh our memory, they are the three 18 defective stitch joints at NAT, non-compliance issues at 19 shunt neck connection, at the interface, which is in 20 connection with the issue dealt with by Mr Tsoi this 21 morning; lack of inspection and supervisory records, 22 including RISC forms, unauthorised design changes and 23 incomplete testing records of materials at NAT, SAT and 24 HHS. 25 We have set out in our written closing a flow or</p>
Page 50	Page 52
<p>1 CHAIRMAN: I'm happy to inch my way into the lunch hour. So 2 I will leave that very much in your hands. 3 MR KHAW: I am grateful. 4 CHAIRMAN: Thank you. 5 (11.18 am) 6 (A short adjournment) 7 (11.38 am) 8 Closing statement by MR KHAW 9 MR KHAW: May it please you, Mr Chairman. 10 It was about one year ago, also before Chinese New 11 Year, when I was standing here making my closing 12 submissions in COI 1. Obviously no one could imagine 13 that one year later I would still be standing here, 14 albeit with another three sets of closing submissions. 15 Mr Chairman and Mr Commissioner, I will deal with 16 the factual closing for COI 2 first, then I will move on 17 to discuss some issues in relation to project management 18 which are relevant to both COI 1 and COI 2 because we 19 note that Mr Rowsell made recommendations both on COI 1 20 and COI 2, even though those recommendations, to 21 a certain extent, overlapped, but I will explain later. 22 Regarding the structural engineering issues for both 23 COI 1 and COI 2, in view of Mr Chow's knowledge in this 24 area and also his able assistance, I have always 25 reminded myself of the lyrics of a song, "You say it</p>	<p>1 a summary of the issues that we will address. Perhaps 2 I may reorganise some of the subsections a bit for 3 today's purposes. Following the written submissions, 4 I will first deal with section B below, if I can just -- 5 yes. Section B will be the causes and extent of cracks 6 and water seepage identified at the original stitch 7 joints and shunt neck joint. They are the physical 8 findings, and I probably will go through them relatively 9 quickly, because they have all been summarised in our 10 written closing. 11 Then section C deals with MTR's PIMS system. 12 I will, after C, jump to E, lack of RISC forms, because 13 they are closely connected. Then section D will be lack 14 of or ineffective site supervision and inspection. Then 15 E, breakdown in communication; G, failure to comply with 16 material testing requirements; and H, unauthorised 17 deviations. 18 In fact, we find comfort that in most of those 19 issues, similar comments and observations to those given 20 by the government have been made by the Commission's 21 legal team, and I will at appropriate junctures refer to 22 relevant parts of their written submissions in due 23 course. 24 If I may then start with our section B first. It 25 basically sets out the defects discovered in relation to</p>

Page 53	<p>1 the three areas which are the subject matters of COI 2: 2 first of all, water seepage at the newly constructed 3 joint 1, ie the stitch joint of NSL at the interface 4 of contract 1111 and contract 1112. Separation gaps 5 were observed where water seepage was identified. Then 6 MTR instructed Leighton to chip off some parts of the 7 concrete, and this exercise further revealed that 8 several exposed rebars were not coupling to the 9 couplers. 10 Then similar investigations were conducted in 11 respect of the internal stitch joint of NSL, which was 12 about 20 metres away from joint 1, and also joint 3, the 13 same condition, namely "the several exposed rebars were 14 not coupling to the reserved couplers", was also 15 observed. 16 We have also made reference to Mr William Holden's 17 evidence in relation to his observation of the condition 18 of the defective rebar connections at the stitch joints 19 before the demolition. Then they have been summarised 20 in paragraph 9 of our closing. Regarding the interface 21 joints, he observed that on the side of contract 1111 22 there were instances of partial engagement and even no 23 engagement. For partially engaged couplers, only two to 24 three threads were screwed in. That was due to the fact 25 that someone had attempted to screw parallel-threaded</p>	Page 55	<p>1 the two sides of the interface stitch joints. Both 2 Lenton and BOSA couplers were used on the contract 1111 3 side, whereas BOSA couplers were used on the 4 contract 1112 side. For BOSA couplers, the connecting 5 rebars have to be parallel threaded rebars, whereas the 6 threaded part of the connecting rebar for Lenton has to 7 be tapered. 8 We have also set out the sequence of works for the 9 construction of the interface stitch joints, and I will 10 not repeat here. They have been summarised in 11 paragraph 15. 12 More importantly, paragraph 16: in order to achieve 13 proper connection to the Lenton couplers, it was 14 incumbent upon Leighton to ensure that appropriately 15 threaded rebars would be used. 16 We have heard evidence from various witnesses. One 17 of the main witnesses in this respect is obviously 18 Mr Henry Lai. Henry Lai's evidence is that he was not 19 aware that Lenton couplers were used on the Gammon 20 side, ie the 1111 side, and only ordered BOSA rebars 21 for installation into Lenton couplers. Given this 22 mismatch, BOSA rebars could only be screwed in for two 23 or three threads into the Lenton couplers. That is what 24 we have stated in paragraph 17. 25 Also, we have seen the interface specification which</p>
Page 54	<p>1 rebars into Lenton tapered couplers -- the Lenton 2 couplers, which would need tapered rebars. On the side 3 of contract 1112, there was a combination of some of 4 them were installed correctly, full engagement, and 5 others were not installed at all, they were put close to 6 the coupler. Then at the internal stitch joint, there 7 were instances of full engagement and also 8 non-engagements, et cetera. 9 At paragraphs 10 and 11, we have made the point that 10 even up to now MTR and also Leighton are still not able 11 to identify the exact cause of the defective coupler 12 installation works at those locations, and the existence 13 of the defects strongly indicates that the hold-point 14 inspections have failed to prevent or detect improperly 15 connected or unconnected couplers. That will be one of 16 the issues on project management that I will address 17 later on. 18 Regarding potential contributing causes, one of the 19 primary causes that we have heard evidence on, and that 20 also relates to the factual dispute between Leighton and 21 Wing & Kwong, is the mismatch of materials. 22 We have set out the factual background in from 23 paragraph 14 onwards. Just to refresh our memory, 24 paragraph 14: the problem of mismatch of materials 25 arises out of the use of different types of couplers on</p>	Page 56	<p>1 actually requires a joint site inspection to be carried 2 out by Gammon and also Leighton on the waterproofing 3 system, couplers, protection measures, et cetera, 4 provided at the interface. Leighton was required to 5 accept and maintain the waterproofing system, couplers 6 and protection measures to coupler provided at the 7 interface work. However, it is also Henry Lai's 8 evidence that he was not aware of this interface 9 specification, and there is no record to show that the 10 required joint site inspection had ever taken place. 11 We would leave this factual dispute to Mr Tsoi and 12 Mr Shieh, who obviously address you on this point, but 13 from the government's point of view we have set out some 14 observations arising from this factual dispute. 15 First of all, we say that the lack of awareness on 16 the part of Henry Lai actually reveals serious 17 deficiencies in relation to the project management 18 system of MTR and also Leighton. We have set out the 19 reasons in paragraph 19. 20 In particular, we wish to highlight 21 subparagraph (2): as a matter of fact, MTR had passed on 22 such information, ie the information regarding the 23 difference in requirements between the two kinds of 24 couplers. Such detail was recorded in the minutes of 25 the interface meetings between MTR, Leighton and Gammon.</p>

Page 57	Page 59
<p>1 It was, as Leighton acknowledged, due to a breakdown in 2 communication that the frontline engineer was ignorant 3 of this fact and ordered BOSA rebars to be connected to 4 Lenton couplers.</p> <p>5 In section B, we have also identified some other 6 defects or some other, I should say, causes of the 7 defects regarding the damaged couplers. I do not wish 8 to repeat most of the details. But in paragraph 22, we 9 have stated that one of the potential causes which 10 emerges from Wing & Kwong's witnesses, Mr Leung 11 Chi Wah -- it is said in respect of joint 3, a handful 12 of couplers were not exposed or not fully exposed on the 13 Leighton side of joint 3. There were also damaged 14 couplers but they were relatively rare. Then he also 15 encountered similar problems at joint 1.</p> <p>16 Then we have also identified poor workmanship and 17 also lack of proper supervision as one of the main 18 causes regarding the defects in relation to coupler 19 connections discovered.</p> <p>20 If I can come to B4 of our written submissions, "The 21 dispute between Wing & Kwong and Leighton". I do not 22 wish to repeat the conflicting evidence in this regard 23 as between Wing & Kwong and Leighton, but the government 24 has the following observations to make at paragraph 31 25 of our written submissions. We say the issue of</p>	<p>1 works would not be discovered or rejected by MTR.</p> <p>2 But whoever is telling the truth and however one is 3 going to resolve this factual dispute, we say that the 4 following points are important for the purpose of the 5 expanded terms of reference of this Inquiry.</p> <p>6 First of all, the information regarding the use of 7 Lenton couplers, which was communicated to Leighton at 8 the interface meetings, was not passed on to the 9 frontline engineer.</p> <p>10 Henry Lai did not take any initiative to check the 11 couplers used on the Gammon side, which, if done, would 12 have enabled him to discover the issue of 13 incompatibility.</p> <p>14 Henry Lai did not know there was interfacing 15 requirement, ie the specification I just mentioned.</p> <p>16 As mentioned above, there is no record showing 17 a joint site inspection as required under the interface 18 requirements. Even if such inspection had taken place, 19 mismatch of materials was not spotted.</p> <p>20 The defects were not picked up by MTR and Leighton 21 during the routine and hold-point inspections.</p> <p>22 We say, in conclusion, even if Wing & Kwong had made 23 their own decision to cut corners or to put the wrong 24 rebars into the Lenton couplers, Leighton's and MTR's 25 supervision and inspection system ought to have</p>
Page 58	Page 60
<p>1 mismatch must or at least ought to have been picked up 2 by the rebar fixing workers during the execution of the 3 steel fixing works as Wing & Kwong encountered 4 difficulties in screwing the BOSA rebars into Lenton 5 couplers.</p> <p>6 The rebar fixing workers, in the ordinary course of 7 events, should have brought this problem to the 8 attention of Leighton. It is unlikely that workers 9 would have decided on their own frolic to proceed with 10 the works despite their knowledge that the rebars could 11 not fit into the couplers.</p> <p>12 (3) It follows that it is highly improbable that 13 there would have been no discussion or communication 14 whatsoever between Wing & Kwong and Leighton on the 15 problem of mismatch.</p> <p>16 On the other hand, it is also unlikely that a junior 17 engineer of Leighton in the position of Henry Lai would 18 have taken it upon himself to direct Wing & Kwong or the 19 rebar fixing workers to continue to work on the wrong 20 materials without having any green light from any of his 21 superiors, because this would obviously run the risk of 22 causing further costs of replacement and/or repair.</p> <p>23 And (5): it would only make sense for Henry Lai to 24 have done so if he had obtained the approval of his 25 superior and also if he was confident that the defective</p>	<p>1 prevented the events from happening. We say there is 2 a systematic failure on their part, in their respective 3 supervision and inspection works.</p> <p>4 The next part, C, I will first deal with very 5 briefly, the specifications under the PIMS of MTR. As 6 you can see from paragraph 35, in relation to the 7 requirement of the practice note of PIMS, it includes 8 request for inspection, test and survey checks shall be 9 made by means of a standard RISC form. The senior 10 construction engineer of MTR is required to retain RISC 11 forms related to on and off-site inspection, and the 12 senior construction engineer is responsible for keeping 13 contemporaneous records.</p> <p>14 Perhaps before I move on, I forgot to mention, after 15 my discussion in relation to the factual dispute between 16 Wing & Kwong and Leighton, I should have referred the 17 Commission to a part of the Commission's COI 2 factual 18 closing, paragraph 108:</p> <p>19 "As pointed out by the government ... however, 20 whether Wing & Kwong or Leighton's witnesses are telling 21 the truth, and whatever may be the answer so far as 22 MTRCL's inspections are concerned, none of this may be 23 particularly important for the purposes of this Inquiry. 24 What is more significant is the non-compliance of the 25 requirements of contract 1112 and the systematic failure</p>

<p style="text-align: right;">Page 61</p> <p>1 in discovering the defects. But for the subsequent 2 water seepage problem which manifested itself in August 3 2017, the coupler connection defects would have gone 4 unnoticed and the NAT would have been put to use with 5 such defects existing. All parties involved, including 6 Wing & Kwong, Leighton and MTR should be criticised." 7 We obviously endorse this view, and this is 8 consistent with our analysis in our written closing for 9 COI 2. 10 So back to PIMS, paragraph 35 of our COI 2 closing, 11 I just mentioned. 12 Then if I can move on to discuss the issues arising 13 from the lack of RISC forms or the failure to retain 14 proper RISC forms. We have set out our analysis of the 15 relevant evidence in paragraph 36. First of all, MTR's 16 witnesses are not able to give any good explanation or 17 answer as to the person responsible for filling in the 18 RISC register. And also MTR's inspector of works, Tony 19 Tang, he gave evidence that it is his understanding that 20 whoever is responsible for carrying out the inspection 21 is responsible for also updating the RISC forms. But 22 Kappa Kang, who at the material time conducted many 23 hold-point inspections, disagreed with this suggestion 24 and maintained that it was not part of her job to update 25 MTRCL's RISC forms.</p>	<p style="text-align: right;">Page 63</p> <p>1 to be complied with strictly. It should however be 2 noted that it is also Kit Chan's evidence that pours for 3 the stitch joints would not be minor pours, thus 4 suggesting that the RISC form procedure for such works 5 ought to have been complied with by Leighton's and MTR's 6 site staff. 7 Also, we have evidence that Kit Chan failed to 8 convey clearly to his staff what constituted major pours 9 and what constituted minor pours, and he simply left it 10 to the frontline engineers to decide on their own. 11 Also, the issue of lack of RISC forms was not timely 12 escalated to the senior management of MTRCL. I will 13 deal with that further when I talk about the issue 14 regarding breakdown in communication later. 15 At paragraph 37 we say the above attitude towards 16 the PIMS requirements, both in relation to ensuring RISC 17 forms were issued and also the results were clearly 18 recorded in the RISC register, adopted by MTR staff from 19 the level of construction engineers up to construction 20 manager, was unacceptable. 21 We also say that such lax approach taken by MTR 22 obviously caused Leighton to pay insufficient attention 23 to the significance of complying with the RISC form 24 requirements. 25 Here, I wish to highlight the fact that Leighton's</p>
<p style="text-align: right;">Page 62</p> <p>1 MR PENNICOTT: Register. 2 MR KHAW: RISC register. 3 The confusion amongst MTRCL's staff on this issue, 4 as to who is required to maintain the RISC register, is 5 not easy to understand, but the evidence reveals that 6 the frontline MTRCL engineers, such as Kappa Kang, only 7 received minimal training on PIMS requirements. She 8 also testified that she at most received only a one-hour 9 training on PIMS when she was a graduate engineer, and 10 no more thereafter. This was so despite the fact that 11 PIMS documents stretch over 700 pages. 12 We also focus on the general attitude of MTRCL's 13 staff, as the evidence seems to demonstrate that most of 14 them did not treat the RISC form requirements seriously. 15 First of all, Kappa Kang openly acknowledged that 16 both MTR's construction engineering team and 17 inspectorate teams were well aware of Leighton's failure 18 to submit RISC forms on time; however, despite reporting 19 the issue to her superiors, Chris Chan and Joe Tsang, 20 her superiors, did not ask her to suspend the rebar 21 inspection. 22 Then we have the evidence of Kit Chan, and he 23 mentioned that "the contractor normally do not pay high 24 attention to the RISC forms requirements". He then said 25 that for minor pours the RISC procedure would not need</p>	<p style="text-align: right;">Page 64</p> <p>1 project director, Jonathan Kitching, under 2 cross-examination, acknowledged that if MTRCL had 3 insisted that no inspection would be carried out unless 4 RISC forms were duly submitted, Leighton would certainly 5 have put in more resources to ensure that the RISC form 6 requirements were properly complied with. So that is 7 why we say that the attitude or the culture in MTRCL 8 regarding the significance of RISC form is of great 9 significance when it comes to the overall project 10 management. 11 If I can then, as I said, jump a bit to my original 12 section E, the lack of RISC forms. Here I do not wish 13 to repeat what we have stated here, but I will just 14 highlight one or two points. Paragraph 69. The reality 15 is that as a result of the missing RISC forms, it is now 16 impossible to actually ascertain whether hold-point 17 inspections had in fact been conducted for the rebar 18 fixing works at the original stitch joints and the shunt 19 neck joint and who actually conducted those inspections. 20 Michael Fu gave evidence that he attempted to identify 21 the engineer who conducted the inspections at the 22 original stitch joints in February or March 2018, but to 23 no avail. 24 Then at paragraph 70 we have highlighted a factual 25 dispute between MTR and Leighton as to the identity of</p>

<p style="text-align: right;">Page 65</p> <p>1 the MTR staff who has allegedly conducted the hold-point 2 inspections. In fact, this was, I believe, briefly 3 touched upon by Mr Tsoi in his submissions, but if I may 4 just summarise briefly the relevant evidence in this 5 regard. 6 Henry Lai's evidence is that he positively recalled 7 that he conducted the rebar hold-point inspections with 8 Chris Chan. However, Chris Chan insisted that he did 9 not conduct any of the rebar hold-point inspections with 10 Henry Lai. Instead, Chris Chan believed that it is 11 likely that it was either Tony Tang or Kappa Kang who 12 conducted such inspections on behalf of MTR. Tony Tang, 13 however, said that he did not conduct rebar fixing 14 checks, other than in NFA. Kappa Kang, on the other 15 hand, gave the repeated answer that she has no 16 recollection of conducting the rebar inspections. 17 So even within MTR there was this uncertainty or 18 unknown factor regarding who actually carried out the 19 hold-point inspections for the stitch joints. We say 20 that this could have been avoided, at paragraph 71, if 21 MTR and Leighton had put in more effort in trying to 22 comply with their obligations to maintain a complete set 23 of RISC forms and also the RISC form register. 24 Then I wish to also highlight paragraphs 72 and 73, 25 the reason being that MTR, I believe in the opening</p>	<p style="text-align: right;">Page 67</p> <p>1 sources of information such as photos and WhatsApp 2 messages showing inspection had taken place, and (b) 3 compilation of RISC forms was time-consuming and not 4 user-friendly, et cetera. 5 We disagree with this approach and we have given our 6 answer in paragraphs 79 and 80. In fact, in 7 paragraph 80 we refer to Mr Rowsell's opinion that it 8 would be unsafe to simply retrieve such alternative 9 records for the purpose of verifying the relevant 10 information regarding inspection, and we agree with his 11 observation. 12 In fact, in paragraph 82 of our written closing, we 13 have set out various explanations or I would say excuses 14 put forward by the parties in trying to explain the 15 failure to submit RISC forms. I do not wish to go into 16 the details here because the Commission's legal team has 17 also comprehensively dealt with all the excuses one by 18 one. They can be found at the Commission's COI 2 19 factual closing, from paragraphs 167 to 176. I will not 20 ask the Commission to turn that up. I'm sure that 21 Mr Pennicott tomorrow will address those points. 22 Finally on RISC forms, I would ask the Commission to 23 consider paragraphs 86 to 87. At 86 we basically try to 24 deal with the suggestion regarding a change of the 25 system. We say that any change of the system should not</p>
<p style="text-align: right;">Page 66</p> <p>1 submissions for COI 2, suggested that RISC forms perhaps 2 are administrative or procedural in nature. At 3 paragraph 73, we have tried to cast our minds back to 4 what evidence we have heard or the submissions that we 5 have heard in COI 1, because in COI 1 we encountered 6 this problem regarding the lack of record sheets, not 7 the RISC forms but the record sheets, for the inspection 8 of coupler installation in the EWL and NSL slabs. 9 Evidence was then adduced by MTR and also Leighton 10 regarding what actually constituted alternative evidence 11 in order to verify what had been done. At that time, 12 their evidence was, "You look at the RISC forms. The 13 RISC forms could at least constitute some evidence in 14 order to reconstruct what had been done." 15 This actually goes contrary to any suggestion that 16 RISC forms are merely procedural or administrative in 17 nature, and we have set out MTR's submissions in that 18 regard -- we have set out interim report, at 19 paragraph 301, where the Commission recorded Leighton's 20 and MTR's submissions in that regard. 21 On the RISC form issue, I also would like to 22 highlight paragraph 78. During cross-examination of 23 Ralph Li from the Highways Department, counsel for 24 Leighton suggested that the government should just do 25 away with the RISC forms because (a) there were other</p>	<p style="text-align: right;">Page 68</p> <p>1 be initiated by any individual unilaterally, in 2 a cavalier manner, without any comprehensive discussions 3 with all relevant parties, because we have a suggestion 4 from MTR's witnesses and also Leighton witnesses that 5 perhaps the system was modified in the sense that the 6 engineers or the frontline staff, at the material time, 7 preferred to rely on alternative messages for that 8 purpose, and we say if that is the case one has to have 9 a comprehensive discussion with all relevant parties 10 beforehand. 11 So that deals with the RISC forms and also PIMS. 12 We will now go to my original section D, regarding 13 lack of effective site supervision and inspection. 14 We say that the failure to ensure the RISC form 15 requirements is first of all not just a technical 16 contractual breach. It directly relates to the quality 17 of the overall supervisory and control mechanism, 18 because, as I have just explained earlier, in the 19 absence of proper records, one simply cannot verify who 20 actually attended the important points of inspection, 21 and it is not satisfactory to rely on one's memory for 22 the purpose of verification. 23 We have also covered the lack of training in this 24 respect. Paragraph 41. Perhaps I will start from 25 paragraph 42. The evidence from Leighton's and MTR's</p>

Page 69	<p>1 staff suggest that they did conduct inspections</p> <p>2 regularly and they in fact spent quite a lot of time</p> <p>3 on site, but unfortunately the relevant defects were not</p> <p>4 picked up by any of them.</p> <p>5 Then we set out our observations as to why the</p> <p>6 hold-point inspections and also the routine inspections</p> <p>7 failed to achieve their intended purposes.</p> <p>8 Paragraph 45 deals with our submissions in relation</p> <p>9 to the training provided by MTR and Leighton to its</p> <p>10 frontline staff. For Leighton, the evidence reveals</p> <p>11 that their frontline engineers, including Henry Lai,</p> <p>12 were not told or trained in how to conduct routine or</p> <p>13 hold-point inspections. They were never given any</p> <p>14 checklist or written instructions on what they should be</p> <p>15 looking for or the areas they should focus on for the</p> <p>16 purpose of those inspections.</p> <p>17 Henry Lai was asked on what basis he conducted the</p> <p>18 routine inspections. I believe that was part of my</p> <p>19 cross-examination. And his answer was:</p> <p>20 "From the basis from my experience gathered from</p> <p>21 previous sites."</p> <p>22 We say this is not satisfactory because at least</p> <p>23 some standard checklists should have been given to the</p> <p>24 frontline engineers, in order to maintain the</p> <p>25 consistency as to what would be expected from such</p>	Page 71	<p>1 that it was pointed out by MTR:</p> <p>2 "More than half of the couplers at the B1 rebar were</p> <p>3 not properly fixed. Your engineer did not rectify the</p> <p>4 defects and decided to cast concrete anyway. It is also</p> <p>5 note[d] that general cleaning inspection was not</p> <p>6 arranged with our IOW before pouring concrete."</p> <p>7 And 52: the Leighton engineer responsible for this</p> <p>8 incident, WC Lam, is not a witness in this Inquiry, but</p> <p>9 Ronald Leung from Leighton gave evidence that he asked</p> <p>10 Mr Lam about the incident and Mr Lam explained that</p> <p>11 there may have been miscommunications with the</p> <p>12 contractors.</p> <p>13 We have also set out in paragraph 53 the</p> <p>14 deficiencies in project management regarding this</p> <p>15 particular issue arising from the VRV unit, and I do not</p> <p>16 wish to repeat them.</p> <p>17 Then breakdown in communication. That is our</p> <p>18 original section F. I understand that there is quite</p> <p>19 a substantial section in Mr Pennicott's closing</p> <p>20 submissions on the breakdown in communication. In fact,</p> <p>21 if one looks at Leighton's COI 2 closing submissions,</p> <p>22 they have already admitted that there was this problem.</p> <p>23 So I will just perhaps highlight a few pieces of</p> <p>24 evidence in this regard.</p> <p>25 Now, first of all, page 38, paragraph 90. We have</p>
Page 70	<p>1 inspections.</p> <p>2 In relation to MTR, there is no system in place to</p> <p>3 inform the frontline construction engineers or</p> <p>4 inspectors of works as to what to check or look for at</p> <p>5 hold points. Kappa Kang, who was responsible for most</p> <p>6 of the rebar inspections at NAT and SAT, gave evidence</p> <p>7 that she had not received training from BOSA and she did</p> <p>8 not know how to determine what constitutes a proper</p> <p>9 splicing assembly.</p> <p>10 When Kappa Kang carried out rebar fixing hold-point</p> <p>11 inspection, she would only look at splicing assemblies</p> <p>12 generally and would not focus particularly on the</p> <p>13 connection between a rebar and a coupler.</p> <p>14 Then we have also heard evidence from Tony Tang, who</p> <p>15 said that when he carried out pre-pour inspection, he</p> <p>16 would not pay attention to the rebars.</p> <p>17 So those are the points that we relied upon to say</p> <p>18 that insufficient training/instruction was given to the</p> <p>19 frontline staff for the purpose of the hold-point</p> <p>20 inspections and also the routine inspections.</p> <p>21 Then paragraph 49. We have made our further</p> <p>22 observation as to why the hold-point inspections system</p> <p>23 was ineffective. Then we have cited an email from MTRCL</p> <p>24 to Leighton, in relation to the air-conditioning -- the</p> <p>25 VRV unit. In the email from MTR to Leighton, we can see</p>	Page 72	<p>1 dealt with the breakdown in communication regarding the</p> <p>2 issue of compatibility of materials, in relation to the</p> <p>3 interface problem, and we have set out the relevant</p> <p>4 interface meetings.</p> <p>5 In fact, despite the existence of a total of about</p> <p>6 22 interface meetings between MTR, Gammon and Leighton,</p> <p>7 the coupler compatibility issue was not followed up or</p> <p>8 brought to the attention of any requisite person at the</p> <p>9 site level.</p> <p>10 As I have said, Leighton admits that there was</p> <p>11 clearly a breakdown or lack of communication.</p> <p>12 Secondly, it emerges from the evidence of MTR's</p> <p>13 witnesses that the frontline staff responsible for</p> <p>14 supervision/inspection of the interface works were not</p> <p>15 familiar with the materials used at the interface.</p> <p>16 Thirdly, it is also clear from the evidence that the</p> <p>17 staff of MTR and Leighton's senior management were not</p> <p>18 informed of the problems which occurred on site until</p> <p>19 a very late stage.</p> <p>20 We have also dealt with the insufficient</p> <p>21 communication between MTR and Leighton, and that has</p> <p>22 been set out in paragraph 104 in our written closing</p> <p>23 submissions. I do not wish to repeat the details here.</p> <p>24 It then brings us to the question regarding</p> <p>25 unauthorised deviation. The Commission will recall that</p>

