Tuesday, 28 May 2019

(10.03 am)

Opening submissions by MR CHOW

CHAIRMAN: Yes.

MR CHOW: Good morning, Chairman. Good morning, Prof Hansford.

Before I proceed to provide an update on the progress of the work under the holistic assessment, I would like to pick up on a point made by my learned senior, Mr Khaw, yesterday, about the type of couplers approved to be used at the interface, which appears to Prof Hansford to be in contradiction with what is recorded in the meeting minutes of the interface meeting.

I hope I am able to clear up some of the confusion. Yesterday, Mr Khaw said:

"Insofar as contract 1111 is concerned only one type of coupler has been accepted by BO team for the rebar connections at the interface."

This statement is correct insofar as joint 1 and joint 3 of the NSL Tunnel are concerned. What is recorded in the meeting minutes, saying that approved mechanical splicing system of rebar, T40 couplers is BOSA, others are Lenton, is also correct. But there is really no contradiction between the two.

If I may further explain by taking the Commission to

a few documents. In short, the position is this. Under contract 1111, two types, both BOSA and Lenton couplers, had been approved. The question is whether Lenton's or BOSA's couplers are being used at the interface.

If we can first go to look at --

CHAIRMAN: Sorry to interrupt. As I saw it at the close of business yesterday, obviously it would have been better if everybody had known -- if the same couplers had been used, there would not have been a problem. But the problem was not so much the use of different couplers. The problem was that the people responsible for bar fixing and supplying the rebars weren't aware of the fact that there were the Lenton couplers, and therefore the reinforcing bars didn't have the necessary threading at the end.

So the core issue is a bar without the correct threading; would that be right?

MR CHOW: That's correct. But I would like to at least clarify the position in terms of design, in order to identify, at a later stage, which party has committed fault or not. So I would like to assist, just to clarify what is included in the design and what Leighton is supposed to be aware of at the time of the construction.

CHAIRMAN: Yes. Thank you.

MR CHOW: If I may refer you to MTR's submission, at

bundle DD7, page 10487, please. This is a submission made by the MTRC to the government on 30 November 2015, to which a number of QSPs and quality assurance schemes were attached.

Now, both BOSA's couplers and Lenton's couplers were submitted by MTRC under that submission.

Now, the first one, if you can go to page 10488, this is the first page of the quality assurance system for Lenton type 2.

If we turn over the page, go to the following page, we see at the bottom of the page:

"This submission only applicable to the following sizes of steel reinforcement bars in diameter:

32mm.

25mm.

20mm."

Then if we go to look at the corresponding QSP, starting at page 10599 -- this is the corresponding QSP. On the following page, 10600, at the bottom of the page -- now, this is in line with what is set out in the quality assurance scheme. Again, Leighton couplers are supposed to be used for diameters 32, 25 and 20.

If we go to another quality assurance scheme for BOSA's type II couplers, at page 10652, this is for BOSA's ductility couplers.

If we turn over the page to 10653, at the bottom it

is stated:

"This BD submission shall only refer to SCL contract 1111 Hung Hom North Approach Tunnels related works.

This submission only applicable to the following sizes of steel reinforcement bars in diameter:

40mm."

So, according to these various submissions, it is clear that the position is that, as far as the approval is concerned, two types of couplers have been approved to be used under contract 1111. Now, as to which type of couplers that has to be employed at a certain location, it all depends on the diameter of the reinforcing bar at that particular location, as shown in the design drawings.

If you go back to the interface, we have looked at joint 1 and joint 3. Joint 1 and joint 3 are two of the three stitch joints --

CHAIRMAN: Sorry, if you go back to where?

MR CHOW: Yesterday, we talked about issue 1. Issue 1 concerns three stitch joints.

CHAIRMAN: Yes.

MR CHOW: Joint 1 is the joint at the interface at the NSL Tunnel between contract 1111 and 1112. Joint 3 again is at the interface. However, joint 2, the one in between, is actually an internal stitch joint --

CHAIRMAN: Internal, yes.

MR CHOW: -- of NSL, where we should not have the problem of different types of couplers, because they are all BOSA.

So for joint 1 and joint 3, we need to look at the drawings, what size diameter of the rebar were being used under the accepted design.

In this connection, I would like to first of all establish the exact location of the interface first. I would like to refer the Commission to the drawing at bundle BB1/484.

Sir, this is a drawing that shows the profile along the NSL Tunnel. If we move a little bit to the centre of the drawings -- now, the lower part of the drawing shows the alignment, the elevation, which is a cross-sectional elevation of the tunnel, and in the middle of the drawing we see a vertical dotted line which shows the location of the interface, the interface between contract 1111 and 1112.

If we follow the dotted line down to the bottom, we see a figure. This is a chainage. Now, the chainage, for the present purposes, we can take it as -- a chainage is a reference point along the alignment of the tunnel.

CHAIRMAN: That's what a chainage is, is it?

MR CHOW: Yes.

CHAIRMAN: I didn't know, sorry.

MR CHOW: It's somewhere along the line of the tunnel, we

fix a reference point.