Page 73	<p>1 that is in relation to the change of the details from</p> <p>2 lapping of rebars to coupler connections.</p> <p>3 We have dealt with the relevant documents regarding</p> <p>4 BD's consultation/acceptance process. I note from the</p> <p>5 experience of COI 1 that perhaps the actual consultation</p> <p>6 process should not form a major issue in this Inquiry,</p> <p>7 so we have set out the relevant letters and also</p> <p>8 procedures just for the sake of completeness.</p> <p>9 But there are a few issues regarding -- perhaps just</p> <p>10 for the Commission's interest, those details are</p> <p>11 actually set out in paragraphs 124 to 127 in our written</p> <p>12 closing.</p> <p>13 But putting aside this issue regarding prior</p> <p>14 consultation, whether prior consultation was required in</p> <p>15 the context of BD's regime, there is a genuine concern</p> <p>16 as to whether the requisite level of</p> <p>17 supervision/inspection had been provided, and also in</p> <p>18 relation to the workmanship of the splicing assemblies.</p> <p>19 Here we are talking about the additional couplers used</p> <p>20 as a result of the change.</p> <p>21 In paragraphs 59 to 64 of our written closing, we</p> <p>22 have summarised and also explained why the necessary</p> <p>23 levels of supervision as required under QSP and also</p> <p>24 RDO's acceptance letters have not been provided for the</p> <p>25 additional couplers. Then we say that the change from</p>	Page 75	<p>1 that also in our closing submissions.</p> <p>2 Finally, I will just very briefly deal with the</p> <p>3 failure to comply with material testing requirements.</p> <p>4 They in fact have been set out at page 44 of our written</p> <p>5 closing, starting from paragraph 108, all the way to</p> <p>6 120. This actually arises from Leighton's admission</p> <p>7 that the use of -- first of all, their admission that</p> <p>8 about 7 per cent of the rebars delivered on site were</p> <p>9 not arranged for sampling and testing, and also they</p> <p>10 admitted in a letter that the use of the untested rebars</p> <p>11 did not fully meet the requirements on material testing</p> <p>12 in CS2. So we say that the failure to test those rebars</p> <p>13 exposed deficiencies in MTR and Leighton's site</p> <p>14 management and quality control system. In fact, no</p> <p>15 evidence has been adduced by MTRCL showing that there is</p> <p>16 any mechanism under PIMS to ensure that all rebars</p> <p>17 delivered on site are tested before the same can be used</p> <p>18 by steel fixers.</p> <p>19 CHAIRMAN: On the testing issue, were figures not, however,</p> <p>20 put forward, which don't deny the failure but which say,</p> <p>21 effectively, that all the testing that did take place</p> <p>22 was -- effectively everything was fine.</p> <p>23 MR KHAW: Yes.</p> <p>24 CHAIRMAN: So when you take that into account and then when</p> <p>25 you take the small amount that weren't tested, it</p>
Page 74	<p>1 lapped bars to couplers also reveals failure to maintain</p> <p>2 proper records. That can be found at paragraph 130, if</p> <p>3 we can just turn to 130 to 136 of our factual closing,</p> <p>4 where we complain that there existed no proper working</p> <p>5 drawings or records showing where the changes were to be</p> <p>6 implemented.</p> <p>7 I wish to, at this juncture, draw your attention to</p> <p>8 the Commission's COI factual closing, paragraphs 242 to</p> <p>9 246, where Mr Pennicott also refers to MTR's contention</p> <p>10 regarding the change from lapped bar to coupler.</p> <p>11 Then Mr Pennicott's team went on to say, in</p> <p>12 paragraph 243:</p> <p>13 "Whether a prior consultation was required ... MTR</p> <p>14 and Leighton ought to have at least complied with the</p> <p>15 minimum requirements contemplated by the government, MTR</p> <p>16 and Leighton for coupler installation at the time,</p> <p>17 including those set out in appendix V [of] the</p> <p>18 acceptance letter ... It would make no sense that while</p> <p>19 MTRCL and Leighton would need to comply with those</p> <p>20 requirements in respect of the original coupler</p> <p>21 installation identified in the accepted drawings,</p> <p>22 they ... would not need to do so in respect of the</p> <p>23 additional couplers that they used in lieu of lapped</p> <p>24 bars."</p> <p>25 In fact we share the same view and we have explained</p>	Page 76	<p>1 reduces down the -- I wouldn't say culpability but it</p> <p>2 reduces down, perhaps, the significance of that failure.</p> <p>3 MR KHAW: Yes. I would say that this could probably be</p> <p>4 taken as a mitigating factor, but when it comes to the</p> <p>5 overall project management for the purpose of overseeing</p> <p>6 that the relevant tests were carried out, what we have</p> <p>7 seen is not good enough. We are hoping that what would</p> <p>8 need to be tested would be tested on site.</p> <p>9 I keep saying the word "finally" but this perhaps</p> <p>10 would be the final topic --</p> <p>11 CHAIRMAN: How was it that certain of those rebars were not</p> <p>12 tested? Again, I remember conversations about people</p> <p>13 putting paint marks on things and various things like</p> <p>14 that. Presumably they would have been delivered, they</p> <p>15 would have been stored, and perhaps just occasionally</p> <p>16 there would have been an oversight in actually testing</p> <p>17 them, because perhaps there were no markings or anything</p> <p>18 of that nature.</p> <p>19 Anyway ...</p> <p>20 MR KHAW: I'm trying to check the reference to Chairman's</p> <p>21 question. If I can have a moment, I will then come back</p> <p>22 to that.</p> <p>23 CHAIRMAN: No, no. Certainly. It's just a passing</p> <p>24 requirement for my memory to be jogged, that's all.</p> <p>25 MR KHAW: Yes. I will come back to that after I finish --</p>

Page 77	<p>1 CHAIRMAN: All right.</p> <p>2 MR KHAW: -- the last part of our factual closing.</p> <p>3 It's in our written closing, actually,</p> <p>4 paragraph 118. In fact, we can start from 117, "On the</p> <p>5 part of Leighton", and then at 118 we say there was</p> <p>6 a colour paint system on site to differentiate tested</p> <p>7 rebars from untested rebars. However, Leighton</p> <p>8 engineers' evidence is that they were not familiar with</p> <p>9 that system.</p> <p>10 CHAIRMAN: Thank you.</p> <p>11 MR KHAW: Perhaps further details can also be found at 105,</p> <p>12 where we say: several Leighton's witnesses gave evidence</p> <p>13 on a colour paint system which was used on site to</p> <p>14 distinguish rebars which have passed the HOKLAS test</p> <p>15 from untested rebars. Joe Tam explained that rebars</p> <p>16 would be sprayed with white paint when they were</p> <p>17 delivered on site. So, when they passed the HOKLAS</p> <p>18 test, they would be sprayed with a different colour.</p> <p>19 So that basically shows the details regarding the</p> <p>20 colour paint system.</p> <p>21 In relation to the last topic, which is about Pypun,</p> <p>22 I note that the main points in Pypun's closing</p> <p>23 submissions have in fact been canvassed in their</p> <p>24 submissions in COI 1. In essence, they are talking</p> <p>25 about the scope of their duties and responsibilities</p>	Page 79	<p>1 the cost will depend on the provisions of the contract</p> <p>2 and any relevant sub-contracts and whether the costs are</p> <p>3 classified as disallowed costs."</p> <p>4 Et cetera. Then 114. Mr Rowsell went on to say:</p> <p>5 "Construction record-keeping ... has an important</p> <p>6 role in relation to maintaining discipline in quality</p> <p>7 assurance procedures and also in supporting contractual</p> <p>8 and commercial decisions. Where work is not undertaken</p> <p>9 correctly and has to be remedied or repeated then</p> <p>10 record-keeping will help to inform decisions by the</p> <p>11 engineer, relating to liability and commercial</p> <p>12 entitlement. The lack of adequate records may in my</p> <p>13 opinion, have an impact on the outcome of claims and</p> <p>14 could impact on the government's commercial position.</p> <p>15 On this basis, record-keeping could have an impact on</p> <p>16 aspects of cost, programme and public safety and should</p> <p>17 in my opinion be a role of the M&V consultant."</p> <p>18 Then finally, regarding the private proactive nature</p> <p>19 of M&V's role, 123 of Mr Rowsell's opinion:</p> <p>20 "At 90 of his witness statement, Mr Yueng states</p> <p>21 that prior to about March 2018, Pypun had no role or</p> <p>22 responsibility to identify, discover or investigate</p> <p>23 issue 1 being considered as part of the Extended</p> <p>24 Inquiry. I do not fully agree with that statement</p> <p>25 because when the problem was discovered, the cause, and</p>
Page 78	<p>1 under the M&V agreement, the question as to whether they</p> <p>2 should be expected to be proactive in doing monitoring</p> <p>3 and verification works, and also their submissions that</p> <p>4 Pypun's performance was considered satisfactory, because</p> <p>5 no complaint was lodged earlier.</p> <p>6 I just wish to point out that we do not wish to</p> <p>7 enter into a debate on contractual interpretation for</p> <p>8 the purpose of this Inquiry, but perhaps it is useful to</p> <p>9 look at Mr Rowsell's COI 2 report which actually</p> <p>10 addresses some of those points made by Pypun. If I can</p> <p>11 just very briefly take Mr Chairman and also</p> <p>12 Mr Commissioner to the relevant sections.</p> <p>13 First of all, on 113, where Mr Rowsell refers to</p> <p>14 Pypun's roles and responsibilities. He said they are</p> <p>15 set out in paragraphs 7 and 8 of the witness statement</p> <p>16 and are repeated frequently in the statement using the</p> <p>17 phrase "cost, programme and public safety". Now,</p> <p>18 there's an issue regarding whether that should cover</p> <p>19 aspects regarding quality of construction works.</p> <p>20 "... Mr Yueng states that these matters are clearly</p> <p>21 unrelated to construction quality or construction</p> <p>22 record-keeping. I do not agree with that statement as,</p> <p>23 in my opinion, poor construction quality leading to the</p> <p>24 need for remedial works could have an impact on the cost</p> <p>25 of the works and also on the programme. Liability for</p>	Page 80	<p>1 hence liability for it, was not known. There was the</p> <p>2 potential, therefore, for the government to face</p> <p>3 significant additional costs and also potential delays</p> <p>4 to the programme ... I consider that it would have been</p> <p>5 reasonable for Pypun to have taken a proactive approach</p> <p>6 and suggested to the government that investigations</p> <p>7 should be made to understand the issues before remedial</p> <p>8 work was undertaken."</p> <p>9 So I believe that those points made by Mr Rowsell</p> <p>10 have addressed the main issues raised by Pypun regarding</p> <p>11 their roles and responsibilities.</p> <p>12 Obviously we acknowledge that Mr Rowsell has also</p> <p>13 made recommendations for the government to consider</p> <p>14 regarding how to improve the arrangements with Pypun and</p> <p>15 also how to, so to speak, encourage the M&V consultants</p> <p>16 to be more proactive in carrying out their duties, and</p> <p>17 in fact in our factual closing for COI 2, we have tried</p> <p>18 to deal with the recommendations provided by Mr Rowsell</p> <p>19 regarding the government's arrangements with Pypun.</p> <p>20 If I can just take you to paragraph 153 of our</p> <p>21 written closing in COI 2. Here we have dealt with the</p> <p>22 recommendations made by Mr Rowsell, regarding extending</p> <p>23 the role of the M&V consultant and also review the</p> <p>24 requirements in relation to site audits and surprise</p> <p>25 checks, the level of monitoring by M&V consultant and</p>

<p style="text-align: right;">Page 81</p> <p>1 the corresponding level of resources. 2 154 sets out what measures we have taken since 3 mid-2018, then measures including those which sought to 4 encourage more proactive involvement of Pypun, by 5 including Pypun in all three-tiered meetings and 6 increasing the frequency of site visits and regular 7 audits by Pypun. We will also consider to further 8 utilise e-platforms to facilitate the sharing of site 9 records of MTR with Pypun so as to ensure that Pypun has 10 the relevant access to relevant and timely information. 11 This is all to ensure that Pypun will have sufficient 12 information for the purpose of taking a proactive role 13 in doing the requisite M&V works. 14 Then regarding site audits and surprise checks, the 15 M&V consultant had carried out on-site checks to verify 16 the extent of missing RISC forms regarding the 17 construction works and the BSRC team also conducted 18 several site audits and surprise checks in addition to 19 the regular site safety inspection checks to the 20 structural works. And the number of site walks 21 conducted by the M&V consultant has also increased. 22 Also, paragraph 158, the Highways Department has 23 also mobilised in-house staff to conduct site surprise 24 checks, and we have mobilised in-house inspectorate 25 staff to be stationed full-time on site at MTR's site</p>	<p style="text-align: right;">Page 83</p> <p>1 recommendations, either measures have been implemented 2 or steps have been taken with a view to implementing 3 those measures. 4 Perhaps there is just one issue I wish to 5 particularly talk about. That is the ongoing monitoring 6 of the station structure. It's item (7) of table A. 7 That has been a recommendation made in the interim 8 report, and we have heard evidence from Dr Glover that 9 in view of the recent discussion on structural 10 engineering evidence, he now has a different view 11 regarding whether such an ongoing monitoring device 12 should be required or not. He suggested that in fact 13 regular site inspections would be preferred to this 14 particular monitoring device. 15 The government remains supportive of the original 16 recommendation in the interim report regarding this 17 ongoing monitoring device. We believe that the 18 Commission's final report on the question of structural 19 integrity could obviously address the public concern in 20 that regard, but we believe that public confidence would 21 also need to stand the test of time. That is why we 22 believe that the implementation of this system would 23 give more assurance to the public if that system would 24 be able to detect any movement during the operational 25 stage of the system.</p>
<p style="text-align: right;">Page 82</p> <p>1 office. Then we have also submitted that we will work 2 together with Pypun in order to identify the areas in 3 which more frequent audits or audits of a wider scope 4 should be carried out. We will also take steps to 5 ensure that Pypun is capable of providing the necessary 6 resources and manpower when they are required to do so. 7 That takes me, perhaps, to the issue of project 8 management that we have dealt with in our closing 9 submissions on expert evidence for COI 1 and COI 2. We 10 have provided three tables for the Commission's 11 consideration. Table A, the first table -- just for the 12 purpose of logistics, the three tables in fact are 13 attached to our COI 2 submissions on experts. Only 14 table A and table B are attached to the COI 1 15 submissions. Table A deals with the recommendations 16 made by the Commission in the interim report. Table B 17 deals with Mr Rowsell's recommendations which have been 18 adopted by the Commission for the purpose of the interim 19 report. And table C deals with the remaining 20 recommendations made by Mr Rowsell in relation to COI 2. 21 We hope that those tables have addressed most, if not 22 all, of the recommendations made by both the Commission 23 and Mr Rowsell. 24 We have also, by way of the tables, tried to 25 demonstrate that in fact, in response to those</p>	<p style="text-align: right;">Page 84</p> <p>1 We note Dr Glover's concern that such a system may 2 sometimes cause false alarms and he doesn't want to 3 cause any unnecessary worry to the public due to those 4 false alarms. We believe that the potential false alarm 5 which could be due to high sensitivity of that device 6 could be minimised by calibration of the device, but 7 it's just a suggestion that we make. Of course, with or 8 without this ongoing monitoring device, it is necessary 9 to have a monitoring system by way of regular site 10 checks or otherwise, in order to ensure public 11 confidence in the structural integrity of the station. 12 Perhaps before I pass the stage to Mr Chow -- sorry 13 that I have used up so much of his time -- just a few 14 points -- 15 CHAIRMAN: Sorry, the question of monitoring. There's 16 monitoring now being done; okay? 17 MR KHAW: (Nodded head). 18 CHAIRMAN: So what you would be look at is no change? In 19 other words, in the final report, we could say it was 20 recommended, it was installed, it has been operating, 21 and it has been operating successfully, and without 22 any -- we don't have to deal with that? 23 COMMISSIONER HANSFORD: It's not installed yet. 24 CHAIRMAN: Ah, so it's not installed. 25 COMMISSIONER HANSFORD: It was a recommendation in our</p>

Page 85	<p>1 interim report.</p> <p>2 MR KHAW: There has been a plan put forward for the</p> <p>3 implementation of the device.</p> <p>4 CHAIRMAN: All right. Sorry.</p> <p>5 MR KHAW: It's actually not running yet.</p> <p>6 CHAIRMAN: Fine.</p> <p>7 MR KHAW: So there will be a question as to whether this</p> <p>8 device should be put in place.</p> <p>9 COMMISSIONER HANSFORD: We understand the point and that's</p> <p>10 a matter for the Commission to consider.</p> <p>11 MR KHAW: Yes.</p> <p>12 COMMISSIONER HANSFORD: Thank you.</p> <p>13 CHAIRMAN: Thank you. Sorry, that's really what I wanted to</p> <p>14 know, whether it was actually now up and running or not.</p> <p>15 MR KHAW: Perhaps just to round up a few points before</p> <p>16 I pass the stage to Mr Chow. In summary, the issues</p> <p>17 that the Commission has considered in COI 1, as</p> <p>18 I discussed earlier, including the alleged rebar cutting</p> <p>19 incidents and also the concern over the quality of the</p> <p>20 coupler connection, et cetera -- as a result, MTR</p> <p>21 proposed the holistic proposal for the purpose of</p> <p>22 verifying the as-constructed conditions of the EWL slab</p> <p>23 to the D-wall connection and also the workmanship issue.</p> <p>24 In fact, the verification proposal was then</p> <p>25 conducted in view of the deficiencies in respect of site</p>	Page 87	<p>1 But I just want to remind ourselves that as a matter</p> <p>2 of fact, all those post-construction structural</p> <p>3 assessments, ie HP and VP, had to be carried out</p> <p>4 because of the failure of MTR and also Leighton to</p> <p>5 properly perform their respective obligations under the</p> <p>6 relevant contracts, ranging from the actual execution of</p> <p>7 the construction works, inspection and supervision, to</p> <p>8 the preparation and keeping of proper records, as</p> <p>9 revealed in the factual evidence.</p> <p>10 While the parties have recently examined the</p> <p>11 question of safety and fitness for purpose from</p> <p>12 a structural engineering perspective, we must not forget</p> <p>13 that one of the terms of reference is to ascertain if</p> <p>14 the works were executed in accordance with the relevant</p> <p>15 contracts.</p> <p>16 CHAIRMAN: Which again is not a detailed analysis of</p> <p>17 contractual liability, but it's to look at what has come</p> <p>18 before, in other words facts and circumstances</p> <p>19 surrounding the work that was done and whether there</p> <p>20 were any problems and issues of safety, and then looking</p> <p>21 at whether all the various requirements within the</p> <p>22 contract, to try and ensure those things were avoided,</p> <p>23 had been complied with.</p> <p>24 MR KHAW: Yes.</p> <p>25 CHAIRMAN: I think the Commission wants to avoid getting</p>
Page 86	<p>1 inspection records, ie RISC forms, et cetera, material</p> <p>2 testing records, and also the design change for the</p> <p>3 structures in NAT, SAT and HHS, for the purpose of</p> <p>4 verifying the as-constructed conditions and also</p> <p>5 workmanship.</p> <p>6 Both the HP and VP do not directly form part of the</p> <p>7 COI, but they were carried out in parallel to the</p> <p>8 conduct of the COI proceedings. Mr Chairman and</p> <p>9 Mr Commissioner would remember that during our</p> <p>10 discussion on the structural integrity issue in COI 1</p> <p>11 closing, I at that time informed the Commission that</p> <p>12 there would be this stage 3 structural assessment, which</p> <p>13 the Commission would need to take into account in due</p> <p>14 course, because there was then a question -- well, there</p> <p>15 was then no indication that there would be a COI 2,</p> <p>16 during the closing of COI 1, but there was then</p> <p>17 a question put to me as to whether it would be premature</p> <p>18 to make any finding on the structural integrity on the</p> <p>19 basis of the evidence available at that time, because</p> <p>20 I once suggested that one could wait a bit, but</p> <p>21 I certainly note and respect the Commission's findings</p> <p>22 in the interim report.</p> <p>23 COMMISSIONER HANSFORD: I should point out, Mr Khaw, they</p> <p>24 were the Commission's interim findings.</p> <p>25 MR KHAW: Yes, of course.</p>	Page 88	<p>1 dragged down into looking at individual things and who</p> <p>2 is to blame vis-a-vis somebody else.</p> <p>3 MR KHAW: Absolutely. We are not looking at blameworthiness</p> <p>4 of any particular individual, and obviously the details</p> <p>5 regarding disputes which may arise from civil disputes</p> <p>6 are not something that we should be concerned with here.</p> <p>7 CHAIRMAN: Yes.</p> <p>8 MR KHAW: We are looking at the broad concepts of the duties</p> <p>9 and responsibilities that one has agreed under the</p> <p>10 circumstances and look at whether what has happened</p> <p>11 actually falls short of the requirements.</p> <p>12 CHAIRMAN: I think that's well put. Yes, thank you.</p> <p>13 MR KHAW: One observation I have is that -- and I will let</p> <p>14 Mr Chow deal with the details -- before one begins to</p> <p>15 comment on the reasonableness and appropriateness of,</p> <p>16 for example, the acceptance criteria or the approach</p> <p>17 adopted in the HP or VP, we must not forget that the HP</p> <p>18 and VP were conducted with a view to ascertaining</p> <p>19 structural integrity and also ensuring quality assurance</p> <p>20 of the structures, in the paramount interests of the</p> <p>21 public.</p> <p>22 But it has been clearly stated in the final reports</p> <p>23 for both structural assessments that the consultant's</p> <p>24 target at that time was to achieve the level of safety</p> <p>25 required under the statute, the code, and also MTR's</p>

Page 89	<p>1 design manual. That was the target at that time.</p> <p>2 It is because when it comes to the question of</p> <p>3 public safety, the government has no other options than</p> <p>4 exercising its judgment out of an abundance of caution,</p> <p>5 and this we say is consistent with the Commission's</p> <p>6 I would say provisional view expressed in the interim</p> <p>7 report that a higher standard of proof for the primary</p> <p>8 issue of structural safety would be adopted, because</p> <p>9 a high assurance of safety is what the public demands.</p> <p>10 But now we have heard evidence from four eminent</p> <p>11 experts on the issues of safety and fitness for purpose.</p> <p>12 From a structural engineering point of view,</p> <p>13 I understand that when the Commission formulated the</p> <p>14 directions regarding structural engineering evidence,</p> <p>15 the Commission may have had in mind the possible</p> <p>16 demarcation between code compliance and safety, fitness</p> <p>17 for purpose from a structural point of view. Obviously</p> <p>18 one accepts that there is a linkage between the two, but</p> <p>19 one can try to analyse the issue of structural safety</p> <p>20 and fitness for purpose from a structural point of view</p> <p>21 which does not strictly adhere to all the requirements</p> <p>22 in relation to code compliance.</p> <p>23 I believe that may be one of the reasons why the</p> <p>24 directions were formulated in such a way.</p> <p>25 All I wish to say is that it is important to</p>	Page 91	<p>1 where those assessments were made.</p> <p>2 COMMISSIONER HANSFORD: I think we understand that.</p> <p>3 MR KHAW: I'm grateful.</p> <p>4 COMMISSIONER HANSFORD: We do.</p> <p>5 MR KHAW: That perhaps completes what I intended to submit.</p> <p>6 Thank you, Chairman. I wonder whether we should just</p> <p>7 plough on?</p> <p>8 CHAIRMAN: It's five past one.</p> <p>9 MR PENNICOTT: I don't think so!</p> <p>10 MR CHOW: I wouldn't recommend that.</p> <p>11 MR KHAW: It was not a genuine invitation, actually!</p> <p>12 COMMISSIONER HANSFORD: How long do we expect Mr Chow to be?</p> <p>13 MR CHOW: Prof Hansford, I think my submission will take</p> <p>14 about one to one and a half hours, because there are</p> <p>15 some important details I would like to make sure the</p> <p>16 Commission --</p> <p>17 CHAIRMAN: All right. We can start again at 2.00.</p> <p>18 MR CLAYTON: May I just say I have indicated to Mr Pennicott</p> <p>19 that my submissions will only take about 15 minutes, and</p> <p>20 we are in the programme for an hour, so that might</p> <p>21 assist a little bit.</p> <p>22 MR PENNICOTT: Yes. I was about to stand up and say that</p> <p>23 Mr Clayton had given me that indication earlier. So,</p> <p>24 sir, can we compromise and say 2.15? Shall we do that?</p> <p>25 CHAIRMAN: All right. Then I don't know if anybody has any</p>
Page 90	<p>1 recognise that the nature and the purpose of the</p> <p>2 analysis provided by the experts in these proceedings,</p> <p>3 when they talk about their views from a structural</p> <p>4 engineering point of view, may not be the same as those</p> <p>5 concerning the assessments under the HP and the VP,</p> <p>6 because we all know that at that time our target was to</p> <p>7 bring the level of safety back to what is actually</p> <p>8 required under the statute, the code and also the design</p> <p>9 manual.</p> <p>10 So if one now accepts, for example, Prof McQuillan's</p> <p>11 view -- and Prof McQuillan, for example, takes the view</p> <p>12 that the acceptance criteria could be lower or the</p> <p>13 acceptance criteria for, for example, coupler connection</p> <p>14 was set too high during the structural assessments for</p> <p>15 HP and VP -- it does not necessarily follow that the</p> <p>16 assumption, the analysis made in the HP and VP could not</p> <p>17 be justified or they are unreasonable, because we are</p> <p>18 talking about different structural assessments for</p> <p>19 different purposes.</p> <p>20 I just wish to issue perhaps a notice of caution</p> <p>21 that when one is trying to deal with the comments as to</p> <p>22 whether our acceptance criteria or our assumption made</p> <p>23 in those structural assessments, ie HP and VP, are</p> <p>24 unreasonable or are, in some of the submissions I have</p> <p>25 seen, flawed, one has to take this back to the context</p>	Page 92	<p>1 important meetings that require them to leave at exactly</p> <p>2 our normal closing, so we could perhaps edge over into</p> <p>3 a later time.</p> <p>4 MR PENNICOTT: I think the position looks as though it's</p> <p>5 panning out like this, that if Mr Chow sticks to his</p> <p>6 maximum one and a half hours, and then Mr Clayton is</p> <p>7 15 minutes, it may be that we can make a start with the</p> <p>8 MTR this afternoon, but depending upon precisely where</p> <p>9 we have reached. But even so, even if we don't start</p> <p>10 with the MTR this afternoon, unless Mr Boulding is</p> <p>11 suddenly going to say he wants three hours, like the</p> <p>12 government, I'm still very confident we are going to</p> <p>13 finish tomorrow in any event, so I don't think it</p> <p>14 matters.</p> <p>15 CHAIRMAN: All right. Good. I can understand why everybody</p> <p>16 would like, if possible, to try to get things finished</p> <p>17 tomorrow.</p> <p>18 MR PENNICOTT: Yes.</p> <p>19 CHAIRMAN: Efficiency dictates it, in any event.</p> <p>20 MR PENNICOTT: Yes, and we shall.</p> <p>21 COMMISSIONER HANSFORD: My flight is not until midnight on</p> <p>22 Friday. I'm happy for Friday morning if necessary.</p> <p>23 MR PENNICOTT: Mine is at 5.10 on Friday.</p> <p>24 CHAIRMAN: Good. So we are going to make it 2.15. Thank</p> <p>25 you very much.</p>

Page 93	Page 95
<p>1 (1.08 pm)</p> <p>2 (The luncheon adjournment)</p> <p>3 (2.19 pm)</p> <p>4 MR KHAW: Mr Chairman, just one correction to make. Before</p> <p>5 lunch, in response to Chairman's question regarding the</p> <p>6 long-term monitoring device, I told the Commission that</p> <p>7 there was a plan but the device has not started to run</p> <p>8 yet.</p> <p>9 In fact, I have clarified the position with my</p> <p>10 clients, and as of last week we were still writing to</p> <p>11 MTR requesting for submissions regarding that plan, so</p> <p>12 the plan has not yet materialised.</p> <p>13 So that is the updated position.</p> <p>14 CHAIRMAN: Very good. That actually is of some assistance,</p> <p>15 because in making a decision, if we were to make it on</p> <p>16 the basis of a change, it wouldn't mean dismantling,</p> <p>17 hopefully, a whole lot of stuff. I'm not suggesting we</p> <p>18 will go that way, but either way it makes it easier.</p> <p>19 MR KHAW: Yes. The possible disruptions may not be that</p> <p>20 substantial.</p> <p>21 CHAIRMAN: All right. Thank you.</p> <p>22 Closing statement by MR CHOW</p> <p>23 MR CHOW: Good afternoon, Mr Chairman and Prof Hansford.</p> <p>24 Five specific structural issues were identified and</p> <p>25 dealt with by the expert in this Inquiry. Three of them</p>	<p>1 to go into some details regarding the configuration of</p> <p>2 the couplers and the threaded bars, as well as the</p> <p>3 proper method of installation.</p> <p>4 To put the matter in perspective, the first point</p> <p>5 I would like to make is, first of all, it was MTR's</p> <p>6 designer who specified the use of couplers as a splicing</p> <p>7 device. It is not the government who specified the use</p> <p>8 of couplers.</p> <p>9 Then if we look at the drawings, MTR's designer</p> <p>10 actually did not specify the brand of couplers to be</p> <p>11 used. It was up to the contractor to propose which</p> <p>12 particular brand of couplers to be used. In this</p> <p>13 instance, it was Leighton who proposed the use of BOSA's</p> <p>14 couplers. BOSA's couplers is a proprietary product. It</p> <p>15 is not new in Hong Kong because the same kind of</p> <p>16 couplers had been used in many other projects in</p> <p>17 Hong Kong. Just to give the reference, there is some</p> <p>18 evidence showing the relevant job references. It is in</p> <p>19 bundle A1, page 654 to 663.</p> <p>20 In proposing the use of BOSA couplers, Leighton</p> <p>21 actually submitted a number of technical documents to</p> <p>22 the government through MTR, and some of those documents</p> <p>23 are rather important for the understanding of what were</p> <p>24 really the requirements from these proprietary products'</p> <p>25 suppliers. One of those documents is the QSP, the</p>
Page 94	Page 96
<p>1 relate to the underground station box structure. They</p> <p>2 are first of all the partially engaged coupler</p> <p>3 connections, the shear capacity of the platform slab and</p> <p>4 the construction joint at the connection between the EWL</p> <p>5 slab and the diaphragm wall.</p> <p>6 The fourth issue relates to the shear capacity of</p> <p>7 the NSL slab of the South Approach Tunnel only, and the</p> <p>8 last issue concerns the structural capacity of the</p> <p>9 trough walls in the siding area.</p> <p>10 There are actually two fundamental disagreements or</p> <p>11 disputes involved in the experts' respective assessment.</p> <p>12 The first fundamental issue is whether the strength of</p> <p>13 the partially engaged couplers in the structure should</p> <p>14 be taken into account in structural assessment. The</p> <p>15 second common issue is in the light of the extensive</p> <p>16 non-compliances that we discovered at the soffit of the</p> <p>17 EWL slab, whether it is proper that the contribution of</p> <p>18 the shear links that may exist in the platform slab or</p> <p>19 the other slab in the South Approach Tunnel should be</p> <p>20 ignored in structural assessment.</p> <p>21 The issue about the partially engaged couplers is,</p> <p>22 if I may say so, far more important. A lot of evidence</p> <p>23 was adduced and a lot of time was spent on this issue.</p> <p>24 It also affects the argument over the strength of the</p> <p>25 trough walls in the siding area. As such, I would like</p>	<p>1 quality supervision plan, and also the specification on</p> <p>2 couplers' installation method, the measurement of thread</p> <p>3 length and guidelines for visual inspection.</p> <p>4 The first document I would like to quickly refer the</p> <p>5 Commission to, which is at bundle A1/595, which is part</p> <p>6 of the specification, showing the configuration of the</p> <p>7 couplers that we are talking about. Yes, right.</p> <p>8 What I would like the Commission to take particular</p> <p>9 note of from this document is, if we look at the first</p> <p>10 column, which shows the various bar sizes, if we go down</p> <p>11 to the one with 40mm diameter bar size, and then we</p> <p>12 check the third column, 88 millimetres is the length of</p> <p>13 the couplers. This is an important figure. When</p> <p>14 I later on explain why the acceptance criteria is set in</p> <p>15 the way that it was, this is an important figure.</p> <p>16 Then another important figure is if we look at the</p> <p>17 fourth column from the left, which is the tolerance, it</p> <p>18 indicates that for 40mm diameter bar, the corresponding</p> <p>19 tolerance is 4mm. If you look at the bottom figure, it</p> <p>20 shows that -- now, first of all, it shows the dimension</p> <p>21 of the couplers, which is 2t, in other words it's 88mm,</p> <p>22 and it also shows the length of the thread of the</p> <p>23 corresponding reinforcement as t plus the tolerance.</p> <p>24 In other words, according to this document, there</p> <p>25 must be some tolerance allowed in the threading process,</p>

Page 97	<p>1 not just t but also plus a tolerance.</p> <p>2 Then we will move on to look at what the tolerance</p> <p>3 should be.</p> <p>4 COMMISSIONER HANSFORD: Just to be clear, it's plus or minus</p> <p>5 the tolerance, isn't it? Because the left-hand one</p> <p>6 shows plus the tolerance and the right-hand side shows</p> <p>7 minus the tolerance.</p> <p>8 MR CHOW: In this document, it is shown like that, but in</p> <p>9 other documents and also other evidence, it shows that</p> <p>10 the tolerance is always positive. It's always positive.</p> <p>11 I will come to that.</p> <p>12 COMMISSIONER HANSFORD: But this shows negative.</p> <p>13 MR CHOW: That is what's shown here, but we can look at</p> <p>14 another document to see.</p> <p>15 Then I would like to refer the Commission to the</p> <p>16 guidelines for visual inspection, at page 594, just the</p> <p>17 page before, I believe. Yes.</p> <p>18 This is the guidelines for visual inspection, and</p> <p>19 under clause 3, point 3, under "Summary", it states:</p> <p>20 "Under normal circumstances, we provide a positive</p> <p>21 tolerance of half a thread."</p> <p>22 In other words, as we know, the length of one thread</p> <p>23 is 4mm, so half a thread means there will be, under</p> <p>24 normal circumstances, 2mm as the extra length.</p> <p>25 In other words, under normal circumstances, one</p>	Page 99	<p>1 they fix the steel cages for the diaphragm wall, they</p> <p>2 will have to do that, to ensure that, first of all, the</p> <p>3 couplers have to be fully screwed into the first bar and</p> <p>4 then properly protected with a plastic cap.</p> <p>5 Then step 4 is the steel fixer. In our case it's</p> <p>6 the steel fixers for the platform slab, so what the</p> <p>7 second group of steel fixers do is: first of all, they</p> <p>8 have to position the continuation bar, to remove both</p> <p>9 protective cap on the bar and the coupler, and to fully</p> <p>10 engage the thread using hand to the coupler. This</p> <p>11 should develop full tensile strength of the splice once</p> <p>12 fully engaged.</p> <p>13 Then we have step 5. Actually, step 5 is mentioned</p> <p>14 by one of our experts, giving his opinion as to how the</p> <p>15 situation can be improved in future. Actually, this is</p> <p>16 already set out in BOSA's installation requirement.</p> <p>17 It's to use a typical pipe wrench to tighten the splice.</p> <p>18 It also specifies that no special torque amount is</p> <p>19 required.</p> <p>20 So, basically, this is the requirement.</p> <p>21 COMMISSIONER HANSFORD: Sorry, I'm not sure that was quite</p> <p>22 correct, because the experts' response was to me, when</p> <p>23 I was asking about suggestions for making proper</p> <p>24 connections, and if you recall I asked that laboriously</p> <p>25 to all four experts.</p>
Page 98	<p>1 would expect that the threaded bar to be produced by</p> <p>2 BOSA would be 46mm.</p> <p>3 Then we can now go to take a look at the method of</p> <p>4 installation at page 590. Sir, this is the requirement</p> <p>5 from BOSA as to how these coupler assemblies should be</p> <p>6 installed. Under step 1, basically, it describes that,</p> <p>7 as we have heard from the factual evidence, BOSA has</p> <p>8 a factory installed on site at the time, and then BOSA</p> <p>9 will thread the bars.</p> <p>10 Then step 2: at the same time, in BOSA's fabrication</p> <p>11 yard, BOSA fabricators will screw on the couplers by</p> <p>12 hand to one end of the threaded bars. In other words,</p> <p>13 under step 2, whatever is the threaded length of the</p> <p>14 first bar, it will be fully screwed into the couplers.</p> <p>15 Then, under step 3, when the bars are being erected</p> <p>16 on site, it will be done by steel fixers. What it</p> <p>17 requires here is the steel fixer has to ensure the</p> <p>18 coupler is fully screw into the bar prior to being cast</p> <p>19 in concrete, and at the same time to ensure the</p> <p>20 protective cap is still intact and fitted on coupler end</p> <p>21 to prevent ingress of foreign material.</p> <p>22 In step 3, we haven't come to a stage where the</p> <p>23 continuation bars are going to be screwed into the</p> <p>24 couplers. If we take what happened in this job site,</p> <p>25 under step 3, basically Intrafor's steel fixers, when</p>	Page 100	<p>1 MR CHOW: Yes, you did.</p> <p>2 COMMISSIONER HANSFORD: And the one that made the</p> <p>3 suggestion, which he said is the same as step 5,</p> <p>4 actually suggested that you could apply a torque and</p> <p>5 specify a torque.</p> <p>6 MR CHOW: Yes.</p> <p>7 COMMISSIONER HANSFORD: So it wasn't quite the same as</p> <p>8 step 5, because it says, "Use a typical pipe wrench ...</p> <p>9 No torque required".</p> <p>10 MR CHOW: Quite correct. This coincides with my</p> <p>11 recollection as well. The point I was trying to make is</p> <p>12 when the expert, as part of his suggestion to the</p> <p>13 Commission, to have the workers -- to ensure the</p> <p>14 threaded bar is properly tightened, to use a pipe</p> <p>15 wrench, and for that part, it's actually something</p> <p>16 already set out in the standard installation procedures.</p> <p>17 COMMISSIONER HANSFORD: But he then went on to say his</p> <p>18 recommendation would be you specify a torque.</p> <p>19 MR CHOW: Yes, but as I understand it, whether torque is</p> <p>20 required and if so what sort of torque that needs to be</p> <p>21 applied depends on the type of couplers as well. So to</p> <p>22 that extent I would say that if the proprietary product</p> <p>23 supplier indicates that for these particular products</p> <p>24 they don't need to apply a torque, I think we can focus</p> <p>25 on this particular case is to ensure the workers use</p>

Page 101	<p>1 a pipe wrench to properly tighten the threaded bars into 2 the couplers.</p> <p>3 The next document I would like to take the 4 Commission to is part of the QSP. Bundle H9/4265. The 5 particular page is 4276. That sets out what a quality 6 control supervisor of Leighton has to do in relation to 7 his supervision. The requirement under 3 says that the 8 thread or the couplers must be checked for my existence 9 of concrete gal, debris and foreign material. If any of 10 these exist, then it must be cleaned prior to 11 installation and tightening.</p> <p>12 COMMISSIONER HANSFORD: Do you know what concrete gal means? 13 MR CHOW: Honestly, I have checked and I'm not sure it is 14 the correct -- 15 COMMISSIONER HANSFORD: I have never heard of it. 16 MR CHOW: Neither do I, but this is what is set out in the 17 document. 18 COMMISSIONER HANSFORD: How can you check for the existence 19 of something that you don't know what it is? 20 MR CHOW: Perhaps it's something that sticks onto -- got 21 into -- either inside the couplers or stick onto the 22 thread. 23 COMMISSIONER HANSFORD: I read that before and I wondered 24 what it is. 25 CHAIRMAN: Somebody needs to quickly call up Siri using</p>	Page 103	<p>1 the threaded bars should be of a threaded length of 2 46 millimetres, then the point inside the couplers where 3 the two bars meet normally would not be at midpoint. It 4 would be at 46 millimetres from one end.</p> <p>5 Now, of course, where it meets depends on the thread 6 length of the first bar. According to the installation, 7 the first one has to be -- the coupler has to be fully 8 screwed into the first one.</p> <p>9 In paragraph 49(5) of our closing, we have prepared 10 a table. What we are trying to do is to -- 11 paragraph 49(5) of our written closing submission, 12 please. Under subparagraph (5), we have prepared 13 a table. What we are trying to do is to demonstrate how 14 the number of threads exposed at the other end depends 15 on the respective thread length of the two reinforcing 16 bars in question.</p> <p>17 Under the first column, we set out the three 18 possibilities. Just now we have looked at the minimum, 19 44 millimetre threaded length, plus the tolerance which 20 may go up to 4 millimetres, so we set out three 21 possibilities. It's either 44 -- 46mm according to BOSA 22 should be -- under normal circumstances, most of the 23 bars should be 46 millimetres. And the other extreme is 24 48.</p> <p>25 Now, the next column, we set out the point where the</p>
Page 102	<p>1 their mobile and say "What is a gal?"</p> <p>2 MR CHOW: Somebody suggested perhaps what it means is 3 concrete gel, but even with concrete gel, I'm not sure 4 it makes sense.</p> <p>5 COMMISSIONER HANSFORD: I don't know what concrete gel is, 6 either.</p> <p>7 MR CHOW: Anyway, I think the important point is to ensure 8 that any foreign materials that got inside the couplers 9 or are sticking on the thread have to be cleaned before 10 the steel fixer screws the threaded bars into the 11 couplers.</p> <p>12 The point I would like to make here is first of all 13 we observe this is a document produced by Leighton, so 14 Leighton must be aware of the requirement, and the 15 document we have to look at actually was part of the 16 technical and quality assurance manual of BOSA, and 17 these documents were submitted by Leighton through MTR 18 as well. So Leighton ought to be aware of all these 19 details, in particular every step for a proper 20 installation of the coupler assembly.</p> <p>21 So if the threaded length of the rebar supplied by 22 BOSA is as what BOSA specified in the specification, and 23 if Leighton steel fixers properly carried out the 24 installation work as per the method of installation we 25 have just looked at, under normal circumstances most of</p>	Page 104	<p>1 bars would meet inside the couplers, so depending on the 2 thread length of the first bar, if it is 44, given that 3 the length of the couplers is 88, then the bar will meet 4 at the midpoint. If it is longer than 44, then where it 5 meets will be slightly towards the other end. The third 6 column then calculates the remaining length inside the 7 coupler that is left for the continuation bar.</p> <p>8 So again, if the first bar is of a thread length of 9 44, one would expect that the remaining length inside 10 the coupler would be 44, and if it is 48, then the 11 remaining space would be only 40.</p> <p>12 The fourth column from the left, I set out the 13 various possibilities for the threaded length of the 14 continuation bar. And the last column, depending on the 15 length of the threads of the continuation bar, is the 16 number of threads that we expect would be exposed. Now, 17 we will see from this table that depending on the thread 18 lengths of the two bars involved in the connection, then 19 one would expect that the number of threads exposed 20 would vary from either no threads exposed, which is 21 zero, or maximum two threads exposed; right?</p> <p>22 That explains why -- or tries to understand the 23 guidelines for visual inspection set out by BOSA in the 24 guidelines, figures.</p> <p>25 If we may then go back to page 594 of bundle A1.</p>

Page 105	Page 107
<p>1 This is the famous figures, the guidelines, which we</p> <p>2 have referred to many times in the past. In these</p> <p>3 guidelines, under item 1, it states:</p> <p>4 "After connection has been fully tightened, one</p> <p>5 should see a maximum of TWO FULL THREADS to ensure</p> <p>6 a proper installation."</p> <p>7 Sir, as I have explained earlier, these guidelines</p> <p>8 only provide a maximum allowable number of threads</p> <p>9 exposed. It doesn't say that all the steel fixers need</p> <p>10 to do is to ensure that as soon as you screw the</p> <p>11 threaded bar in, as long as you don't see more than two</p> <p>12 threads, then you can stop. It doesn't say that,</p> <p>13 because according to the installation method, you need</p> <p>14 to properly tighten it. Once you tighten it, depending</p> <p>15 on the thread length, the number of threads exposed</p> <p>16 depending on the thread length, not depending on -- in</p> <p>17 other words, you are not supposed to stop screwing your</p> <p>18 threaded bar as soon as you see only two threads</p> <p>19 exposed.</p> <p>20 CHAIRMAN: I'm sure that's right, that common sense would</p> <p>21 dictate that, but if it says you should see a maximum of</p> <p>22 two full threads to ensure a proper installation, and</p> <p>23 it's not, say, like a screwdriver going into the inside</p> <p>24 of a bedroom cupboard door which is then going to</p> <p>25 scratch you or something if it's not flush, surely the</p>	<p>1 not there at the time when the threaded bar was screwed</p> <p>2 in, he won't be able to know whether they were properly</p> <p>3 tightened, so they need to have some sort of objective</p> <p>4 indication as to help them to decide whether the</p> <p>5 threaded bars were properly tightened, and they were</p> <p>6 told, "You have to make sure not more than two threads</p> <p>7 exposed."</p> <p>8 CHAIRMAN: All right, but does anything turn on this?</p> <p>9 Because what you've got here is BOSA saying, "If you see</p> <p>10 a maximum of two full threads, then you've got proper</p> <p>11 installation", and the workmen say, "We went to school,</p> <p>12 we were taught, we had our assemblies and we were</p> <p>13 taught: two full threads." So the workmen weren't</p> <p>14 ignorant of this.</p> <p>15 COMMISSIONER HANSFORD: The workmen were in fact instructed</p> <p>16 by BOSA.</p> <p>17 MR CHOW: The evidence shows that BOSA arranged a training</p> <p>18 session for the inspector and the workers as well, and</p> <p>19 I can't recall whether the training session also covers</p> <p>20 the installation method. I would suppose that it must</p> <p>21 be part of the training process. If it doesn't, I would</p> <p>22 say that it is the responsibility of the main contractor</p> <p>23 to ensure that their workers know exactly how to</p> <p>24 properly install the coupler connections.</p> <p>25 My respectful submission is that what the workers</p>
Page 106	Page 108
<p>1 installing team could say, "There we are, two threads,</p> <p>2 leave it at that"?</p> <p>3 MR CHOW: Sir, up to now, it seems to me that we take it</p> <p>4 that these figures showing the visual inspection is</p> <p>5 meant to be followed by the workers, but if you look at</p> <p>6 the matter in reality, this, in my respectful</p> <p>7 submission, is supposed to be looked at and followed by</p> <p>8 the inspector, not by the workers. All the workers are</p> <p>9 supposed to be trained, properly trained, by their</p> <p>10 supervisor, and the training involves the five steps</p> <p>11 that we have looked at. So the workers, as long as they</p> <p>12 follow the steps, then they don't need to worry about</p> <p>13 the number of threads exposed after they have -- if they</p> <p>14 consider they have fully screwed their threaded bar in</p> <p>15 it. The visual inspection is for someone who has not --</p> <p>16 CHAIRMAN: Sorry, you have lost me there. Can you give me</p> <p>17 that again? As far as the workers are concerned, they</p> <p>18 don't have to worry about how many threads are showing.</p> <p>19 MR CHOW: They just follow the method of installation to</p> <p>20 properly tighten the threaded bar.</p> <p>21 CHAIRMAN: Okay, so that's what they do, and then the visual</p> <p>22 inspector or the inspector, he then checks to see if</p> <p>23 it's fully tightened or if there's a maximum of two</p> <p>24 threads?</p> <p>25 MR CHOW: Yes, because the inspector -- if the inspector was</p>	<p>1 have to be trained is the five steps, because those are</p> <p>2 the more important part of the requirement: to ensure</p> <p>3 that there is no foreign objects in the couplers, they</p> <p>4 have to tighten it every time. Once they have done</p> <p>5 that, then they don't need to worry about how many</p> <p>6 threads exposed at the end, because the natural</p> <p>7 consequence of that operation would be there won't be</p> <p>8 more than two threads exposed, on the condition that the</p> <p>9 couplers and the threaded bars were manufactured and</p> <p>10 supplied by BOSA, in accordance with what they say in</p> <p>11 the specification.</p> <p>12 COMMISSIONER HANSFORD: With the greatest of respect,</p> <p>13 Mr Chow, this seems to be a little bit like post-event</p> <p>14 rationalisation. The evidence we received, I think, is</p> <p>15 that the workers were under the impression that provided</p> <p>16 there were no more than two threads exposed, then the</p> <p>17 installation was acceptable.</p> <p>18 MR CHOW: Prof Hansford, if the training only covered that</p> <p>19 much, then obviously there is some problem with the</p> <p>20 training process.</p> <p>21 What I am trying to do here is to rationalise the</p> <p>22 guidelines with the specification, to suggest that in</p> <p>23 itself there is no incompatibility between the visual</p> <p>24 inspection guidelines and the method of installation.</p> <p>25 COMMISSIONER HANSFORD: That's what I meant by post-event</p>

Page 109	Page 111
<p>1 rationalisation.</p> <p>2 MR CHOW: Yes.</p> <p>3 Sir, then Leighton, being the main contractor for</p> <p>4 the work and the proposer for the use of the BOSA</p> <p>5 splicing system, ought to ensure that, firstly, the</p> <p>6 threaded length of the bars produced by BOSA were as</p> <p>7 specified, in other words ranging from 44mm to 48mm, and</p> <p>8 in normal circumstances mostly should be 46mm. And also</p> <p>9 Leighton ought to ensure that the steel fixers --</p> <p>10 CHAIRMAN: Sorry, are we talking the same language as</p> <p>11 Prof McQuillan?</p> <p>12 MR PENNICOTT: No, we are definitely not.</p> <p>13 MR CHOW: Yes, I will come to that.</p> <p>14 CHAIRMAN: This is the problem, because Prof McQuillan spoke</p> <p>15 about 48 and said that he didn't see anything other than</p> <p>16 48s.</p> <p>17 MR CHOW: No, 44.</p> <p>18 CHAIRMAN: 44, I'm sorry.</p> <p>19 MR CHOW: Prof McQuillan said he had never seen anything</p> <p>20 more than 44.</p> <p>21 CHAIRMAN: Yes.</p> <p>22 COMMISSIONER HANSFORD: And he had certainly never seen</p> <p>23 a 48. That was the evidence we received.</p> <p>24 MR CHOW: I also note what Prof McQuillan said. My response</p> <p>25 is that we -- Chairman, you will recall that recently we</p>	<p>1 manufactured in a site fabrication yard. I don't know</p> <p>2 whether Prof McQuillan went to the site fabrication</p> <p>3 yard, but probably not, because we also have evidence to</p> <p>4 suggest that prior to 2019 the fabrication yard on site</p> <p>5 has been removed. I vaguely recall this piece of</p> <p>6 evidence.</p> <p>7 But what we can better rely on, actually, is someone</p> <p>8 who is supposed to have personal knowledge of what</p> <p>9 happened on site. First we have Mr Neil Ng from MTRC,</p> <p>10 the project manager of MTRC. He also gave evidence and</p> <p>11 he confirmed that 44 usually, sometimes one more thread.</p> <p>12 And also Paulino who actually gave the training to the</p> <p>13 workers, and when he was giving evidence no doubt he was</p> <p>14 referring to the coupler assembly fabricated by BOSA for</p> <p>15 this particular job site.</p> <p>16 In our written closing submissions, we have included</p> <p>17 the bundle references and where we can find from the</p> <p>18 transcript or the evidence of Mr Paulino Lim and</p> <p>19 Mr Neil Ng, and I do not intend to take the Commission</p> <p>20 to those details at this point, unless, Chairman, you</p> <p>21 want me to do so.</p> <p>22 CHAIRMAN: No, that's all right. Thank you very much.</p> <p>23 MR CHOW: As far as MTRC is concerned -- sorry, I haven't</p> <p>24 finished with the duty of Leighton. Other than to</p> <p>25 ensure that the thread lengths of the rebars produced by</p>
Page 110	Page 112
<p>1 have heard evidence from one Mr Chow from Leighton who</p> <p>2 came forward to testify and informed the Commission that</p> <p>3 in early 2019, Leighton has placed order for a number of</p> <p>4 coupler assemblies, and it's for the purpose of testing.</p> <p>5 CHAIRMAN: Yes.</p> <p>6 MR CHOW: I think in response to some cross-examination by</p> <p>7 my learned friend Mr Pennicott, he confirmed that those</p> <p>8 further coupler assemblies for testing were not part of</p> <p>9 the original lot of coupler assemblies used on site.</p> <p>10 So, in relation to what Prof McQuillan observed,</p> <p>11 I don't see, unless what Prof McQuillan observed are the</p> <p>12 original coupler assemblies used on site, then otherwise</p> <p>13 the natural inference is -- because as soon as</p> <p>14 Prof McQuillan was involved, we see that we have a lot</p> <p>15 of new or further coupler assemblies specifically made</p> <p>16 for the purpose of testing -- it may not be the same</p> <p>17 coupler assemblies that the people used on site. Now --</p> <p>18 COMMISSIONER HANSFORD: The problem we have, of course, is</p> <p>19 that Prof McQuillan is not here to be cross-examined on</p> <p>20 that at the moment.</p> <p>21 MR CHOW: No.</p> <p>22 COMMISSIONER HANSFORD: But he did tell us, of course, that</p> <p>23 he went to the BOSA factory and saw typical bars --</p> <p>24 MR CHOW: I don't know if -- the evidence is that for the</p> <p>25 coupler assemblies used on site, it was threaded and</p>	<p>1 BOSA were specified, Leighton has to also ensure that</p> <p>2 the steel fixers were properly trained for the</p> <p>3 installation work and made aware of the requirements of</p> <p>4 BOSA.</p> <p>5 During the execution of the coupler connection work,</p> <p>6 Leighton was also required to provide full-time and</p> <p>7 continuous supervision to ensure that steel fixers</p> <p>8 performed the work in accordance with the method of</p> <p>9 installation that we have just looked at.</p> <p>10 As far as MTR is concerned, being the project</p> <p>11 manager of the work, with a responsibility to supervise</p> <p>12 the construction work generally on site, we respectfully</p> <p>13 submit that they ought to ensure the couplers supplied</p> <p>14 by the threaded bars produced by BOSA are in compliance</p> <p>15 with BOSA's technical and quality assurance manual, in</p> <p>16 other words all the details that we have just looked,</p> <p>17 with thread length ranging from 44 to 48 and mostly 46.</p> <p>18 Now, if the threaded bars used and delivered to site</p> <p>19 does not or did not conform to this specification, then</p> <p>20 it is for MTR to point it out, for Leightons to do</p> <p>21 something with BOSA immediately, because according to</p> <p>22 the specification they should not be producing threaded</p> <p>23 bars with a threaded length of only 44. According to</p> <p>24 the specification, it should be mostly 46, and there is</p> <p>25 a reason for it: because according to the whole</p>

Page 113	Page 115
<p>1 philosophy, the extra tolerance is for the purpose of</p> <p>2 ensuring that after proper tightening, then it will be</p> <p>3 butt-to-butt inside; right?</p> <p>4 Later on, I will explain, actually butt-to-butt</p> <p>5 requirement is not part of our acceptance criteria.</p> <p>6 CHAIRMAN: Sorry, so it should not be 44, it should be</p> <p>7 mostly 46?</p> <p>8 MR CHOW: Yes. It should range from 44 to 46. If what</p> <p>9 Prof McQuillan said was right, in other words all the</p> <p>10 threaded bars delivered to site was only of a length of</p> <p>11 44 millimetres, then someone has to modify the</p> <p>12 inspection criteria of "no more than two threads</p> <p>13 exposed", because in that situation, if all the threaded</p> <p>14 bar is only 44, then for the purpose of inspection one</p> <p>15 should expect no thread exposed.</p> <p>16 What I'm trying to say is that as a main contractor</p> <p>17 and as a project manager, having the responsibility of</p> <p>18 supervising the work, if at the time the threaded length</p> <p>19 of the bar delivered to site is not, as what BOSA said,</p> <p>20 mostly 46, then someone has to do something about it,</p> <p>21 either to get BOSA to produce threaded bars with the</p> <p>22 proper threaded length, with tolerance, or modify the</p> <p>23 visual inspection guidelines from not more than two</p> <p>24 threads exposed to no threads exposed, for the purpose</p> <p>25 of inspection.</p>	<p>1 shining, is a very difficult thing to do, unless you</p> <p>2 have them all pre-marked.</p> <p>3 MR CHOW: Chairman, I'm not suggesting that the workers or</p> <p>4 the steel fixers doing the fixing work have to measure</p> <p>5 for each and every steel bar.</p> <p>6 CHAIRMAN: Right.</p> <p>7 MR CHOW: What I am suggesting is that, as the main</p> <p>8 contractor, you have a supervisor on site in charge of</p> <p>9 the work. If a whole lot of threaded bars delivered to</p> <p>10 site, it is easy enough to get someone to pick a few and</p> <p>11 just measure it, not in a dusty environment, because we</p> <p>12 have the fabrication yard on site and we have seen</p> <p>13 photos, when the threaded bars were produced, it was in</p> <p>14 a very clean condition and protected with caps. Now, as</p> <p>15 a quality control or as an acceptance inspection, when</p> <p>16 one buys something, purchases something, where the</p> <p>17 materials are delivered to site, it is the</p> <p>18 responsibility for the main contractor at least to check</p> <p>19 whether the materials delivered and produced by the</p> <p>20 supplier coincide with what they said they are going to</p> <p>21 sell. So if a whole lot of --</p> <p>22 CHAIRMAN: I appreciate that. Can you assist me here,</p> <p>23 because I think this is where I'm obviously wrong.</p> <p>24 I had assumed that the reason why it could go -- the</p> <p>25 threaded length could go from, say, 44 up to 48 was</p>
Page 114	Page 116
<p>1 CHAIRMAN: All right. Can you help me? I'm a words person,</p> <p>2 not a numbers person. Can you show me how big</p> <p>3 2 millimetres is?</p> <p>4 COMMISSIONER HANSFORD: We can do that here. (Picking up</p> <p>5 a ruler). Here we go. It's just there (indicating).</p> <p>6 CHAIRMAN: Okay.</p> <p>7 COMMISSIONER HANSFORD: That's 2 millimetres.</p> <p>8 CHAIRMAN: 2 millimetres. Wow. Just over a tenth of</p> <p>9 an inch.</p> <p>10 It's just over a tenth of an inch.</p> <p>11 COMMISSIONER HANSFORD: Just under a tenth of an inch.</p> <p>12 CHAIRMAN: The problem I have with this is we're on a work</p> <p>13 site and there's dust and -- I know I keep saying this</p> <p>14 and everybody must be fed up with me, but bear with me</p> <p>15 just a little bit longer -- you're talking about what is</p> <p>16 a very small measurement, and not only that but you're</p> <p>17 talking about a very small measurement against what is</p> <p>18 visually difficult. In other words, what you're seeing</p> <p>19 is threads. You know, that's like trying -- as they do</p> <p>20 if you ever go, which you obviously have been, to</p> <p>21 an opticians and they ask you to pick a number out to</p> <p>22 see if you are colourblind, where you have all the</p> <p>23 little dots and dashes in blue and green behind you, and</p> <p>24 trying to work out 2 millimetres against threads that</p> <p>25 are going diagonally around, which are silver and</p>	<p>1 because when they threaded, it wasn't an exact science.</p> <p>2 In other words, they may on one bar thread one thread</p> <p>3 longer. So obviously I'm wrong there. It is an exact</p> <p>4 science. You put the rebar into the threader and if you</p> <p>5 want 44.5 of a millimetre, you've got it.</p> <p>6 COMMISSIONER HANSFORD: I don't think so.</p> <p>7 CHAIRMAN: Or is it a little less scientific, a little less</p> <p>8 absolute than that? In which case, you are going to</p> <p>9 have to measure every single one.</p> <p>10 COMMISSIONER HANSFORD: That's the point. You will also</p> <p>11 remember, in one of the diagrams you showed us about</p> <p>12 20 minutes ago, it also allowed for minus the tolerance,</p> <p>13 so it could be plus the tolerance or minus the</p> <p>14 tolerance. So it is clearly envisaged that this</p> <p>15 tolerance can go either way.</p> <p>16 CHAIRMAN: In addition to which you have the word</p> <p>17 "tolerance" which itself suggests it's not absolute.</p> <p>18 MR CHOW: What is indicated in that diagram, showing that it</p> <p>19 can be minus -- I can't change if it is what is said in</p> <p>20 the document -- but the other evidence, positive</p> <p>21 evidence from people, first of all from BOSA, repeatedly</p> <p>22 confirmed that the tolerance is always positive, and</p> <p>23 then we have people working on site coming forward,</p> <p>24 testifying to the Commission, saying that what they have</p> <p>25 actually observed on site is 44 and sometimes one more</p>

Page 117	<p>1 thread.</p> <p>2 Now, I appreciate that 2mm is very difficult to</p> <p>3 observe as far as the workers working on site are</p> <p>4 concerned, but I also recall that there is a video</p> <p>5 showing the threading operation. I believe that the</p> <p>6 expert has carried out a visit and that visit was</p> <p>7 videoed, and we received a copy of the video as well.</p> <p>8 After the rebar was threaded and taken out from the</p> <p>9 machine, someone has used a device to screw them in,</p> <p>10 just to ensure the length of the thread. I don't know</p> <p>11 whether, sir, you recall that part of the manufacturing</p> <p>12 process. And with the use of that device --</p> <p>13 CHAIRMAN: I do, yes.</p> <p>14 MR CHOW: With the help of that advice, one would easily</p> <p>15 check generally whether the threaded length is within</p> <p>16 the allowable limits.</p> <p>17 CHAIRMAN: All right. So could I ask this? It's perhaps --</p> <p>18 Prof Hansford is right on top of this, I know that. I'm</p> <p>19 about half a league behind him at the moment, and</p> <p>20 slowing fast.</p> <p>21 Okay. So let me ask this question. If you are</p> <p>22 a worker or if you are an inspector on site and you look</p> <p>23 and you can see two threads; okay? It's been installed;</p> <p>24 you can see two threads. Isn't that sufficient, in</p> <p>25 accordance with the visual inspection page to which you</p>	Page 119	<p>1 2 millimetres or something like that. That's how</p> <p>2 I work. That's what I've been told. Two full threads</p> <p>3 to ensure a proper installation.</p> <p>4 As I've said, I'm a words man more, and those words</p> <p>5 mean to me a very simple thing.</p> <p>6 MR CHOW: Sir, as a layman like me --</p> <p>7 CHAIRMAN: Well, no, you're an engineer. I'm not.</p> <p>8 MR CHOW: -- without personal knowledge of what actually</p> <p>9 happened, if you ask me whether it is sufficient to</p> <p>10 ensure that the coupler connections were properly</p> <p>11 tightened by simply looking at the number of threads</p> <p>12 exposed, my answer is no, it's not sufficient. But we</p> <p>13 are living in the real world. As far as the inspector</p> <p>14 is concerned, unless he himself worked together with the</p> <p>15 workers and he himself felt the screwing process, what</p> <p>16 he can do in the circumstances is just to look at the</p> <p>17 number of threads exposed. If the threaded length is</p> <p>18 less than 44, simply based on the fact that not more</p> <p>19 than two threads exposed, we cannot ensure that the two</p> <p>20 bars were properly tightened, that's correct. But, you</p> <p>21 know, unless there is a better way in terms of project</p> <p>22 management, in terms of site management, this is</p> <p>23 something for Leighton as a main contractor to ensure.</p> <p>24 One of the ways to ensure that is to make sure all</p> <p>25 the workers are properly trained, properly monitored</p>
Page 118	<p>1 have just referred us and according to the tutorials</p> <p>2 that are given on site?</p> <p>3 MR CHOW: Sir, according to the specification of BOSA, the</p> <p>4 figures that we have looked at, if the coupler</p> <p>5 connections were properly tightened, the number of</p> <p>6 threads exposed can vary from zero to two threads,</p> <p>7 depending on the length of the threads. So to answer</p> <p>8 the Chairman's question as to whether it is sufficient</p> <p>9 if one only observes two threads exposed -- well, one</p> <p>10 can only rely on the fact that the workers have properly</p> <p>11 carried out the installation work by properly tightening</p> <p>12 it.</p> <p>13 As to the number of threads exposed, it depends on</p> <p>14 the actual length of the thread, which varies. Now, as</p> <p>15 far as the thread is concerned --</p> <p>16 CHAIRMAN: No, I appreciate all of that, but what I'm doing</p> <p>17 at the moment is I'm trying to put myself in the boots</p> <p>18 of people on site, and the workman and his co-workers</p> <p>19 say, "Two threads showing; isn't that okay?" The</p> <p>20 inspector comes across, he has a look, "Two threads</p> <p>21 showing." Maybe he does this (demonstrating), tests it</p> <p>22 and it's not wobbling around; you know, it appears to be</p> <p>23 fairly tight or it appears to be tight. Isn't that</p> <p>24 sufficient? I don't need to then be worried about</p> <p>25 whether in fact there's an allowance of another</p>	Page 120	<p>1 during their work to ensure they are properly tightened.</p> <p>2 CHAIRMAN: All right. So let's just say here -- and I've</p> <p>3 now got the role of the inspector and I'm there. I'm</p> <p>4 fully and continuously inspecting. And there's one</p> <p>5 coupler where there's some concrete gal, whatever that</p> <p>6 may be, inside. They blow into it but it still remains.</p> <p>7 They screw in and then they see that there is</p> <p>8 an acceptable thread tolerance of two threads. I see</p> <p>9 the same. Surely that's perfectly okay, because that</p> <p>10 direction must take into account the possibility, from</p> <p>11 time to time, there may be some small impediment inside</p> <p>12 the coupler that doesn't enable you to have a full</p> <p>13 butt-to-butt coupling.</p> <p>14 MR CHOW: Yes. It's entirely correct.</p> <p>15 CHAIRMAN: Then that would be okay.</p> <p>16 MR CHOW: Yes. It will pass -- well, I'm not saying it is</p> <p>17 okay as far as BOSA is concerned, but it would pass the</p> <p>18 inspection and it would be accepted.</p> <p>19 CHAIRMAN: Okay, which means it would be okay.</p> <p>20 MR CHOW: Yes.</p> <p>21 CHAIRMAN: Now, let's assume statistically that one in every</p> <p>22 five of these couplers has a little bit of concrete gal</p> <p>23 in it, which means that they are not all butt-to-butt,</p> <p>24 but they all have those two threads showing. On this</p> <p>25 basis, it would nevertheless all fit within the maximum</p>

Page 121	Page 123
<p>1 tolerance.</p> <p>2 MR CHOW: That's correct.</p> <p>3 CHAIRMAN: And therefore, provided everything else was done</p> <p>4 well enough, it would do its job.</p> <p>5 MR CHOW: That's correct.</p> <p>6 CHAIRMAN: Okay. Good.</p> <p>7 MR CHOW: That's correct. So --</p> <p>8 COMMISSIONER HANSFORD: While we are on the subject of</p> <p>9 butt-to-butt, in your subparagraph (8) -- so we are</p> <p>10 still in 49 but we are in (8) -- are you trying to</p> <p>11 redefine "butt-to-butt" there, Mr Chow?</p> <p>12 MR CHOW: No, not at all.</p> <p>13 COMMISSIONER HANSFORD: Because you talk in the last</p> <p>14 sentence about that should be "butt-to-butt" in</p> <p>15 colloquial terms, implying that it's not actually</p> <p>16 butt-to-butt but we'll call it butt-to-butt. Or have</p> <p>17 I read it wrong?</p> <p>18 MR CHOW: No. What the government is trying to say is</p> <p>19 butt-to-butt is not part of the acceptance criteria,</p> <p>20 because we will never know whether it is butt-to-butt.</p> <p>21 But if the workers have followed the installation</p> <p>22 method, then the natural consequence would be</p> <p>23 butt-to-butt inside, but we don't know, I have to accept</p> <p>24 that, because just as what we have demonstrated in the</p> <p>25 table, assuming the situation where the thread length of</p>	<p>1 MR CHOW: This is what his evidence is, but I am making my</p> <p>2 submission on the basis of the other evidence.</p> <p>3 Perhaps --</p> <p>4 CHAIRMAN: Sorry. Okay. So Dr Lau says it has to be</p> <p>5 butt-to-butt.</p> <p>6 COMMISSIONER HANSFORD: Yes.</p> <p>7 CHAIRMAN: Otherwise, essentially --</p> <p>8 COMMISSIONER HANSFORD: It can slip.</p> <p>9 CHAIRMAN: -- it can slip.</p> <p>10 MR CHOW: This is another issue that we have to look at</p> <p>11 later on in my submission. We have a letter from BOSA,</p> <p>12 we will come to that. I take note that before,</p> <p>13 Mr Chairman, you have indicated that that letter is</p> <p>14 somewhat self-serving, but I will come to that.</p> <p>15 I will then move on to explain the acceptance</p> <p>16 criteria adopted in the holistic assessment.</p> <p>17 CHAIRMAN: Just before we do, just to go back on what you</p> <p>18 said was, "No, that's quite correct, quite correct."</p> <p>19 I'm dealing with couplers on one particular part of the</p> <p>20 construction that, shall we say, is only maybe 3 or</p> <p>21 4 feet wide; okay? And the bars are going along there,</p> <p>22 so it's not big, it's not running for 500 metres; okay?</p> <p>23 It's dusty and the workmen do the best they can but</p> <p>24 there's debris inside. Everybody screws it in as tight</p> <p>25 as they can but the debris piles up inside and stops</p>
Page 122	Page 124
<p>1 both rebars was only, say, 45, then if two threads</p> <p>2 exposed on one end, it's simple arithmetic: if we still</p> <p>3 have a gap either side, it won't be butt-to-butt. And</p> <p>4 if we strictly apply the acceptance criteria as set out</p> <p>5 in the visual inspection, it is quite possible that no</p> <p>6 coupler assembly of that kind will have passed the</p> <p>7 inspection and will have been accepted and concrete can</p> <p>8 be poured. This is a fact of life; we need to accept</p> <p>9 that.</p> <p>10 I'm not saying that the guidelines provided or the</p> <p>11 way it is worded is perfect. No, not at all. I'm just</p> <p>12 trying to assist the tribunal as to explain why there is</p> <p>13 such guidelines, because of the variation in thread</p> <p>14 length and that's why the guidelines specify the maximum</p> <p>15 of two threads exposed.</p> <p>16 Actually, Mr Paulino Lim, in his evidence, when he</p> <p>17 described butt-to-butt, he said butt-to-butt is the</p> <p>18 assumed consequence of a proper installation. In other</p> <p>19 words, if someone follows through the installation</p> <p>20 method and if the inspector comes along and observes</p> <p>21 that there is no more than two threads exposed, it is</p> <p>22 assumed to be butt-to-butt, but they can never ensure</p> <p>23 butt-to-butt.</p> <p>24 COMMISSIONER HANSFORD: Yet I thought Dr Lau told us it had</p> <p>25 to be butt-to-butt.</p>	<p>1 actual butt-to-butt, okay, on study later. But</p> <p>2 nevertheless two threads only are shown right the way</p> <p>3 across that section. So that section does not have in</p> <p>4 fact one single butt-to-butt installation; okay? But it</p> <p>5 has no more than two threads showing at all.</p> <p>6 On what you have said earlier, that's a proper</p> <p>7 installation and that will, as a proper installation,</p> <p>8 carry with it the required strength. Yes?</p> <p>9 MR CHOW: I didn't go that far. I said situation like that,</p> <p>10 it would pass the inspection and it would be accepted.</p> <p>11 I would not go so far as to say it's proper and</p> <p>12 therefore it will provide the strength as specified by</p> <p>13 the supplier.</p> <p>14 CHAIRMAN: But if it it's going to pass the inspection and</p> <p>15 be accepted, you can't have "it will pass the inspection</p> <p>16 and be accepted but nevertheless it is not a proper</p> <p>17 inspection and therefore is lacking", can you?</p> <p>18 MR CHOW: Sir, whether it is a proper installation is not</p> <p>19 going to be decided by me. It can only be decided by</p> <p>20 the proprietary product supplier. The product supplier</p> <p>21 tells the government what constitutes a proper</p> <p>22 installation. What the government was told by this</p> <p>23 supplier is they would need about 40mm full-thread</p> <p>24 engagement. This is set out in BOSA's letter dated</p> <p>25 7 January 2019.</p>

Page 125	<p>1 So, as far as the government is concerned, if the</p> <p>2 proprietary product supplier is satisfied with the work</p> <p>3 done, then the government would accept it, because it is</p> <p>4 a proprietary product and the supplier knows their</p> <p>5 product much better than anyone else.</p> <p>6 (Tribunal conferring)</p> <p>7 CHAIRMAN: Maybe I took it one step too far.</p> <p>8 Using my analogy before, everything screwed in, but</p> <p>9 there's debris which you can't quite get out, so right</p> <p>10 the way across the 3 feet of these couplers, they are</p> <p>11 all just showing two threads; okay? And everybody has</p> <p>12 tried to tighten them. Fine. That is a coupling which</p> <p>13 will pass inspection.</p> <p>14 MR CHOW: Yes.</p> <p>15 CHAIRMAN: And whether it's quite what it is, the fact is</p> <p>16 it's acceptable and would be accepted by everybody as</p> <p>17 being a correct and proper installation.</p> <p>18 MR CHOW: And it would be incorporated into the permanent</p> <p>19 work.</p> <p>20 CHAIRMAN: And incorporated into the permanent works. If</p> <p>21 that's going to be the case, it must follow, because you</p> <p>22 won't have that happening unless it has got the</p> <p>23 requisite strength inside it, it must follow it's up to</p> <p>24 muster; it's got the requisite strength?</p> <p>25 MR CHOW: If you look at --</p>	Page 127	<p>1 for me to say. It is for the proprietary product</p> <p>2 supplier to tell us, in those circumstances, whether the</p> <p>3 partially engaged couplers will provide the same</p> <p>4 strength.</p> <p>5 This is really the main issue now because we are</p> <p>6 dealing with a lot of these partially engaged couplers,</p> <p>7 so --</p> <p>8 COMMISSIONER HANSFORD: It sounds rather hazardous to me.</p> <p>9 CHAIRMAN: Yes.</p> <p>10 MR CHOW: Well, on the basis of the documents and the</p> <p>11 acceptance criteria, this would be the position, I'm</p> <p>12 afraid. Now, perhaps it is something to be improved in</p> <p>13 terms of specification, in terms of guidance for</p> <p>14 a visual inspection. There is always room for</p> <p>15 improvement.</p> <p>16 I have to emphasise once again: the government is</p> <p>17 not here to protect BOSA. What we are trying to do is</p> <p>18 to assist the Commission in understanding how to read</p> <p>19 those inspection guidelines. And the example you have</p> <p>20 quoted, Mr Chairman, is a real problem. There can be</p> <p>21 difficulties. In fact in the situation that you have</p> <p>22 given, partially engaged couplers will have passed the</p> <p>23 inspection and been accepted and incorporated into the</p> <p>24 permanent work.</p> <p>25 Now, as to the effect of this on the structure, then</p>
Page 126	<p>1 CHAIRMAN: "Yes" or "no"? It must follow that it's got the</p> <p>2 requisite strength. If it passes muster, if it passes</p> <p>3 the inspection, because there's only two threads showing</p> <p>4 right the way across, and they are not loose, and you</p> <p>5 would say those would pass inspection, it must follow</p> <p>6 that they will have sufficient strength to do their job.</p> <p>7 MR CHOW: What would follow is it will be taken as having</p> <p>8 properly connected, and because of that it infers that</p> <p>9 it has sufficient strength. Whether it has sufficient</p> <p>10 strength is a matter of fact.</p> <p>11 Now, if I can give you an example, in this Inquiry</p> <p>12 there were allegations for cut thread reinforcement. In</p> <p>13 a situation where the thread has been cut, having only</p> <p>14 two threads exposed, in those circumstances, would have</p> <p>15 been accepted as well, but I wouldn't say --</p> <p>16 CHAIRMAN: I appreciate what you are saying. I'm talking</p> <p>17 about in the ordinary course of events, and my</p> <p>18 suggestion was nothing more than some debris inside</p> <p>19 which prevents actual butt-to-butt, but no more than two</p> <p>20 threads showing, everything else is above board, done as</p> <p>21 best as you can do it, it passes muster, a competent</p> <p>22 inspector. That surely now will be acceptable in the</p> <p>23 building of that construction?</p> <p>24 MR CHOW: Yes, but whether such assembly gives the strength</p> <p>25 as specified by the proprietary product supplier is not</p>	Page 128	<p>1 this is the main subject that we have to deal with now.</p> <p>2 CHAIRMAN: Okay. Sorry, I have a problem with that, because</p> <p>3 what you are saying is even if you follow the</p> <p>4 proprietor's instructions, even if the inspection is</p> <p>5 okay, quite rightly, and leaving aside sabotage, leaving</p> <p>6 aside gross negligence, assuming ordinary workmanship</p> <p>7 values, you still can't be sure that this is going to be</p> <p>8 up to standard.</p> <p>9 MR CHOW: If we only relied on the two threads exposed</p> <p>10 acceptance criteria. But don't forget, at the same time</p> <p>11 we have another requirement in relation to the</p> <p>12 installation process. If the foreign materials were</p> <p>13 cleaned, were removed before the installation work, and</p> <p>14 if the steel fixers, after ensuring it is clean inside</p> <p>15 and also clean on the thread, properly screw the</p> <p>16 threaded bar in and then finish it by applying a pipe</p> <p>17 wrench to tighten it, then I would suggest that in such</p> <p>18 circumstances the majority, over 90 per cent, of the</p> <p>19 coupler installation would not be problematic.</p> <p>20 COMMISSIONER HANSFORD: Why only 90 per cent?</p> <p>21 MR CHOW: Just to leave some leeway. I wouldn't say --</p> <p>22 CHAIRMAN: To leave some room for doubt.</p> <p>23 COMMISSIONER HANSFORD: Why would we leave any room for</p> <p>24 doubt?</p> <p>25 MR CHOW: Perhaps there are other problems, perhaps</p>

Page 129	<p>1 a fabrication problem inside the thread, inside the 2 coupler, perhaps it's not perfectly aligned. I don't 3 know. I'm just trying to explain if someone follows the 4 instructions as set out, then normally we would not have 5 a situation where there is concrete gal or foreign 6 material inside the couplers which obstruct the screwing 7 process. 8 So it's not just the inspection requirement. It 9 also has the installation requirement. So I think that 10 also explains why Leighton is supposed to provide 11 full-time and continuous supervision. It's to ensure 12 that the workers carry out the work in accordance with 13 what is required by the material supplier. If there is 14 no full-time and continuous supervision, I agree there 15 is no way to ensure that the couplers are properly 16 installed, because once it is installed, at the time of 17 inspection, no one can make sure they are properly 18 tightened, other than looking at the number of threads 19 exposed. That's why all these requirements are 20 important. We have to ensure they are all complied with 21 to ensure a proper connection. 22 CHAIRMAN: Okay. You are saying inspectors should be there 23 full-time and continuously, right by each thread as it's 24 being put into the coupler, to make sure it has been 25 cleaned, et cetera, et cetera, that it's at the right</p>	Page 131	<p>1 is so spacious, you can see quite clearly. Now, to have 2 one or two supervisors stationed in a work area of about 3 3,000 square feet -- well, if someone wants to cut 4 corners, it is almost impossible. I think this is 5 something that I would like the Commission to 6 appreciate. We are not talking about a very big site, 7 because the slab was done in phases and for each phase 8 the area is limited. 9 So in terms of supervision, it is not as difficult 10 as one may imagine. 11 CHAIRMAN: I suppose it depends the degree to which you have 12 to supervise. If you are having to supervise removal of 13 all small bits of debris within the coupler threading, 14 it may be more difficult to do it. If you are having to 15 supervise people illicitly cutting the ends off 16 continuation bars, then obviously it's not so difficult. 17 COMMISSIONER HANSFORD: Perhaps it depends how much gal 18 there is. 19 MR CHOW: Yes, or what it is. 20 CHAIRMAN: Or what it is. Anyway, sorry, we have kept you 21 a rather long time. It's just that I think for us it's 22 quite important. We can see there are matters of 23 recommendation for how things should be dealt with in 24 the future, and I'm quite sure that the manufacturers of 25 couplers in Hong Kong will be taking into account that</p>
Page 130	<p>1 angle and various things like that? 2 MR CHOW: This goes back to Leighton's point that they are 3 not supposed to be man-marking requirement. 4 CHAIRMAN: I appreciate that. 5 MR CHOW: But Mr Humphrey Ho from the Buildings Department 6 also gave evidence to the Commission in the first round 7 of the Inquiry and he gave his interpretation of the 8 Buildings Department's requirement in relation to 9 full-time and continuous supervision. 10 Now, the gist of his evidence is that you need to 11 put someone there, to ensure that nobody can cut the 12 thread and to ensure that the workers are properly 13 supervised and they are doing the job properly. You are 14 not expected to arrange a man-marking kind of 15 supervision. This is the interpretation of Mr Ho from 16 the Buildings Department. 17 At this point, perhaps if I may make a further 18 point, that if one looks at the amount of concrete 19 pour -- sir, you will recall that the platform slabs 20 were actually cast in phases. If we look at the 21 quantity of the concrete for each phase, and then on the 22 basis of a thickness of 3 metres of the slab, the 23 maximum area that one has to work on is about 24 3,000 square feet. Now, 3,000 square feet is not a very 25 big area when it is in the job site, especially when it</p>	Page 132	<p>1 perhaps there should be more clarity in instructions in 2 future. I don't know. But in addition to that, we're 3 looking at what the individual worker and the individual 4 inspector on site in this construction, what sort of 5 task they were faced with and how best they could deal 6 with it, reckoning that they had a lot of work to do 7 each day and were under pressures of time. 8 MR CHOW: Yes, and the problem can somehow improve by proper 9 and repeated training. Now, a key to it is to ensure 10 that all the workers know what the requirements are, and 11 that perhaps is the best way to ensure proper connection 12 than inspection, if I may submit. 13 CHAIRMAN: Good. 14 MR CHOW: And obviously that is the responsibility of the 15 main contractor. 16 CHAIRMAN: Yes. 17 MR CHOW: If I may just briefly go to the letter. 18 I appreciate that Chairman is not very keen on going to 19 the details of that particular letter, but we have to 20 be -- 21 CHAIRMAN: I'm not keen on the letter at all. I gave my 22 reasons on the letter and I don't think -- 23 Prof Hansford, that letter was written later in the day, 24 when BOSA was, in our view, quite patently in a position 25 to try and protect its own interests and advanced its</p>

Page 133	<p>1 own cause.</p> <p>2 COMMISSIONER HANSFORD: I have used the expression</p> <p>3 "post-event rationalisation" already this afternoon, and</p> <p>4 arguably that falls into this category.</p> <p>5 MR CHOW: Yes. Before I move on, may I just point out one</p> <p>6 factor that is perhaps relevant for the Commission to</p> <p>7 consider the weight of this particular letter? That</p> <p>8 letter didn't come voluntarily from BOSA. That letter</p> <p>9 was a formal response to a specific enquiry made by the</p> <p>10 Buildings Department. This is something that perhaps</p> <p>11 the Commission has to bear in mind.</p> <p>12 CHAIRMAN: Sorry, without going to the letter itself, what</p> <p>13 is the sort of subject area which you wish to raise that</p> <p>14 emanates from that letter?</p> <p>15 MR CHOW: It's that as far as the government is concerned,</p> <p>16 the government cannot ignore what BOSA said. The</p> <p>17 government made specific enquiries as to the property of</p> <p>18 the partially engaged coupler connections. The</p> <p>19 government made a specific request in relation to the</p> <p>20 other properties of, for instance, the permanent</p> <p>21 elongation, the strength of the partially engaged</p> <p>22 couplers, and the government got a letter, the letter</p> <p>23 that we mentioned, from the supplier of this product.</p> <p>24 Although for the purpose of the Inquiry the</p> <p>25 Commission may not give much weight to this letter, but</p>	Page 135	<p>1 MR CHOW: Sir, just now you mentioned about new evidence.</p> <p>2 I'm not sure I quite follow what new evidence you refer</p> <p>3 to.</p> <p>4 CHAIRMAN: Let me put it this way. If it's not new</p> <p>5 evidence, if it's all there already in the documents</p> <p>6 that were available when BOSA gave evidence before the</p> <p>7 Commission, we don't need the letter.</p> <p>8 MR CHOW: Okay.</p> <p>9 Can I just complete it as a matter of record. The</p> <p>10 special request or enquiries made by the Buildings</p> <p>11 Department actually is part of the documents in the</p> <p>12 hearing bundle. Can I just give the bundle reference?</p> <p>13 CHAIRMAN: Yes.</p> <p>14 MR CHOW: It's bundle H26, pages 45479 to 45481. So this is</p> <p>15 an enquiry made by the Buildings Department, and the</p> <p>16 letter from BOSA dated 7 January is in response to the</p> <p>17 specific enquiry, a specific enquiry from the Buildings</p> <p>18 Department.</p> <p>19 CHAIRMAN: 7 January 20 ...?</p> <p>20 MR CHOW: 2019.</p> <p>21 CHAIRMAN: Okay. So that was very close to the end of</p> <p>22 part 1 of --</p> <p>23 MR CHOW: Yes, because the specific enquiry made by the</p> <p>24 government was I think in December, the year before,</p> <p>25 2018, when the discussion about the strength of the</p>
Page 134	<p>1 as far as the government is concerned, if the</p> <p>2 proprietary product supplier tells the government that,</p> <p>3 "My product has to be done in a certain way so that it</p> <p>4 can perform in a way that we specified", then it is</p> <p>5 something that the government cannot ignore.</p> <p>6 CHAIRMAN: I appreciate that. The problem that we face is</p> <p>7 this. Firstly, effectively, you are asking us to</p> <p>8 introduce new evidence, right in the middle of final</p> <p>9 submissions, and you are catching everybody off guard,</p> <p>10 so we are going to have to give extra time. That's</p> <p>11 number one.</p> <p>12 And number two, we've heard from BOSA. They gave</p> <p>13 their position. You yourself have referred to documents</p> <p>14 that BOSA had in circulation when work commenced. The</p> <p>15 fact that later, after this Commission of Inquiry</p> <p>16 commenced, there was correspondence between government</p> <p>17 and BOSA where government said, "Please try and explain</p> <p>18 more to us", in our view -- and this is after BOSA</p> <p>19 itself had given evidence and after there was some</p> <p>20 concern as to its position -- I don't think we are going</p> <p>21 to be assisted.</p> <p>22 By all means you can say the government took</p> <p>23 instructions or investigated and decided to do X, Y and</p> <p>24 Z, but I'm not happy to make this document now part of</p> <p>25 evidence during the course of final submissions.</p>	Page 136	<p>1 partially engaged couplers became the focus of everyone,</p> <p>2 then the government is interested to know what would be</p> <p>3 the strength of the partially engaged couplers, and it</p> <p>4 is pretty obvious from the enquiry itself -- so this is</p> <p>5 how the two letters came into existence.</p> <p>6 If I may then go on to the acceptance criteria.</p> <p>7 Sir, in the holistic proposal, for the purpose of</p> <p>8 stage 2 investigation, MTR proposed to use a phased</p> <p>9 array ultrasonic test, PAUT, to detect the degree of</p> <p>10 thread engagement in the coupler connections. However,</p> <p>11 there is a limitation, as we all know now, in PAUT. Its</p> <p>12 measurement is only accurate to the nearest</p> <p>13 3 millimetres. In other words, for a particular</p> <p>14 measurement by PAUT, the actual engagement inside the</p> <p>15 couplers may be plus or minus 3mm.</p> <p>16 Hence, for a required actual engagement of 40mm, the</p> <p>17 corresponding measurement taken by PAUT may vary from</p> <p>18 37mm to 43mm.</p> <p>19 So adopting an acceptance criteria, MTRC and the</p> <p>20 government had a decision to make: what measurement,</p> <p>21 what minimum measurement, by PAUT, should be used as the</p> <p>22 acceptance criteria? We know that our requirement is</p> <p>23 40mm engagement. Given that the reading may vary from</p> <p>24 37 to 43, if the government and MTR took 43 as the</p> <p>25 acceptance criteria, it will be extremely unfair to</p>

Page 137	Page 139
<p>1 Leighton, and not only that, the result from that 2 investigation would unlikely represent the actual 3 condition of the couplers in the structure. So, at the 4 end, upon further consideration with MTRC, it was 5 decided to give Leighton the benefit of the doubt, so 6 we -- so they accepted the acceptance criteria at 37mm 7 measurement by PAUT. 8 Why 37? It's if the measurement is less than 37, 9 there can be no uncertainty or no argument that the 10 actual engagement length may be still 40mm. Now, on the 11 contrary, if the PAUT result shows an engagement length 12 between 37 and 43, it may still have a chance that the 13 actual engagement is less than 40mm, because of the 14 inaccuracy in the measurement. 15 Now, MTRC and the government were mindful that for 16 a connection giving a PAUT measurement of 37mm, the 17 actual engagement length may well be as low as 34mm. So 18 in order to reduce the number of such extreme cases 19 being accepted unintentionally, they adopt a further 20 acceptance criteria, which is not more than two threads 21 exposed. 22 Now, why? Because according to BOSA's 23 specification, at most the threaded length is only 48mm. 24 Now, if the number of threads exposed is more than two, 25 we are pretty sure that actual engagement would be less</p>	<p>1 that we have estimated today would be 2 an underestimation. But that is just for the sake of 3 argument, if the threaded length was really 44mm but no 4 more. 5 Of course, as we maintain, according to the evidence 6 of BOSA and also the evidence of Neil Ng, what was 7 actually delivered to site were of threaded length 8 ranging from 44 to 48. 9 Sir, if I may then move on to the statistical 10 analysis for estimating the defective rate of coupler 11 connections. The adoption of binomial analysis was 12 proposed by Arup, and at the moment none of the 13 structural engineering experts suggest that it is 14 a wrong method. Dr Glover actually positively confirmed 15 that it is a proper statistical method to be used in the 16 circumstances. The disagreement between the experts is 17 only on what the acceptable engagement length should be 18 under that analysis. 19 Under the statistical analysis, the coupler 20 defective rate at the EWL slab and NSL slab were 21 estimated at 36.6 per cent and 33.2 per cent. As for 22 area A, where the EWL slab connects to the diaphragm 23 wall via a capping beam -- sir, you will recall that for 24 that part of the platform slab, we have a situation 25 where the couplers is both-sided, in the sense that --</p>
Page 138	Page 140
<p>1 than 40, and the adoption of this and other acceptance 2 criterion is just to make sure that not too many of 3 these extreme cases would have been accepted 4 unintentionally, and that explains how the acceptance 5 criteria were arrived at. 6 Now, of course, it is possible that partially 7 engaged couplers will have been accepted under these 8 acceptance criteria, but we are living in the real 9 world. What else can MTRC and the government do in the 10 circumstances? We have to -- as we would understand, 11 one has to move things forward. Technology has some 12 limitation and the best that one can do in the 13 circumstances is to adopt the acceptance criteria that 14 we have been talking so much about. 15 To finish off this topic, can I just follow on from 16 what, Mr Chairman, you have mentioned about what 17 Prof McQuillan observed about the 44mm threaded length? 18 If what happened on site is as what Prof McQuillan said, 19 that is all the threaded bars were only of a threaded 20 length of 44 -- now, if that was the case, by adopting 21 the acceptance criteria, it actually works in favour of 22 Leighton because by accepting two threads exposed, it's 23 almost certain that all the couplers are partially 24 connected, if the threaded length is only 44. If that 25 is the case, the number of partially engaged couplers</p>	<p>1 as compared with the coupler connection with the 2 diaphragm wall, because we proceed on the basis that on 3 the side of the diaphragm wall, the connection was 4 proper, so we never questioned the quality of the 5 couplers on the side of the diaphragm wall. But in the 6 case of the capping beam in area A, the actual 7 opening-up shows that actually the problem, defective 8 screwing-in work occurred on both sides of the couplers. 9 For this reason, a different method has to be 10 adopted to estimate the defective rate. If I may say 11 so, it is a matter of probability, if a coupler assembly 12 is having two weak points, one on each side, and it will 13 fail if either side fail, then the probability of the 14 whole being defective would be higher. 15 Dr Glover, in his rough assessment, he applied 16 a simple probability theory and he made his assessment, 17 but what I'm trying to say is for Dr Glover, he also 18 recognised this fact, that if the couplers are 19 double-sided, then the probability of failure is higher 20 than those we are only concerned with the quality on one 21 side. 22 According to the opening-up result and upon 23 statistical analysis, the combined defective rate for 24 couplers in area A was assessed at 68 per cent. 25 I notice that in other parties' submissions, this</p>

Page 141	<p>1 percentage appears to be high, and the reason being that</p> <p>2 a very limited number of data was used. We have no</p> <p>3 intention to go behind the assessment done by an expert</p> <p>4 in statistics and we can't change the fact of the number</p> <p>5 of samples taken, but the opening-up exercise was agreed</p> <p>6 between the government and MTRCL. We are not in</p> <p>7 a position to go behind what was discussed. According</p> <p>8 to the plan, the opening-up was carried out in</p> <p>9 accordance with the plan, and this is the result</p> <p>10 obtained.</p> <p>11 By adopting this percentage, the designer proceeds</p> <p>12 to carry out the structural assessment under stage 3 of</p> <p>13 the holistic proposal.</p> <p>14 CHAIRMAN: Just so that we have it clear, the figure -- you</p> <p>15 said 68 per cent -- what was the figure?</p> <p>16 MR CHOW: It's the combined defective rate. Actually, to be</p> <p>17 precise, it should be, I think, 68.8.</p> <p>18 CHAIRMAN: All right. So the combined defective rate of</p> <p>19 those couplers and the manner of their coupling is close</p> <p>20 to 69 per cent?</p> <p>21 MR CHOW: Yes.</p> <p>22 CHAIRMAN: All right. And that 69 per cent constitutes what</p> <p>23 sort of a measurement?</p> <p>24 MR CHOW: Of 37 millimetres, 37 millimetres measured by PAUT</p> <p>25 and not more than two threads exposed.</p>	Page 143	<p>1 showing and no more than two threads, that is a proper</p> <p>2 installation. Bear with me. However, when the PAUT</p> <p>3 test comes along, even though there are two threads</p> <p>4 showing, so therefore, on an ordinary person's visual</p> <p>5 inspection, it's a proper installation, because you are</p> <p>6 able to look inside, it's not considered a proper</p> <p>7 installation anymore; okay? And more than that, that</p> <p>8 failure rate is 69 per cent or close to it, and it's</p> <p>9 given no value whatsoever, even though the poor worker</p> <p>10 in his boots and his hat down on the workface, checking</p> <p>11 that it's in tight, as far as he's concerned, and two</p> <p>12 threads are showing, will have had his work given the</p> <p>13 okay by the inspector. Yes?</p> <p>14 MR CHOW: This is the position, yes.</p> <p>15 CHAIRMAN: That's the position?</p> <p>16 MR CHOW: Yes.</p> <p>17 CHAIRMAN: Thank you. Just so that I, in my simple way, can</p> <p>18 understand it. Thank you.</p> <p>19 MR CHOW: Except that perhaps -- I have to point out that we</p> <p>20 are not only -- when we talk about this defective rate,</p> <p>21 we are not only talking about partially connected. We</p> <p>22 have more than 15 per cent of the couplers exposed are</p> <p>23 not connected at all.</p> <p>24 CHAIRMAN: No, no, I appreciate that. There are</p> <p>25 a percentage that were clearly cut, and there are</p>
Page 142	<p>1 CHAIRMAN: All right. So there's not more than two threads</p> <p>2 exposed. All right. So again we come back -- even</p> <p>3 though there's not more than two threads exposed, this</p> <p>4 test shows that 69 per cent of those installations were</p> <p>5 nevertheless defective?</p> <p>6 MR CHOW: Yes.</p> <p>7 CHAIRMAN: Okay.</p> <p>8 MR CHOW: This is the result of the analysis.</p> <p>9 CHAIRMAN: And what strength was given to those defective</p> <p>10 couplers?</p> <p>11 MR CHOW: As I understand it, under stage 3 structural</p> <p>12 assessment, those couplers which are designated as</p> <p>13 defective were ignored, were excluded, and what the</p> <p>14 designers did is with the 68-point-something per cent,</p> <p>15 they worked out equivalent strength reduction factors</p> <p>16 and they applied those factors in their structural</p> <p>17 analysis.</p> <p>18 In other words, as I understand it, those found to</p> <p>19 be defective would be ignored in the structural</p> <p>20 analysis.</p> <p>21 CHAIRMAN: All right. Just so that I understand and no</p> <p>22 doubt the people sitting outside writing for the media</p> <p>23 understand, what we are talking about is there's</p> <p>24 evidence here, and we've agreed it, that provided you</p> <p>25 screw until it's tight and you've got two threads</p>	Page 144	<p>1 a percentage that were not connected at all.</p> <p>2 MR CHOW: That's correct, yes.</p> <p>3 Then about the effect of the partially connected</p> <p>4 couplers. Dr Lau's evidence is that because the</p> <p>5 couplers were not fully engaged, it is only partially</p> <p>6 connected, that is this phenomenon of initial movement</p> <p>7 or bedding-in, the other expert referred to it as the</p> <p>8 bedding-in phenomenon, and because of that these will</p> <p>9 have an effect on the crack width of the structure, and</p> <p>10 if the crack width is excessive -- and by "excessive"</p> <p>11 Dr Lau refers to in excess of 0.3 millimetres as</p> <p>12 specified in the Concrete Code, and Dr Lau is concerned</p> <p>13 with the adverse impact on the long-term durability of</p> <p>14 the structure.</p> <p>15 This is really Dr Lau's concern in relation to the</p> <p>16 partially engaged couplers.</p> <p>17 Sir, if I may --</p> <p>18 CHAIRMAN: Sorry, again, you have to assist me here. As</p> <p>19 I understand it, with the best will in the world and the</p> <p>20 best workers in the world, down there on the building</p> <p>21 site -- and I'm returning to it again without a single</p> <p>22 apology -- they don't have x-ray vision. There's nobody</p> <p>23 from Marvel Comics standing by their side, looking at</p> <p>24 them and saying, "It's not butt-to-butt", so there's</p> <p>25 bound to be a number that are not butt-to-butt. But</p>

Page 145	Page 147
<p>1 you're saying that they had no value at all. What is 2 Dr Lau's evidence in respect of those that are not 3 butt-to-butt? 4 MR CHOW: Dr Lau's evidence is for a proper connection, it 5 has to be butt-to-butt. This is his evidence. 6 CHAIRMAN: Yes. Obviously it does. We accept that. And 7 the result of that is ...? 8 MR CHOW: Well, there is no result that follows from that, 9 because the only result is what the government and MTRC 10 has adopted as the acceptance criteria. 11 As I submitted earlier, adopting such acceptance 12 criteria in fact cannot guarantee butt-to-butt inside, 13 so the requirement of butt-to-butt actually does not 14 produce any result at all. It is the evidence of 15 Dr Lau. It has not affected the assessment. As far as 16 the assessment is concerned, if they satisfy not more 17 than two threads exposed, PAUT measurement in excess of 18 37mm, it will be accepted and it will be taken into 19 consideration in the structural assessment. 20 CHAIRMAN: Yes, but Dr Lau is a highly experienced, 21 impressive witness before this Commission, and we take 22 very seriously what he says, but I need some assistance: 23 when he says that it's not a proper installation unless 24 it is butt-to-butt, he says that that means what? That 25 you give it no value? You give it some value?</p>	<p>1 Answer: But not fit for purpose." 2 So according to this part of his evidence, one can 3 fairly read that basically he does not challenge that 4 partially engaged couplers, based on the test performed, 5 would provide the amount of strength as indicated in the 6 test. 7 However, at the same time, if you look at -- 8 CHAIRMAN: I don't think -- my understanding was that what 9 he was saying is that unless you've got it butt-to-butt, 10 you've got a danger of movement, and the danger of 11 movement can lead to cracking. 12 MR CHOW: Yes, this is his part of the evidence about fit 13 for purpose, because as far as he is concerned the 14 effect of the cracks goes to the question of whether the 15 structure is fit for purpose. 16 CHAIRMAN: Okay. Thank you. 17 MR CHOW: But a further point that is relevant when we talk 18 about strength, at the same time, under paragraph 99 of 19 his first report, he also said: 20 "To allow for the use of partially engaged couplers 21 in structure solely on the basis of the tensile strength 22 obtained from a limited number of tests is not a prudent 23 approach." 24 And in his slide he also mentioned that you need to 25 establish a reliable strength for the partially engaged</p>
Page 146	Page 148
<p>1 MR CHOW: I can't recall Dr Lau having developed further on 2 this point. I am not in a position to speak for Dr Lau 3 on that. 4 CHAIRMAN: We are just going to have a ten-minute break 5 until 4 o'clock; all right? I know, Mr Pennicott, we 6 are running somewhat later, but if we have to sit here 7 a little later, we will have to sit here a little later. 8 MR PENNICOTT: Yes. 9 (3.52 pm) 10 (A short adjournment) 11 (4.08 pm) 12 MR CHOW: Mr Chairman, Prof Hansford, over the break we have 13 taken the opportunity to look at Dr Lau's evidence in 14 relation to the strength of the partially engaged 15 couplers. Now, on 6 January, when he gave evidence, 16 when he was questioned by my learned friend Mr Pennicott 17 about the strength of the partially engaged couplers, 18 and the question put to him is: 19 "You are aware that the other three experts are all 20 agreed that if there's a minimum engagement length of 21 about seven threads or 32 millimetres, the coupler 22 connection should be regarded as having sufficient 23 strength to pass all the necessary strength tests? 24 Answer: Strength tests, yes. 25 Question: Do you agree?</p>	<p>1 couplers, you need to have a full test plan. I think 2 this overall is his evidence in relation to the 3 partially engaged couplers. So his major concern, other 4 than at the moment one should not -- because of the 5 limited number of tests performed on the partially 6 engaged couplers, one should not take it as a definite 7 strength provided by partially engaged couplers. He 8 expects a test plan, in other words a systematic 9 approach on a statistical basis so as to establish 10 a reliable strength for partially engaged couplers. 11 But his major concern is in relation to the effect 12 of elongation, because of the slip, movement or 13 bedding-in, the effect of the crack width on the 14 structure which has an impact on durability, and that is 15 what he refers to as fit for purpose. So this is his 16 position. 17 COMMISSIONER HANSFORD: Am I right, Mr Chow, he then goes on 18 to say that these factors would be remediated by the 19 provision of the suitable measures? 20 MR CHOW: Yes. 21 COMMISSIONER HANSFORD: Okay. Thank you. 22 MR CHOW: Before I move on to the issue about shear links, 23 can I just also point out this. In relation to the 24 residual strength of partially connected couplers, the 25 government has been open to a proposal for justifying</p>

Page 149	Page 151
<p>1 the use of partially engaged couplers in stage 3 2 structural assessment. Now, first of all, just briefly, 3 the first step the government has taken is actually, in 4 relation to the letter in the first Inquiry -- it's the 5 attempt of the government to ascertain from the 6 suppliers the strength of the partially engaged 7 couplers, and then we received that letter from BOSA. 8 But other than that, in February last year, soon 9 after the government received some test reports from 10 GCE, performed on the partially engaged couplers, the 11 government requested MTR to formulate a proposed testing 12 plan so as to establish the characteristic strength 13 properties of the partially engaged couplers, with 14 different degrees of engagement. 15 I would only state for the record the bundle 16 reference. It's bundle OU2/907.64 to 907.65. This is 17 a correspondence from the government raised with the 18 MTRC, requesting for a formal testing plan so as to 19 establish the characteristic strength. 20 However, other than commissioning its own laboratory 21 and GCE to carry out some more tests and after that 22 passing the test results to the government in May, 23 despite there was a special task force and regular 24 meetings were held between government and MTR during 25 that period, there was no attempt by MTRC to engage the</p>	<p>1 having any integrity or value whatsoever in the 2 structural assessment? 3 Answer: In the structural assessment. 4 Chairman: Okay. All right. Now I understand your 5 point -- 6 Answer: [That] is my point." 7 Ignoring everything, as we understood it, if it's 8 not butt-to-butt. 9 Thank you. 10 MR CHANG: Mr Chairman, if I can add on Mr Boulding's point 11 if we can go to the transcript, page 128, the same day, 12 Day 8, on line 1, Mr Chairman asked this: 13 "-- that if it's not butt-to-butt, that thing is 14 useless? It must be; it's the equivalent of not being 15 there. 16 Answer: It should not be used." 17 If we go to line 10: 18 "Chairman: -- or are we saying, 'That's not 19 butt-to-butt, that is as good as worthless. It's no 20 good, you might as well take the whole thing away 21 because it is of no effect?' 22 Answer: For me, it's basically a substandard 23 coupler." 24 Then line 17: 25 "I appreciate that but again we are avoiding each</p>
Page 150	Page 152
<p>1 government in any serious discussion as to what test 2 plan is required to establish the characteristic 3 strength. 4 Upon receipt of the second batch of test reports 5 from MTR in May, the government wrote to the MTR again, 6 and the bundle reference for that correspondence is OW1, 7 pages 285 to 290. But after that, my instruction is 8 that the government received no constructive response 9 from MTR, and that's the reason why so far there has not 10 been any testing scheme so as to establish a reliable 11 value for the strength of partially engaged couplers. 12 CHAIRMAN: This is partially engaged couplers generally? 13 MR CHOW: Generally, yes, that's correct, with different 14 degree of engagement. 15 MR BOULDING: Sir, just before my learned friend goes on to 16 shear links, we were very interested to hear what he 17 said Dr Lau's evidence was, because we've checked the 18 transcript for Day 8, page 122, at lines 7 through to 15 19 and the following exchange took place: 20 "Chairman: No, no. We'll come to that later. I'm 21 just interested in the really dull layman's approach of 22 saying: you are saying that what I have just described, 23 including the coupler, which is a pretty strong piece of 24 iron, all next to each other, running 100 metres along, 25 on top of each other as well, all of that you ignore as</p>	<p>1 other." 2 Then Mr Chairman pointed out at line 24: 3 "But you're not saying that, you're saying that 4 coupler is not butt-to-butt, it's not fully secure, it's 5 therefore -- not just merely in statistical terms but in 6 real, actual scientific, engineering terms -- worthless. 7 It's doing nothing to ensure the integrity of the 8 structure. 9 Answer: That's what I mean, yes. 10 Chairman: Okay." 11 Then to Commissioner Hansford's point, at line 13: 12 "Sorry, I know we keep interrupting you and I do 13 apologise. I don't think you are saying it's prudent to 14 ignore. Aren't you saying it's essential to ignore? 15 Answer: Okay. You can say this." 16 Then finally, page 130, again -- 17 COMMISSIONER HANSFORD: Sorry, but that exchange continued 18 a little bit further. 19 MR CHANG: Yes. 20 COMMISSIONER HANSFORD: "You can say this", and then 21 I asked, "Well, are you?", and he said: 22 "Well, as a prudent engineer, I would ignore it." 23 MR CHANG: Yes. 24 Then at line 22, Commissioner Hansford again asked: 25 "Maybe I haven't quite got the definition of the</p>

Page 153	Page 155
<p>1 word 'prudent'. I thought, from what you just told the 2 chairman, where if it's partially engaged it cannot be 3 considered at all, you are therefore telling us that 4 it's essential to ignore it? 5 Answer: Essential to ignore it, yes." 6 So that's the exchange. 7 COMMISSIONER HANSFORD: Thank you. 8 MR CHOW: Mr Chairman, I don't see any contradiction. The 9 position of Dr Lau is that strength-wise, so far the 10 value used on the basis of a limited number of tests is 11 not reliable, but nevertheless he accepts that what is 12 shown in the test was of certain value, but at the same 13 time don't forget he is concerned with the crack width 14 and he said, for the fitness for purpose, it is 15 a problem. 16 So he does not agree that one should include it in 17 the stage 3 structural assessment, for this reason. 18 I have heard what my learned friend has read out. 19 I myself don't see any contradiction to that. Because 20 of his concern with crack width, he said this should not 21 be included in the structural assessment, and so far 22 that's the reason why our position is that up to now, 23 no one has ever worked out the effect of partially 24 engaged couplers, because of the elongation, on the 25 crack width.</p>	<p>1 I read it as this is the average permanent 2 elongation from the tests on the partially engaged 3 couplers, which Atkins worked out to be 4 0.27 millimetres. 5 "The specification requires less than 0.1 millimetre 6 and the average from the original tests is 7 0.05 millimetre. The difference between the original 8 tests ... and the partially engaged coupler tests is 9 0.22 millimetre over a 200 millimetre gauge. This 10 equates to a stress on 220 Newton per millimetre squared 11 in the correctly installed bars before the partially 12 engaged bars become effective ... 13 To assess this effect on the station the number of 14 effective bars needs to be evaluated. A rigorous 15 approach would be a non-linear assessment to account for 16 the fully engaged bars first up to 0.27 millimetres 17 movement then add the partially engaged bars. 18 Alternatively, and conservatively, the excess initial 19 permanent elongation can be added to the crack width 20 calculated for all bars. 0.1 millimetres is the 21 permitted permanent elongation, so the excess to add to 22 the crack width calculation is 0.27 millimetres ... 23 minus 0.1 millimetres ... equals to 0.17 millimetres. 24 The partially engaged coupler test results show that 25 all the tested bars have similar performance at</p>
Page 154	Page 156
<p>1 At this point, perhaps I should refer to MTR's 2 closing submission, where MTR suggested that Atkins has 3 already looked into the effect of partially engaged 4 couplers on the crack width. But if one reads carefully 5 what is set out by Atkins in the report, Atkins did not 6 look into details, did not work out the effect of 7 partially engaged couplers. 8 If I may quickly take you, sir, to the relevant part 9 of Atkins' report, which actually was cited verbatim in 10 MTR's closing submission. Paragraph 62 of MTR's closing 11 submission for the Original Inquiry. Turn over the 12 page, the following page, in which MTR set out what is 13 set out in Atkins' report. Paragraph 16.8.9: 14 "The small preload induced by the butt-to-butt 15 connection may be sufficient to tighten the coupler 16 against the threads, eliminating the initial slack and 17 reducing the permanent elongation to less than 18 0.1 millimetre over the gauge length. The out working 19 of this is that any coupler which is not tightened 20 'butt-to-butt' will have additional slack and this slack 21 will be mobilised on first loading. This is 22 irrespective of engagement length." 23 Then if we jump to the next paragraph, 16.8.11: 24 "The average permanent elongation from the test 25 results is 0.27 millimetres."</p>	<p>1 serviceability limit state stresses at first yield and 2 they are all still effective to nearly 5 per cent 3 strain. Indeed, the best test results for permanent 4 elongation came from a coupler with 28 millimetres 5 engagement." 6 Then we jump to the following paragraph, 16.8.16: 7 "It would therefore be possible to include the 8 coupled bars with minimum 28 millimetres engagement for 9 the SLS condition, and with minimum 32 millimetres 10 engagement at ULS [that stands for ultimate limit 11 state], in the capacity checks for the structures." 12 The first point to make here is that what Atkins did 13 was to point out the complexity in calculating the 14 effect of the partially connected couplers on crack 15 width. Atkins did not go further to make that 16 assessment. What Atkins should have done is to evaluate 17 the effect and convert it to the crack width, to show 18 that it is less than 0.3 millimetres. 19 Mr Chairman, the 0.3 millimetres is the allowable 20 crack width, and Atkins did not carry out any 21 calculation to show that notwithstanding a certain 22 percentage of partially connected couplers, the ultimate 23 crack width in the structure is still less than 24 0.3 millimetres. 25 So all that Atkins has done here is to point out</p>

Page 157	<p>1 there is complexity in it and this has to be looked at</p> <p>2 in a certain manner, but it did not carry out</p> <p>3 an assessment.</p> <p>4 Sir, the main thrust of Dr Lau's evidence is that</p> <p>5 the crack width is a concern. No one has looked into</p> <p>6 this. If Atkins has done this, as MTR suggested it is</p> <p>7 set out here, one would expect that for such</p> <p>8 an important point, this part of Atkins' report should</p> <p>9 have been put to Dr Lau for his comment.</p> <p>10 Now, it was not done by MTRCL. When</p> <p>11 I cross-examined Dr Glover, I raised a specific question</p> <p>12 and got him to confirm at the moment, up to now, no</p> <p>13 party has looked into the details of the effect of the</p> <p>14 partially engaged couplers on crack width of the</p> <p>15 structure, and Dr Glover agreed with me.</p> <p>16 Now, if it is such an important point for MTR,</p> <p>17 having heard Dr Glover's answer, I would expect that MTR</p> <p>18 would put this document to Dr Glover, for his comment,</p> <p>19 because obviously, according to MTR's today position,</p> <p>20 this very problem has been looked at by Atkins.</p> <p>21 Now, while I am standing here to assist the</p> <p>22 Commission the best I can, I can immediately observe two</p> <p>23 problems with what is set out here. First of all,</p> <p>24 Atkins assumed the 0.27 movement, the average movement</p> <p>25 for the tested coupler assemblies as the same average</p>	Page 159	<p>1 evidence provided to the Commission and has so far, at</p> <p>2 least, been represented by way of a 'watching brief'</p> <p>3 only during the hearing from 2 to 9 January 2020.</p> <p>4 Atkins is not involved in COI 2."</p> <p>5 Then he sets out a number of matters which he thinks</p> <p>6 can be of assistance to the Commission.</p> <p>7 If such an important point relied upon by Dr Lau</p> <p>8 does not stand because Atkins has already looked into</p> <p>9 the problem of crack width, I would expect that Atkins</p> <p>10 would at least mention it in its submission.</p> <p>11 In my respectful submission, the position remains</p> <p>12 that no one has ever looked at the effect of the</p> <p>13 partially engaged couplers on the crack width, and</p> <p>14 Dr Glover agrees that that can be a concern and agrees</p> <p>15 that no one has looked at it. This is the position on</p> <p>16 the basis of the evidence adduced.</p> <p>17 If the Commission thinks it can be better assisted</p> <p>18 by an expert looking at this particular part of Atkins'</p> <p>19 report, we have no objection to that, but it is not</p> <p>20 proper for MTRC, without putting the documents to the</p> <p>21 relevant expert and in its submission to assert that</p> <p>22 this very problem has been looked at by Atkins.</p> <p>23 CHAIRMAN: I suppose it depends how you read what Atkins</p> <p>24 have said.</p> <p>25 MR CHOW: Yes.</p>
Page 158	<p>1 elongation of the couplers in the structure -- first of</p> <p>2 all, there is no basis to make that assumption.</p> <p>3 Secondly, when Atkins tried to calculate the excess --</p> <p>4 talks about the crack width on the basis of</p> <p>5 a calculation of 0.27 millimetres minus</p> <p>6 0.1 millimetres -- the 0.1 millimetres is the limit</p> <p>7 allowed under limit of elongation allowed under the</p> <p>8 code. If one is to assess the crack width, one should</p> <p>9 not deduct the allowable limit. One should have taken</p> <p>10 the whole of 0.27 millimetres as the effect on the</p> <p>11 ultimate crack width.</p> <p>12 Now, unfortunately, this document was not put to any</p> <p>13 of the other experts, and that's why the Commission is</p> <p>14 not able to receive the assistance that it deserves.</p> <p>15 Another telling point is we have received</p> <p>16 a statement from Atkins. If I may quickly refer the</p> <p>17 Commission to that statement, the statement -- or</p> <p>18 submission of Atkins, paragraph 4.</p> <p>19 CHAIRMAN: Yes.</p> <p>20 MR CHOW: From Atkins' submission, the purpose of putting in</p> <p>21 a submission is to assist the Commission, because Atkins</p> <p>22 has followed the structural engineering evidence. In</p> <p>23 paragraph 4 it says:</p> <p>24 "In the light of this direction, Atkins has</p> <p>25 considered the further structural engineering expert</p>	Page 160	<p>1 COMMISSIONER HANSFORD: Just to repeat my previous point,</p> <p>2 Mr Chow, Dr Lau's position is that this problem is</p> <p>3 remediated if the suitable measures are installed; is</p> <p>4 that correct?</p> <p>5 MR CHOW: Yes.</p> <p>6 COMMISSIONER HANSFORD: And indeed the suitable measures are</p> <p>7 being installed.</p> <p>8 MR CHOW: Yes, correct.</p> <p>9 CHAIRMAN: And that applies no matter how conservative</p> <p>10 Dr Lau's views may be considered by some other parties.</p> <p>11 MR CHOW: Yes.</p> <p>12 CHAIRMAN: In other words, the conservative route has been</p> <p>13 taken, in all probability, and all Dr Lau's concerns are</p> <p>14 going to be met by work currently being done.</p> <p>15 MR CHOW: Yes.</p> <p>16 If I may then move on to the issue of shear links.</p> <p>17 Extensive honeycombing occurred at the soffit of the</p> <p>18 EWL slab, and if we can call up a drawing showing how</p> <p>19 extensive it is, at OU5, page 3328.</p> <p>20 COMMISSIONER HANSFORD: Mr Chow, actually, we know about</p> <p>21 this honeycombing, but then in your paragraph 69 you</p> <p>22 say:</p> <p>23 "It is indisputable that concrete with honeycomb</p> <p>24 would not provide the same strength as designed or</p> <p>25 expected", and you quote from a transcript.</p>

Page 161	<p>1 Could we have a look at that?</p> <p>2 MR CHOW: Yes.</p> <p>3 COMMISSIONER HANSFORD: It's the transcript of 8 January,</p> <p>4 page 15, line 17.</p> <p>5 MR CHOW: Yes.</p> <p>6 COMMISSIONER HANSFORD: You refer to lines 17 to 21:</p> <p>7 "Can I take it that if the honeycombing is not</p> <p>8 rectified, it would have a detrimental impact on the</p> <p>9 strength of the concrete?"</p> <p>10 Answer: Yes, but when I say 'yes' to that, it does</p> <p>11 depend on the degree of the honeycombing. If it's</p> <p>12 superficial, the cover, for example -- and I think most</p> <p>13 of this was the cover of the concrete, in other words</p> <p>14 below the lowest bars -- then actually that has no --</p> <p>15 that's cosmetic -- and fire -- but it has no impact on</p> <p>16 the strength."</p> <p>17 Then it goes on, page 19, and you quote lines 18 to</p> <p>18 20, I think:</p> <p>19 "I would like to ask one last question on</p> <p>20 honeycombing, just to make sure that everybody</p> <p>21 understands. Now, you said there is no real linkage</p> <p>22 between honeycombing and the strength of the concrete,</p> <p>23 but as a layperson [and that was you, I think], if we</p> <p>24 see a concrete cube full of honeycombing being tested</p> <p>25 under the same test, I would expect that the strength of</p>	Page 163	<p>1 I'm not suggesting it was deliberately selective, but</p> <p>2 one needs to read the rest to see what Dr Glover was</p> <p>3 really saying, and certainly what I've taken from it is</p> <p>4 honeycombing doesn't affect strength.</p> <p>5 MR CHOW: First of all, I have to make clear that I have no</p> <p>6 intention to mislead the Commission on that.</p> <p>7 COMMISSIONER HANSFORD: No, I understand, but I think the</p> <p>8 reference from the expert is that honeycombing per se</p> <p>9 does not affect strength.</p> <p>10 MR CHOW: Especially when it is rectified. We have no</p> <p>11 dispute with that.</p> <p>12 COMMISSIONER HANSFORD: He is not saying that.</p> <p>13 MR CHOW: Before, he said that --</p> <p>14 COMMISSIONER HANSFORD: Certainly in the bit I just read</p> <p>15 out, he didn't mention rectifying.</p> <p>16 MR CHOW: All right.</p> <p>17 COMMISSIONER HANSFORD: He said honeycombing. He said if it</p> <p>18 was a bunch of stones loosely glued together, then it</p> <p>19 would affect strength, but per se honeycombing does not</p> <p>20 affect strength. That's what I read.</p> <p>21 MR CHOW: Well, that is what he said but --</p> <p>22 COMMISSIONER HANSFORD: Yes.</p> <p>23 MR CHOW: It doesn't matter. My reading perhaps is</p> <p>24 different. In answer to my question --</p> <p>25 COMMISSIONER HANSFORD: How can the reading be different,</p>
Page 162	<p>1 that cube would be much smaller or lower than a concrete</p> <p>2 cube without any honeycombing. Am I wrong?"</p> <p>3 It continues on the next page:</p> <p>4 "Mr Chow, you and I can agree on that, that if you</p> <p>5 test a bunch of stones loosely glued together, it most</p> <p>6 certainly won't pass the test, yes.</p> <p>7 Question: So, in other words, can we infer that if</p> <p>8 there is honeycomb inside the core of the slab, then we</p> <p>9 should expect that the concrete strength at the location</p> <p>10 where there are honeycombs would be lower?"</p> <p>11 Answer: Yes. Well, it's interesting. You and</p> <p>12 I know what causes the honeycombing, and the</p> <p>13 honeycombing is a lack of flowability of the concrete</p> <p>14 which is constrained because the spacing between the</p> <p>15 bars, et cetera, doesn't allow the concrete to flow. In</p> <p>16 the core of this slab, that is not the case, and</p> <p>17 particularly at the top of the slab where we are most</p> <p>18 concerned, it's very visual and very obvious.</p> <p>19 So extrapolating honeycombing at the base of the</p> <p>20 3 metre slab and then saying, 'My goodness me, we've got</p> <p>21 to declare the concrete inadequate in strength', I'm</p> <p>22 sorry, I can't buy into that", said Dr Glover.</p> <p>23 MR CHOW: Yes.</p> <p>24 COMMISSIONER HANSFORD: I just thought your reference to the</p> <p>25 transcript was a little bit partial, slightly selective.</p>	Page 164	<p>1 Mr Chow?</p> <p>2 MR CHOW: The answer given in such circumstances to my</p> <p>3 question, the way I posed the question, I would expect</p> <p>4 that his answer to my question is that it is pretty</p> <p>5 obvious: if the concrete is full of honeycombing, the</p> <p>6 strength would be lower.</p> <p>7 COMMISSIONER HANSFORD: That's not what he said, is it? I'm</p> <p>8 sorry, if that's what he said, please point it out to</p> <p>9 the Commission, because we need to understand this.</p> <p>10 MR CHOW: That is not what he said, but my understanding is</p> <p>11 this is what he meant.</p> <p>12 COMMISSIONER HANSFORD: Ah.</p> <p>13 MR CHOW: But it doesn't matter. It doesn't matter.</p> <p>14 I don't know whether it is really in dispute that</p> <p>15 concrete full of honeycomb is of a lower strength. Is</p> <p>16 it in dispute by anybody?</p> <p>17 COMMISSIONER HANSFORD: Yes, I think it is in dispute.</p> <p>18 MR CHOW: All right, fine. Then --</p> <p>19 COMMISSIONER HANSFORD: Well, that's my reading. The</p> <p>20 experts seem to be telling us that honeycombing does not</p> <p>21 affect strength.</p> <p>22 MR CHOW: Very well. So this is Dr Glover's evidence.</p> <p>23 Then the government's submission is that concrete</p> <p>24 with honeycombing will show a lower strength.</p> <p>25 Sir, if I may --</p>

Page 165	Page 167
<p>1 COMMISSIONER HANSFORD: I'm sorry to labour the point: why 2 is that the government's submission? What's the 3 evidence for that submission? 4 MR CHOW: If this part is not an evidence in support of that 5 submission, then we will review Dr Lau's evidence then. 6 Dr Lau's evidence is that because of the extensive 7 honeycombing, he questioned the quality of the concrete 8 and he said we should not use a higher strength as what 9 the test cube may show. 10 COMMISSIONER HANSFORD: Yes, I think that's right, but 11 I think that was disputed by the other experts. But 12 anyway, I just wanted to make sure I had understood what 13 the evidence in front of us was. 14 MR CHOW: Yes. Sir, if I may continue with ...? 15 CHAIRMAN: Yes, of course. 16 MR CHOW: OU5/3328, please. This is a drawing showing the 17 extent of the honeycomb observed at the soffit of the 18 EWL slab. Because of the honeycombing, MTR observed the 19 condition and arrangement of the shear links in the EWL 20 slab, and it was discovered that the shear links exposed 21 failed to conform to the accepted design. Further 22 opening-up works were therefore carried out at 23 18 further locations of the soffit of the EWL slab for 24 investigation. In total, inspections were carried out 25 at 40 locations which includes the 22 locations of</p>	<p>1 for a large area which measured about 2 metres by 2 2 metres, only one shear link appeared, where according 3 to the accepted design the shear link should have been 4 provided at 300 millimetres spacing. 5 So this is the general picture shown at the soffit 6 of the EWL slab. So in view of the questionable 7 condition of shear links observed at the soffit of the 8 EWL slab, MTR considered that it was appropriate to 9 ignore the contribution of the shear links that may 10 exist in the slab for the purpose of stage 3 structural 11 assessment. In particular, in view of the fact that 12 40 per cent of the locations inspected are found to be 13 without any trace of shear links, Dr Lau is also of the 14 view that ignoring the contribution of any shear link of 15 a somewhat uncertain arrangement in the slab is 16 justified and appropriate in the circumstances. 17 In relation to the other defects, like the 18 insufficient anchorage length or slight variation in 19 spacing, Dr Lau is not particularly concerned and his 20 concern is only with the risk of complete lack of shear 21 links at critical locations. 22 When the shear links that may exist in the slab were 23 ignored, upon stage 3 structural assessment, suitable 24 measures are required at some critical locations, at the 25 NSL slab of the South Approach Tunnel. Therefore, sir,</p>
Page 166	Page 168
<p>1 honeycombing, and the results of the investigation are 2 summarised in appendix B8. If we can go to OU5/3332, 3 please. 4 This is part of the holistic report which summarised 5 the position in relation to the quality of the shear 6 link. Out of a total of 40 locations, if you look at 7 the first row -- or the second row, 16 of the locations 8 show no shear links. 16 out of 40 is almost 9 40 per cent. 40 per cent of the locations show that 10 there exist no shear links. 11 I appreciate that some of the experts suspect or 12 suggest that it doesn't show shear links, perhaps the 13 hook of the shear was attached at an inner layer. 14 During the course of the evidence, I have put to the 15 expert the opening-up method statement. Actually, the 16 method statement suggests that if the removal of the 17 concrete cover shows no shear link, then one should 18 continue to dig further into the inner layer as 19 suggested. 20 It seems that as a matter of fact people did not dig 21 further into the slab, but what is telling is in other 22 locations where there is honeycomb, there was location 23 where the honeycomb actually goes deep into the slab; on 24 occasion it is almost 300 millimetres inside the slab 25 and we still observe no shear link. And in other area,</p>	<p>1 in my respectful submission, the present issues between 2 the experts is not one of engineering issues or 3 technical issues. It's a question of whether, in the 4 light of the extensiveness of non-compliances discovered 5 at the soffit of the EWL slab, whether it is prudent or 6 appropriate, for the purpose of stage 3 structural 7 assessment, to ignore the contribution of shear links 8 that may exist in the slab. 9 So this is not really an engineering problem. 10 COMMISSIONER HANSFORD: But it then becomes an engineering 11 problem, doesn't it, or rather an engineering 12 assessment? 13 MR CHOW: Yes. 14 COMMISSIONER HANSFORD: Because the experts then set out 15 other factors that affect the strength, the shear 16 strength, of the concrete? 17 MR CHOW: Yes, that would be the concrete strength, and 18 also, in the case of the NSL slab, the effect of the 19 partitioning wall between the NSL slab and the mezzanine 20 floor, as well as the underlying earth -- I will come to 21 that, sir. 22 Now, obviously, MTR has no confidence in the quality 23 of the steel fixing work and therefore took the view 24 that it is prudent to ignore the shear links that might 25 exist in the slab, and Dr Lau agrees with it.</p>

Page 169	Page 171
<p>1 In our submission, in view of what one observed at</p> <p>2 the soffit of the EWL slab, which Dr Glover described as</p> <p>3 very unsatisfactory and totally avoidable, there is</p> <p>4 simply no justification or basis at all for MTR to</p> <p>5 proceed as if nothing has happened and assume that the</p> <p>6 shear links at critical locations have been installed by</p> <p>7 Leighton in compliance with the accepted design, and to</p> <p>8 do so, in our respectful submission, would be wholly</p> <p>9 irresponsible on its part, especially when public safety</p> <p>10 is at stake.</p> <p>11 Now, one may suggest, as can be seen from other</p> <p>12 parties' closing submissions, there is no engineering</p> <p>13 basis to assume that there is no shear link, but I would</p> <p>14 say equally there is no basis to assume that the shear</p> <p>15 links at locations we did not see had been properly</p> <p>16 installed.</p> <p>17 So it's a question of -- depending on what position</p> <p>18 you are in, as far as the government and MTRC is</p> <p>19 concerned, which is a public company, when it goes to</p> <p>20 public safety, then are you in a position to take the</p> <p>21 risk, in light of what we have observed in other areas?</p> <p>22 CHAIRMAN: Again, just to put it all into context, remedial</p> <p>23 works are in progress in order to ensure that even if</p> <p>24 there are no shear links, the works will be safe.</p> <p>25 MR CHOW: Yes.</p>	<p>1 page 5, line 3. Sir, Dr Lau said for assessing the</p> <p>2 actual strength of the structure, one has to take or to</p> <p>3 extract concrete cores from the structure.</p> <p>4 If I may now go to paragraph 44 of MTR's closing</p> <p>5 submission. In paragraph 44, MTR refers to a part of</p> <p>6 Atkins' report about the cube strength. Under</p> <p>7 clause 16.6.1, Atkins says:</p> <p>8 "The concrete cubes sampled from the concrete mixer</p> <p>9 trucks during the concreting works and tested for</p> <p>10 strength as part of the quality control and construction</p> <p>11 supervision for diaphragm walls and slabs indicate that</p> <p>12 the actual concrete strengths are typically higher than</p> <p>13 that specified for design. Typical cube strengths of</p> <p>14 above 60 megapascals are common as carried to the</p> <p>15 specified 40 megapascals (slab) and 45 megapascals</p> <p>16 (diaphragm wall) strengths adopted for design. Concrete</p> <p>17 cores taken from the diaphragm walls also provide</p> <p>18 an indication that the in-situ concrete strengths are</p> <p>19 likely exceed that adopted from the original design."</p> <p>20 Pausing here, Atkins referred to the concrete cores</p> <p>21 taken from diaphragm wall. In our respectful</p> <p>22 submission, the concrete used for diaphragm wall is very</p> <p>23 different from the concrete used for the slab. If we</p> <p>24 may go to the method statement of Intrafor, the</p> <p>25 contractor who installed the diaphragm wall, at</p>
Page 170	Page 172
<p>1 CHAIRMAN: And those works -- have they started yet?</p> <p>2 MR CHOW: According to the progress report, I think they</p> <p>3 have started.</p> <p>4 CHAIRMAN: All right.</p> <p>5 MR CHOW: But I'm not 100 per cent -- as to the extent,</p> <p>6 I have no idea.</p> <p>7 COMMISSIONER HANSFORD: But that's the point, isn't it, that</p> <p>8 Dr Lau's position is that this concern that he has will</p> <p>9 be remediated by the provision of the suitable measures,</p> <p>10 and the suitable measures are being installed?</p> <p>11 MR CHOW: Yes. According to the plan, it will be installed,</p> <p>12 and after the remedial actions the problem will not be</p> <p>13 a concern.</p> <p>14 Now, on the question of higher concrete strength,</p> <p>15 other mitigating factors referred to by other experts</p> <p>16 include the possible use of the higher concrete strength</p> <p>17 shown by the cube test in the assessment of the shear</p> <p>18 capacity of the slab.</p> <p>19 Dr Lau's view is that in view of the extent of the</p> <p>20 honeycomb, the quality of the concreting works is in</p> <p>21 doubt, and therefore one cannot make use of the apparent</p> <p>22 higher concrete strength for the purpose of structural</p> <p>23 assessment.</p> <p>24 For the purposes of the record, this is recorded in</p> <p>25 the transcript of 6 January, page 4, from line 3, to</p>	<p>1 bundle H6, pages 1628 and 1629.</p> <p>2 If we can scroll down a little bit -- yes -- here</p> <p>3 Intrafor explains the construction of the diaphragm</p> <p>4 wall, the details:</p> <p>5 "Throughout the construction, the trench is</p> <p>6 maintained full with bentonite mud which supports the</p> <p>7 trench sides against lateral movement. On completion of</p> <p>8 excavation, recycling through desanding equipment cleans</p> <p>9 the bentonite mud, which has become contaminated with</p> <p>10 soil.</p> <p>11 The reinforcement cages are then lowered into the</p> <p>12 bentonite mud filled trench, with each unit spliced to</p> <p>13 the other by mechanical couplers, to form a continuous</p> <p>14 cage to the required depth. Tremie pipes are then</p> <p>15 installed to the base of the panel and concrete is cast</p> <p>16 from the panel toe up to the required cut-off. During</p> <p>17 the casting the displaced bentonite mud is drawn off and</p> <p>18 stored for reuse."</p> <p>19 If we can go to the next page -- in the next page,</p> <p>20 Intrafor provide a diagrammatic explanation of the</p> <p>21 process.</p> <p>22 Just scroll down a little bit. Further down,</p> <p>23 please. Yes.</p> <p>24 Sir, you will see, as described by Intrafor in the</p> <p>25 paragraph that we have just read, for the concreting of</p>

Page 173	Page 175
<p>1 the diaphragm wall, what happened is, first of all, the 2 trench was filled with bentonite mud and the tremie pipe 3 was inserted to the bottom of the diaphragm wall. 4 Concrete was then poured into the tremie pipe. It 5 flowed out from the bottom of the diaphragm wall. 6 Now, to be able to do that, the concrete used has to 7 be very flowable, in other words it flows by itself; we 8 don't need to compact it. And because of that, as more 9 and more concrete is poured, the concrete displaces the 10 bentonite mud, and the concrete level rises up. Now, 11 because this process does not require any compaction, 12 the concrete used would be expected to be very different 13 from the concrete used for the slab. 14 MR BOULDING: Sir, I hesitate to intervene but none of this 15 is in evidence. None of this was put to Dr Glover or 16 indeed any of the experts who supported the use of the 17 concrete cube strengths. My learned friend, as 18 an engineer, is seeking to give evidence from the bar, 19 and it's most objectionable. 20 MR CHOW: Sir, I refer the Commission to a method statement 21 provided by Intrafor. The use of the tremie pipe, the 22 way it was concreted, we can tell from the diagrams that 23 there is no compaction of the concrete involved, unlike 24 the concreting for the slab. 25 You will recall that when I discussed with Dr Glover</p>	<p>1 ascertain the actual strength of the slab, because this 2 is where we need to analyse the shear capacity, one has 3 to take cores, according to Dr Lau, from the slab. 4 To that extent, according to MTR's closing 5 submission, there are only nine cores taken out from the 6 slab. If we may go to ... 7 COMMISSIONER HANSFORD: We do recall that. 8 MR CHOW: Paragraph 99. Altogether there are only nine 9 cores taken out from the EWL slab. I am going to 10 submit, subject to any objection, that nine is grossly 11 insufficient. My reference is if we refer to the number 12 of coupler connections that we need to open up and 13 inspect for the slab, according to the expert in 14 statistics, in order to provide a level of confidence of 15 95 per cent, the minimum number is at least 86 per slab, 16 so 86 for EWL slab and 86 for NSL slab. 17 Now, if one makes reference to these sort of 18 numbers, nine cores obviously is not sufficient. 19 COMMISSIONER HANSFORD: But am I right to say that Dr Lau is 20 not relying on the in-situ strength of the concrete for 21 shear, and for that reason he is advocating the 22 introduction of the suitable measures, and with the 23 suitable measures he will be satisfied on matters of 24 shear, and indeed the suitable measures are being 25 installed?</p>
Page 174	Page 176
<p>1 as to the cause of the honeycomb in the slab, for the 2 concreting of the slab one has to rely on the workers 3 holding a vibrator to ensure that the concrete properly 4 fills all the gaps, in order to avoid honeycombing being 5 formed. 6 Now, the point I'm trying to make here is one should 7 not make use of the core sample taken out from the 8 diaphragm wall because the concrete used for diaphragm 9 wall is very different. The process of concreting is 10 also very different. However, one can make use of the 11 core taken out from the slab. 12 So what I am going to say is that -- 13 CHAIRMAN: Well, can you just not say that? We do remember 14 the evidence about the diaphragm wall. 15 COMMISSIONER HANSFORD: We also know, Mr Chow, that 16 Dr Glover is very familiar with diaphragm walling and 17 tremie pipes. 18 MR CHOW: Yes. 19 COMMISSIONER HANSFORD: So, you know, this is not something 20 he will have missed. 21 MR CHOW: So our submission is that one cannot rely on the 22 core taken out from the diaphragm wall. It was done by 23 a different contractor. It was done under a different 24 concreting process. It was done at a different time. 25 And no compaction was involved. If one wants to</p>	<p>1 MR CHOW: Yes, correct, but about his view on the use of 2 cube strength, in fact his other point -- he said you 3 can't rely on cube strength because for structural 4 analysis you can only use the design strength. 5 COMMISSIONER HANSFORD: Yes. We've heard that. 6 MR CHOW: This is his other point. But the point I make is 7 not the same point as Dr Lau's point. 8 CHAIRMAN: Yes. 9 MR CHOW: Sir, can we make a further observation, on the 10 question of whether it is appropriate to assume the 11 shear reinforcement in NSL slab of SAT, because it is 12 the only area where we need to carry out remedial 13 measures. I observe that actually the same steel fixers 14 doing the EWL slab did the NSL slab of the SAT, so 15 perhaps this is another factor that we have to consider. 16 We are having the same steel fixers under the 17 supervision of the same main contractor who did -- 18 I stand to be corrected. My recollection is Fang Sheung 19 did the South Approach Tunnel whereas Wing & Kwong did 20 the North Approach Tunnel and the HHS. So if that is 21 the case, then the same steel fixers who did the EWL 22 slab and NSL slab of the SAT is the same, and under the 23 same supervision -- under the supervision of the same 24 main contractor. 25 So this is also one factor in considering as to what</p>

Page 177	Page 179
<p>1 position one should take, even if there is no opening-up 2 investigation.</p> <p>3 Sir, if I may move on to the trough wall. Just to 4 speed up my submission, the trough wall here, the issue 5 is without applying the strength reduction factor of 6 35 per cent, the design of the trough wall is 7 sufficient; there's no issue about that. Now, we only 8 have to argue on that because without the opening-up 9 exercise, MTR decided to apply the same load reduction 10 factor for the analysis of the trough wall.</p> <p>11 Again, similar consideration: in light of what we 12 have found in the other part of the structure, whether 13 it is proper or appropriate to assume the quality of the 14 couplers in trough wall is of the same quality -- again, 15 this is not technical. It's not an engineering issue.</p> <p>16 But a similar observation is the couplers in the 17 trough wall, I noted that they were done again by the 18 same steel fixers. This time it's Wing & Kwong who did 19 the original stitch joints, the original shunt neck 20 joint, and the slab and the VRV room. Now, we have 21 looked at the photos showing the defective coupler 22 connection a number of times before. I have no 23 intention to take the Commission to those photos. So 24 this is again a similar observation. We have the same 25 steel fixers who produce the defective couplers in other</p>	<p>1 MR CHOW: Leighton, in its closing submissions, agrees that 2 the purpose of the trough wall is to protect the column. 3 So this is a primary purpose of the column.</p> <p>4 COMMISSIONER HANSFORD: It's containment.</p> <p>5 MR CHOW: Yes, this is the primary purpose. I think it's 6 paragraph 9 -- I'm not 100 per cent sure --</p> <p>7 COMMISSIONER HANSFORD: We know that the trough wall is 8 a containment measure.</p> <p>9 MR CHOW: Yes. So, with the application of the load 10 reduction factors, what Mr Southward tried to justify is 11 by the use of a yield line analysis -- now, what he did 12 with yield line is: let's assume there is a load 13 reduction factor, I ignore all the defective couplers, 14 but what I'm trying to do is by yield line method I can 15 still demonstrate the wall is strong enough to resist 16 a derailed train, an impact from a derailed train.</p> <p>17 However, the problem with his approach is that he 18 has not checked the displacement of the trough wall at 19 the time of failure, because if one makes use of yield 20 line analysis to substantiate the strength, one has to 21 follow it through. Under yield line analysis, if we 22 take a look at figure 8, I believe it's figure 8 of 23 Mr Southward's report, page 13 of Mr Southward's first 24 report. I don't have the bundle number.</p> <p>25 CHAIRMAN: Sorry, Mr Chow, did we explore that earlier? Did</p>
Page 178	Page 180
<p>1 area. Now, for the couplers in the trough wall, we have 2 no -- this is not documented at all. At the beginning, 3 when it was discovered, there is no record as to 4 whereabouts all these additional, undocumented couplers 5 were put in by Leighton. We have no record of any 6 inspection ever carried out by MTR.</p> <p>7 So this is the position. With the lack of all this 8 information, given the same steel fixers who produced 9 defective work elsewhere, is it appropriate for the 10 purpose of stage 3 structural analysis to apply the same 11 load reduction factors? I will say no more than that, 12 other than Dr Lau takes the view that in view of the 13 poor quality of the coupler connections in other areas, 14 it is not unreasonable to adopt the same load reduction 15 factor.</p> <p>16 Now, having applied the load reduction factor, it 17 was found that strength-wise, it is not sufficient to 18 resist the impact load from a derailed train. Then we 19 have an argument on the extent of movement of the trough 20 wall when it is hit by a derailed train, whether it 21 would be of such an extent that it hit the column, the 22 existing column. Sir, you will recall that we have, on 23 a number of locations, existing column which supports 24 the podium above.</p> <p>25 CHAIRMAN: Mmm.</p>	<p>1 the Commission, through yourself and other counsel, 2 explore this issue earlier? I don't mean today, I mean 3 during the Commission.</p> <p>4 MR CHOW: Yes.</p> <p>5 CHAIRMAN: All right.</p> <p>6 COMMISSIONER HANSFORD: Just questioning whether we need to 7 again.</p> <p>8 CHAIRMAN: Yes. Do we need to look at it again, do you 9 think?</p> <p>10 MR CHOW: If the Commission recalls the shape of the yield 11 line, which is a diagonal yield with a triangular piece 12 of wall on top.</p> <p>13 CHAIRMAN: Certainly Prof Hansford does.</p> <p>14 MR CHOW: You will recall that when I discussed this yield 15 line analysis with Dr Glover, by reference to a diagram 16 produced by Mr Southward, which shows a diagonal yield 17 line, and on top of that we have a triangular piece of 18 concrete wall, Dr Glover agreed with me, at failure, 19 under the yield line method, the assumption is that 20 a hinge will be formed along the line and then the piece 21 of wall on top of the hinge will start to sway 22 sideways. The concern with that is when it sways 23 sideways it may hit the column that supports the podium 24 and this is the only concern of Dr Lau.</p> <p>25 Dr Glover, in cross-examination, accepted that it is</p>

Page 181	<p>1 a concern and at the moment it has not been checked.</p> <p>2 MTR in its closing submission criticises or points</p> <p>3 out that notwithstanding Dr Lau's view, he fails to</p> <p>4 carry out any calculation to prove that. What Dr Lau</p> <p>5 says in evidence is he has calculated the angle that the</p> <p>6 wall is allowed to move before it touches the column.</p> <p>7 His figure is 2.7 degrees. Now, we can imagine that</p> <p>8 2.7 degrees is a very small rotation, then it will hit</p> <p>9 the column. In absolute terms, his evidence is that the</p> <p>10 gap between the column and the wall is only 2 inches,</p> <p>11 60 millimetres, slightly more than 2 inches.</p> <p>12 If I may submit that with an arrangement like that,</p> <p>13 one will not need to do any calculation. Imagine</p> <p>14 a train running at 25 kilometres per hour hits onto the</p> <p>15 wall and the wall fails, it behaves like a door leaf and</p> <p>16 a hinge, we don't need someone to do a calculation to</p> <p>17 tell us there is a risk of a piece of concrete wall</p> <p>18 hitting the column.</p> <p>19 So at the moment --</p> <p>20 COMMISSIONER HANSFORD: Sorry, surely we do need</p> <p>21 a calculation to show us that if that happens, will it</p> <p>22 be a problem or won't it be a problem.</p> <p>23 MR CHOW: Yes.</p> <p>24 COMMISSIONER HANSFORD: Yes, we do need that. This is not</p> <p>25 a matter for laypeople.</p>	Page 183	<p>1 integrity of the trough wall; is that correct?</p> <p>2 MR CHOW: Yes.</p> <p>3 CHAIRMAN: And on those assumptions, it is calculated that</p> <p>4 if a trail derails at the right spot, the forces that</p> <p>5 will be displaced by that derailment are such that this</p> <p>6 hinge movement to which you have referred will or may</p> <p>7 operate and may therefore hit the column and cause</p> <p>8 damage to the column, and the column itself has for</p> <p>9 a great many years been holding up a building or is one</p> <p>10 of the structures holding up a building, and you</p> <p>11 obviously don't want that to fall or to be fractured.</p> <p>12 MR CHOW: Yes.</p> <p>13 CHAIRMAN: So what we are looking at here is a protection</p> <p>14 for possible future damage caused by a derailment or</p> <p>15 something similar.</p> <p>16 MR CHOW: Yes, under the suitable measures, as I understand</p> <p>17 it, they are building walls or beams to connect the two</p> <p>18 walls so that when the trough wall is hit, the force can</p> <p>19 be transferred.</p> <p>20 COMMISSIONER HANSFORD: My understanding -- please correct</p> <p>21 me if I've got this wrong -- is that the Commission has</p> <p>22 heard from three experts that the wall will be strong</p> <p>23 enough and this will not hit the column, and the</p> <p>24 Commission has heard from a fourth expert that he</p> <p>25 doesn't agree with that, and therefore suitable measures</p>
Page 182	<p>1 MR CHOW: I agree.</p> <p>2 If we are concerned with causing damage to the</p> <p>3 column, of course we need to also consider the capacity</p> <p>4 of the column, whether under certain impact load it can</p> <p>5 still stand while holding all the weight from the</p> <p>6 podium. Of course, if we want to look into details,</p> <p>7 this is something that one has to calculate. But for</p> <p>8 ensuring that the wall will not hit -- this is our</p> <p>9 primary purpose, to avoid the wall, when it fails, hit</p> <p>10 the column. Then if I may venture to say that we don't</p> <p>11 need a calculation to show -- if Dr Lau agrees with me</p> <p>12 that along the yield line it has become a hinge, we have</p> <p>13 all experience with what is the resistance of a hinge,</p> <p>14 so if we are only concerned with the wall, when it</p> <p>15 fails, hitting the column, if it behaves like a hinge,</p> <p>16 if I may say so, we don't need someone to calculate to</p> <p>17 show that it does not hit the column.</p> <p>18 COMMISSIONER HANSFORD: I think that view is interesting,</p> <p>19 Mr Chow, but in my opinion that's not correct.</p> <p>20 MR CHOW: All right. Thank you. I will move on then.</p> <p>21 So this is really the concern regarding the trough</p> <p>22 wall. So unless --</p> <p>23 CHAIRMAN: So with the trough wall we have a situation where</p> <p>24 because of the steel fixers' less than adequate work</p> <p>25 elsewhere, assumptions are being made about the</p>	Page 184	<p>1 are required to prevent that happening, and indeed my</p> <p>2 understanding is these suitable measures are being</p> <p>3 installed. Is that correct?</p> <p>4 MR CHOW: Sir, it's in line with my recollection, except one</p> <p>5 point. It is not my understanding that the evidence of</p> <p>6 the other experts said the existing walls are strong</p> <p>7 enough and such that when it is hit by a derailed train</p> <p>8 it would not get in touch with the column. The evidence</p> <p>9 of the other experts is that the wall is strong enough</p> <p>10 but they have not checked the displacement. In other</p> <p>11 words, it is strong, but it may have rotated.</p> <p>12 Now, this is -- in a case where we don't have</p> <p>13 an existing column next to it, it is no problem. The</p> <p>14 wall -- under the design philosophy, the wall failed</p> <p>15 because it is ultimate limit state, but what we have</p> <p>16 here is because we have an existing column so close to</p> <p>17 the wall, we cannot allow the wall, when it fails, to</p> <p>18 hit on the column. So in this particular case one has</p> <p>19 to check the displacement of the wall when it fails.</p> <p>20 COMMISSIONER HANSFORD: Okay.</p> <p>21 MR CHOW: And my -- sorry.</p> <p>22 COMMISSIONER HANSFORD: No, I understand your point. My</p> <p>23 recollection of the evidence of the structural experts</p> <p>24 is slightly different, but we can check it and indeed</p> <p>25 I'm sure we will be assisted by counsel for the other</p>

Page 185	<p>1 parties in their closing submissions, but the key point</p> <p>2 is that suitable measures are being installed that would</p> <p>3 prevent this happening in any event.</p> <p>4 MR CHOW: Yes.</p> <p>5 COMMISSIONER HANSFORD: Thank you.</p> <p>6 CHAIRMAN: So this is to shore up and ensure the integrity</p> <p>7 of structures in that area, in the event, at any time</p> <p>8 during the lifetime of the station, there should be</p> <p>9 a derailment of sufficient strength?</p> <p>10 MR CHOW: Yes, that's the idea.</p> <p>11 CHAIRMAN: All right. Thank you very much.</p> <p>12 MR CHOW: Sir, I see it is 5.15. I wonder whether the</p> <p>13 Commission is willing --</p> <p>14 CHAIRMAN: I'm happy for you to continue. I think it's</p> <p>15 important. Yes. And sorry, this is not a criticism,</p> <p>16 but this is based on some concerns, not fully</p> <p>17 investigated, that the trough wall may not have been</p> <p>18 built as it should have been.</p> <p>19 MR CHOW: Yes.</p> <p>20 COMMISSIONER HANSFORD: Can I ask how long we can anticipate</p> <p>21 this going on?</p> <p>22 MR CHOW: I only have one more topic, on construction joint.</p> <p>23 COMMISSIONER HANSFORD: Can we have a brief break?</p> <p>24 CHAIRMAN: Yes. Stretch your legs. Five minutes. Thank</p> <p>25 you.</p>	Page 187	<p>1 and also because of the internal condition of the</p> <p>2 station which is dry, one should not be concerned with</p> <p>3 the cracks.</p> <p>4 In respect of this, may I just point out that in</p> <p>5 reality we don't have a dry situation inside the station</p> <p>6 box structure. It has now been established that the top</p> <p>7 of the EWL slab is at the level of plus 2.85 metres</p> <p>8 above the principal datum, whilst the groundwater</p> <p>9 variation as set out in Atkins' report -- for the</p> <p>10 purpose of the record, it's in bundle AA2, page 527; we</p> <p>11 don't need to go to that -- the variation of the</p> <p>12 groundwater level is from minus 0.2 metres above</p> <p>13 principal datum to plus 2.8.</p> <p>14 In other words, if the record set out in Atkins'</p> <p>15 report is correct as to the variation of groundwater</p> <p>16 level, the most part of the EWL slab in fact is within</p> <p>17 the variation of the groundwater table. So, in other</p> <p>18 words, at the external side of it, it will be subject to</p> <p>19 dry and wet condition.</p> <p>20 Now, I don't think there is any dispute on that.</p> <p>21 COMMISSIONER HANSFORD: I think there is. I think there's</p> <p>22 massive dispute.</p> <p>23 MR CHOW: Then I withdraw --</p> <p>24 COMMISSIONER HANSFORD: I think there's massive dispute</p> <p>25 because the issue was that it doesn't have cycles of</p>
Page 186	<p>1 (5.15 pm)</p> <p>2 (A short adjournment)</p> <p>3 (5.24 pm)</p> <p>4 CHAIRMAN: Yes, Mr Chow.</p> <p>5 MR CHOW: Mr Chairman and Prof Hansford, the last issue is</p> <p>6 the construction joint in areas B and C. All experts</p> <p>7 agree it is only a workmanship issue. The only</p> <p>8 difference between Dr Lau and Prof McQuillan is whether</p> <p>9 the dowel bars proposed by MTR and its design consultant</p> <p>10 are necessary from a structural point of view and</p> <p>11 whether the installation of the dowel bars which involve</p> <p>12 coring a vertical hole of 32 millimetre diameter into</p> <p>13 the diaphragm wall would accidentally cut any shear</p> <p>14 reinforcement in the diaphragm wall and therefore cause</p> <p>15 structural damage to the as-built station structure.</p> <p>16 Dr Lau is of the opinion that the dowel bars being</p> <p>17 installed pursuant to the accepted suitable measures</p> <p>18 will reduce the internal stress in the connection to</p> <p>19 reinstate the intactness of the joint and help to reduce</p> <p>20 cracking. Obviously the said dowel bars anchors to the</p> <p>21 new reinforced concrete slab on top of the reinforced</p> <p>22 EWL slab have been considered necessary by MTRC's</p> <p>23 consultant.</p> <p>24 Sir, at the moment the other experts and the other</p> <p>25 parties suggest that the issue of cracks is not real,</p>	Page 188	<p>1 wetting and drying.</p> <p>2 MR BOULDING: Yes, sir. That's it exactly.</p> <p>3 MR CHOW: Okay.</p> <p>4 COMMISSIONER HANSFORD: And we've heard from the other</p> <p>5 experts on that, so the Commission is well aware of the</p> <p>6 positions of the different parties on that point.</p> <p>7 MR CHOW: Sorry. Then I withdraw my statement then.</p> <p>8 The record set out in Atkins' report is -- we know</p> <p>9 there is a variation of groundwater level. We know that</p> <p>10 the diaphragm wall, at least the outside, is in contact</p> <p>11 with soil, and also we now know that the top of the EWL</p> <p>12 slab is at plus 2.85. So this is the overall</p> <p>13 configuration of -- if one takes a cross-section of the</p> <p>14 structure.</p> <p>15 The other issue is what is the condition inside the</p> <p>16 station box structure. The other experts said it is dry</p> <p>17 so it should not be a concern, and because it is dry the</p> <p>18 exposure condition should be considered as --</p> <p>19 CHAIRMAN: Mild.</p> <p>20 MR CHOW: -- mild or exposure condition 1, instead of</p> <p>21 between 2 to 3. Dr Lau's view is that the exposure</p> <p>22 condition is actually between mild and severe, which</p> <p>23 corresponds to between exposure conditions 2 and 3.</p> <p>24 On the question of whether it is really dry inside</p> <p>25 the station box structure, perhaps it is of relevance to</p>

Page 189	<p>1 look at what MTR states in its opening submission for</p> <p>2 the first part of the Inquiry. Paragraphs 115 and 116,</p> <p>3 MTR's opening submission for the first part of the</p> <p>4 Inquiry. Paragraph 115. There we go.</p> <p>5 This is MTR's submission back on the first day of</p> <p>6 the first round of the hearing. It said:</p> <p>7 "The press and media have also reported on the</p> <p>8 existence of cracks and water leakage on the diaphragm</p> <p>9 walls, even though the diaphragm walls have been built</p> <p>10 in full compliance with the stringent requirements under</p> <p>11 contract 1112.</p> <p>12 Underground water in the soil and rock strata</p> <p>13 commonly exits through the joints of the diaphragm wall</p> <p>14 panels, causing damp patches to form on the concrete</p> <p>15 faces, which is perfectly acceptable provided the</p> <p>16 tolerance level specified in the M&W specification is</p> <p>17 not exceeded."</p> <p>18 Then if we can quickly go to what Mr Boulding said</p> <p>19 in opening, the transcript of 23 October 2018, page 22,</p> <p>20 line 20, where Mr Boulding said, at the end of the line:</p> <p>21 "And the reality of the situation, we would</p> <p>22 emphasise, is that a diaphragm wall is an underground</p> <p>23 structure so it's technically difficult to achieve full</p> <p>24 watertightness. Indeed, this fact is recognised by</p> <p>25 MTR's Materials and Workmanship Specification for Civil</p>	Page 191	<p>1 COMMISSIONER HANSFORD: Sorry, just on this point, though,</p> <p>2 my understanding is -- correct me if I am wrong -- that</p> <p>3 Dr Lau's evidence was that there was a risk of cracks</p> <p>4 forming on the outside of the wall and that therefore,</p> <p>5 in his view, the suitable measures were needed to</p> <p>6 prevent those cracks from occurring --</p> <p>7 MR CHOW: Yes.</p> <p>8 COMMISSIONER HANSFORD: -- and indeed those suitable</p> <p>9 measures have been installed or are being installed.</p> <p>10 MR CHOW: Yes.</p> <p>11 COMMISSIONER HANSFORD: So therefore those cracks that he</p> <p>12 opines might occur would not occur. So irrespective of</p> <p>13 the environmental conditions with the remedial works</p> <p>14 being carried out -- sorry, I should call them the</p> <p>15 suitable measures being carried out, which are indeed</p> <p>16 being carried out -- this would not be an issue.</p> <p>17 MR CHOW: Yes, except that he didn't go so far as to suggest</p> <p>18 that with the remedial measures cracks would not be</p> <p>19 formed. He said that with the installation of dowel</p> <p>20 bars, the cracks would be in control, reduce the stress</p> <p>21 and then improve the cracking situation. I think this</p> <p>22 is --</p> <p>23 COMMISSIONER HANSFORD: So is he still saying it would be</p> <p>24 a problem after the suitable measures are installed?</p> <p>25 MR CHOW: No.</p>
Page 190	<p>1 Engineering Works ..."</p> <p>2 So from what MTR said, one cannot expect a dry</p> <p>3 condition at the inside or the interior of the station</p> <p>4 box structure.</p> <p>5 Let's look at what Dr Lau said, the transcript of</p> <p>6 6 January, page 28, line 5 to line 18, where Mr Khaw</p> <p>7 asked:</p> <p>8 "You recall that when you were discussing this point</p> <p>9 you told Mr Chairman and also Prof Hansford that you</p> <p>10 might come back to this point. Would you like to have</p> <p>11 anything to say on this point?"</p> <p>12 Answer: Okay. First of all, I hope that the</p> <p>13 Commission understand that diaphragm walls are discrete</p> <p>14 panels. They are not watertight diaphragm walls. So,</p> <p>15 actually, even though there is no seepage through the</p> <p>16 diaphragm wall joint, it is still moist. Still moist.</p> <p>17 First of all, so I don't think it is 'mild' in that</p> <p>18 sense. That means inside the diaphragm wall enclosure,</p> <p>19 it is quite moist, because of -- sometimes you will have</p> <p>20 seepage. Even though there's no seepage, it is still</p> <p>21 moist, so it is not 'mild' in this sense."</p> <p>22 So this is what we gather from the evidence, it's</p> <p>23 not entirely dry, as one would suggest.</p> <p>24 Then regarding the risk of damaging shear links</p> <p>25 during coring operation --</p>	Page 192	<p>1 COMMISSIONER HANSFORD: He is not. So my point is right,</p> <p>2 he's saying the suitable measures will remediate that</p> <p>3 problem?</p> <p>4 MR CHOW: That's correct.</p> <p>5 COMMISSIONER HANSFORD: Okay. That's what I understood.</p> <p>6 CHAIRMAN: And this is a workmanship issue, not a safety</p> <p>7 issue?</p> <p>8 MR CHOW: Yes. No. Not a safety issue, a workmanship</p> <p>9 issue.</p> <p>10 But of course if it is not addressed then if there</p> <p>11 is a problem with cracking, then with time it may have</p> <p>12 an impact on --</p> <p>13 COMMISSIONER HANSFORD: I understand, but it is being</p> <p>14 addressed.</p> <p>15 MR CHOW: Right, yes.</p> <p>16 Now, regarding the risk of damaging the shear links</p> <p>17 during the coring operation, Dr Lau told the Commission</p> <p>18 that the operator would know from the noise generated</p> <p>19 when the reinforcement is encountered, he would then</p> <p>20 stop the operation, and in our respectful submission</p> <p>21 what he actually said is in line with the method</p> <p>22 statement proposed by Leighton. Actually Leighton</p> <p>23 proposed that when the reinforcement is crashed, then</p> <p>24 the operation will stop and they will seek further</p> <p>25 instruction from MTR.</p>

Page 193	Page 195
<p>1 Up to 16 January, there are altogether 29 core holes 2 done out of a total of 47 core holes, and my instruction 3 is that during the previous coring operation, on 4 a number of occasions, the operator did encounter shear 5 reinforcement and on each and every occasion they 6 managed to notice it and they stopped the operation, and 7 up to now, from the inspection of the core taken out 8 from the structure, no reinforcement has been cut so 9 far. 10 CHAIRMAN: All right. Good. So what you've got is 11 a concern raised by one of the experts, the Commission's 12 expert, perhaps two, that there is the danger of cutting 13 into the metal inside the structures. This has been 14 taken on board by the people doing the works, the 15 suitable measures, and they have so far managed to avoid 16 cutting any of the rebars or steel structure inside, and 17 so that risk has been fully taken into account. 18 MR CHOW: Yes. That's correct, sir. 19 However, Prof McQuillan's concern is duly taken care 20 by the government. As we have explained in our written 21 closing submissions there are a number of factors that 22 the government consider. I think the overriding 23 consideration is if we take any action or suspend the 24 work, then there would be implication on the programme, 25 on the completion date and the commissioning of the</p>	<p>1 main concern, if I may quickly summarise, is first of 2 all it is not proper to take the result of the very 3 limited number of tests on partially engaged couplers as 4 reliable indication of the strength of those couplers 5 for the purpose of structural analysis. And in any 6 event, one should not only look at the strength; the 7 effect of those partially engaged couplers on crack 8 width would be a concern, and at the moment no party has 9 looked at it in detail to ensure that the crack width 10 will not exceed 0.3 millimetres. 11 Thirdly, in respect of the trough wall, the purpose 12 is to protect the column which supports the podium above 13 and at the moment, again, someone has to look at the 14 lateral displacement of the trough wall under impact 15 load. So far, it has not been done. 16 As to the shear strength of the slab, he was only 17 concerned with the risk of complete absence of shear 18 link at critical location, and bearing in mind that 19 40 per cent of the area in EWL slab inspected showed no 20 shear link, and the NSL slab in SAT was done by the same 21 steel fixers, he himself cannot rule out the possibility 22 that in view of the condition of the shear link observed 23 at the soffit of the EWL slab, that perhaps at critical 24 locations we have a problem with the shear link. That 25 is really his position.</p>
Page 194	Page 196
<p>1 whole project. 2 Given the position today, no shear link has been 3 damaged, and also, more importantly is that 4 Prof McQuillan confirmed that even if a shear link is 5 damaged accidentally, it would not cause real structural 6 concern. So for this reason the government did not 7 intervene so far, but however the government keep 8 monitoring the coring process to make sure that the 9 method statement are fully complied with. 10 COMMISSIONER HANSFORD: Good. I think the Commission notes 11 the action that you have taken and the reasons that you 12 have taken it. My personal view would be they might be 13 the wrong reasons. You know, if there really was 14 a serious safety issue, it would be irresponsible to 15 proceed just because programme and cost dictate that you 16 should. 17 MR CHOW: Of course. I fully agree with that. 18 COMMISSIONER HANSFORD: But the Commission has been 19 satisfied, I think, that this safety risk has been 20 mitigated. 21 MR CHOW: Yes. Of course. 22 Sir, as a concluding remark, we would like to say 23 that Dr Lau was only trying to assist the Commission by 24 pointing out some of the problems that he observed in 25 the approach and the analysis of the other expert. His</p>	<p>1 Sir, if at the end of the day the Commission is 2 going to conclude that the as-built structures are safe 3 and fit for purpose on a number of assumptions, for 4 example the shear links have been provided at critical 5 locations of the slab, and the coupler connections in 6 the trough walls are all properly done, and the 7 partially engaged couplers in the structure are of 8 a strength as shown in those tests performed, we would 9 invite the Commission in its final report to state this 10 assumption so that the public can be informed of the 11 true position. I hope that the Commission will consider 12 that. 13 The way -- on the basis of what we have so far, if 14 the Commission is going to find that the structure is 15 safe and fit for purpose, that must be on the assumption 16 that the problem, the uncertainty that we are facing 17 now, is not real. For example, there are shear links in 18 the slab. So this must be one of the assumptions and we 19 would invite the Commission to accept these basic 20 assumptions. 21 CHAIRMAN: With respect, I think that's overly simplistic. 22 I think the view that myself and Prof Hansford are going 23 to take, probably, after we have been able to consider 24 all of the matters put before us, is that we found all 25 the experts that appeared before us to be of great</p>

Page 197	<p>1 credit, highly professional. That includes Dr Lau. He 2 had a different approach, and we do not in any way wish 3 to undermine that approach. What we end up with is 4 a situation where, on Dr Lau's basis, and in recognition 5 of his expertise, government is taking certain measures 6 which will, in the view of the government, ensure safety 7 and fit for purpose. That, I would imagine, we may well 8 say, would be of solace to the public.</p> <p>9 COMMISSIONER HANSFORD: Yes. On one view, some of those 10 measures may be considered to be conservative, but 11 irrespective of that, they are being installed.</p> <p>12 CHAIRMAN: And on other views they may even be considered to 13 be unnecessary, but out of an abundance of caution, in 14 the light of all the "politics" that has thundered 15 around this matter -- not so much now; there have been 16 other things to take up the public interest -- but 17 certainly in the early days, measures like this, even if 18 they are there simply to assuage public concerns, you 19 know, that itself clearly, in a Commission of Inquiry as 20 opposed to a court of the classic kind, is a forward 21 matter.</p> <p>22 So we are aware, in our role as Commissioners, that 23 we have to look at matters in a broader aspect, and 24 I have emphasised before and Prof Hansford has: we are 25 not here to determine issues of contractual liability.</p>	Page 199	<p>1 mistaken, subparagraph (11) introduces a new definition 2 of "fitness for purpose" that wasn't introduced by the 3 experts, and that being, if I may paraphrase -- and tell 4 me if I've got it wrong -- that the government does not 5 consider it fit for purpose unless it can be approved 6 for opening by the authorities that accept the 7 structure. I think that's what paragraph (11) is 8 effectively saying.</p> <p>9 I just want to check that that's my understanding, 10 because that is different to the definition of fitness 11 for purpose that I think the experts gave us and indeed 12 Dr Lau gave us. Am I correct?</p> <p>13 MR KHAW: Perhaps if I could assist. When we were dealing 14 with this particular point in paragraph 32, we were 15 trying to recite part of our submissions given on 16 10 October when the Commissioner was considering the 17 directions for structural engineering evidence.</p> <p>18 COMMISSIONER HANSFORD: Yes.</p> <p>19 MR KHAW: So at that time the point that we put forward was 20 probably, if we look at it now, broader than the scope 21 of evidence put forward by the experts --</p> <p>22 COMMISSIONER HANSFORD: Indeed.</p> <p>23 MR KHAW: -- in compliance with the directions given by the 24 Commissioner. So there is an evolution of this concept 25 of fitness for purpose after we have heard evidence from</p>
Page 198	<p>1 I mean, we may even turn around and say that 2 a particular measure, in our view, is entirely 3 unnecessary, but then say: however, concerns have been 4 raised about it and they have been raised by eminent 5 experts, and in addition to which one has to look at 6 different approaches to issues of what is fit for 7 purpose and what is safe and what is or may be required 8 by the Buildings Department and the various statutes in 9 order to allow the commissioning, and those things can 10 often melt into each other.</p> <p>11 So our approach -- well, it wasn't a criticism of 12 you, Mr Chow, it was just to say we are looking at 13 matters provisionally, subject to all the things that 14 were going to be said to us, on a reasonably broad 15 basis, looking to the public interest.</p> <p>16 MR CHOW: I'm grateful.</p> <p>17 COMMISSIONER HANSFORD: Can I just raise one further point, 18 Mr Chow, while you are on your feet.</p> <p>19 MR CHOW: Certainly.</p> <p>20 COMMISSIONER HANSFORD: It relates to your closing 21 submission on expert evidence for COI 1, and it's in 22 paragraph 32 and it's in subparagraph (11).</p> <p>23 It seems to me that the Commission has received from 24 experts their definitions of safety, on the one hand, 25 and fitness for purpose, on the other hand. If I'm not</p>	Page 200	<p>1 the experts. I have to agree that the experts actually 2 did not deal with that particular question in that way 3 and we just have to be bound by what we have heard from 4 the experts on this concept of fitness for purpose, and 5 we are not trying to actually enlarge the scope of 6 fitness for purpose by going back to our earlier 7 submissions made on 10 October.</p> <p>8 COMMISSIONER HANSFORD: So, just so that I'm clear, Mr Khaw, 9 does that mean you are withdrawing subparagraph (11)? 10 Is that now superseded by what we have been told in 11 expert evidence?</p> <p>12 MR KHAW: If we look at the expert evidence which is given 13 from a structural engineering point of view, if we 14 confine the evidence to that particular area, I would 15 have to say that this particular paragraph does not sit 16 comfortably with the evidence that we have heard, and in 17 that case it does not form part of the considerations 18 when one takes into account the structural engineering 19 experts' evidence.</p> <p>20 But when it comes to the other structural 21 assessments, for example, the HP and VP, whether this is 22 part of the policy consideration, I really can't detach 23 this particular factor from those structural 24 assessments, even though that does not constitute part 25 of the structural engineers' evidence that we have</p>

Page 201	Page 203
1 received.	1
2 COMMISSIONER HANSFORD: So am I right in saying -- and this	2
3 is no criticism -- that government's case is that it	3
4 needs to be safe, it needs to be fit for purpose, as	4
5 defined by the structural experts, and it needs to be	5
6 acceptable to the authorities to open? Three criteria.	6
7 MR KHAW: Yes, if we are not confining ourselves only to the	7
8 evidence which has been received in accordance with the	8
9 directions on structural engineering perspective.	9
10 COMMISSIONER HANSFORD: Yes. Thank you. That's helpful.	10
11 CHAIRMAN: Good. Thank you, Mr Chow. Sorry, we have given	11
12 you a little bit of a rough ride. Sorry. But you have	12
13 had the good fortune or ill fortune to fall to speak	13
14 concerning a matter of concern to us, obviously of real	14
15 concern to us, and that's why we felt it necessary to	15
16 test that evidence, and to test your submissions. Thank	16
17 you very much, Mr Chow.	17
18 MR PENNICOTT: I blame Mr Khaw!	18
19 Sir --	19
20 CHAIRMAN: Yes, Mr Pennicott.	20
21 MR PENNICOTT: -- tomorrow, timing. I think, out of	21
22 an abundance of caution, unless there are going to be	22
23 howls of protest from behind me, that we perhaps ought	23
24 to start a bit earlier, perhaps 9.30.	24
25 CHAIRMAN: I have already given a little tick to a request	25
Page 202	
1 in writing that we start at 9.30. Let me just check	
2 with other counsel because I don't want to ride	
3 rough-shod over their wishes.	
4 MR CLAYTON: I'm entirely comfortable with that.	
5 CHAIRMAN: Good.	
6 MR BOULDING: Sir, we can accommodate that as well, sir.	
7 Thank you.	
8 MR CHANG: We too.	
9 CHAIRMAN: Excellent. Thank you all very much.	
10 Mr Tsoi?	
11 MR TSOI: Yes, of course.	
12 CHAIRMAN: Excellent. So we will start tomorrow morning at	
13 9.30 and apologies for keeping you until nearly 6.00	
14 this evening. Thank you.	
15 (5.52 pm)	
16 (The hearing adjourned until 9.30 am the following day)	
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21	
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23	
24	
25	

INDEX	
	PAGE
Closing statement by MR TSOI	2
Closing statement by MR KHAW	50
Closing statement by MR CHOW	93