The relevant reference point here is chainage 100. So, at a certain location from this reference point, we will refer to that at chainage 100 plus a certain length away from this reference point.

So if we see the dotted line where the location of the interface is, it shows that the location is at chainage 100+466.289. It's about that point. That is the location of the interface. Then, having determined the location of the interface, we can go and look at the corresponding reinforcement details under the two contracts, to see what sort of diameter of reinforcing bars are being used at that location.

If I can then refer you to another drawing, in the same bundle, at page 481. Sir, you will see on this drawing, there are two cross-sections on the upper part of the drawing.

Now, the one on the right-hand side, you will see a box structure. This is a cross-section showing the box structure of the NSL Tunnel. The description underneath that section is, "Reinforcement details of double track tunnel expanded section due to stitch joint at NSL uptrack chainage 100+463.789 to chainage 100+465.289".

So this is a location very close to the interface. It's about 1 metre. So it shows the details of the

reinforcement to be provided at that location, and it also shows exactly the reinforcing details that we say are defective.

If you look at the cross-section, we see a lot of lines. First of all, we have the darker black line going around the perimeter of the cross-section. The dark black lines show the reinforcement. As you may be aware, the reinforcement runs in two directions. Under the dark black line, we see a lot of dots, the black dots. Now, the black dots represents reinforcement, another layer of reinforcement, running parallel with the alignment of the tunnel. So those black dots are the reinforcement that needs to be connected by couplers.

Those reinforcement which run around the perimeter of the box structure are self-contained; they don't need to be connected with the reinforcement from contract 1112. So what we should be focusing on is those black dots.

If you look at -- on this section we see a lot of arrows and a lot of figures. Can I just pick one as an example to explain what they are about? For example, if you look at the one right at the top corner, you will see "T16-150-300 links"; do you see that?

MR PENNICOTT: Yes.

MR CHOW: Right below that, you see there is another

description, "T40-150 T1". For that description, the T40, the first T denotes a high-yield reinforcing bar, and the 40 represents the diameter of the bar. The 150 actually is the spacing between the bars, and the T1 shows the first layer of the top mat.

So this is how we represent reinforcement, and this is the way we show to the steel fixers, as to how they should fix the reinforcement.

We see T40 -- if we go around the perimeter, we see a number of descriptions "T40" at the spacing of 150. The next one is the one in the middle, on the top, you will see we have another "T40", at the spacing of 150, and then the third one will be at the other end of the corner, on the left-hand corner, "T40". And the arrow that the description points to shows the relevant reinforcement. So you will see all these arrows which show T40 bars refers to the transverse reinforcement going alongside the perimeter of the box structure, and this reinforcement does not have to be connected by couplers.

What have to be connected are those black dots. If you look at those black dots, they are T20 -- T32, for example -- if you go back to the top part of the right-hand side, we see, in the middle, "T32-150 EF". The line refers to a cross, and the cross actually refers to the four reinforcements, two on the top and

two on the bottom. This is the way we represent reinforcement, reinforcing detail, which basically means that for all the black dots we see, they are T25 bars at 150 spacing.

COMMISSIONER HANSFORD: T32.

MR CHOW: Sorry, T32. We have similar description along the side and the inner wall of the cross-section.

What it means is, at the stitch joint, the bar, that needs to be connected by couplers, they are all T32.

COMMISSIONER HANSFORD: So what you are telling us, Mr Chow, is all the longitudinal bars are T32s?

MR CHOW: That's correct.

COMMISSIONER HANSFORD: And you've checked that in joints 2 and 3? Sorry, joints 1 and 3.

MR CHOW: Joints 1 and 3, that's correct.

COMMISSIONER HANSFORD: And they are all T32s?

MR CHOW: T32, yes.

COMMISSIONER HANSFORD: So, therefore, all of the couplers inserted at the interface, at the stitch joint interface, by contract 1111 will be 32s?

MR CHOW: That's correct.

COMMISSIONER HANSFORD: And therefore they will be Lentons?

MR CHOW: That's correct. This is one of the drawings for contract 1112. In other words, Leighton ought to be aware of that.

MR PENNICOTT: 1111.

COMMISSIONER HANSFORD: This is 1111, is it not?

MR CHOW: No, this is 1112.

COMMISSIONER HANSFORD: So how do we know the details are the same the other side of the interface?

MR CHOW: We can go to check the corresponding drawings under contract 1111, but as far as Leightons are concerned, to them, this is the kind of diameter that they need to provide.

COMMISSIONER HANSFORD: Yes, but if this is the Leighton one, then this is the BOSA -- even though they are the 32s, they would be BOSA?

MR CHOW: Well, the record that we see set out in the meeting minute of the interface meeting says that for T40, it is BOSA, but for the other bar diameters, it would be Lenton.

So, as far as Leightons are concerned, they knew that --

COMMISSIONER HANSFORD: No. I don't think that's quite correct. I think what we are hearing is that, at the interface, 1111 will provide Lenton couplers for T32 and below.

MR CHOW: Yes.

COMMISSIONER HANSFORD: And BOSA couplers for T40, but 1112 will provide BOSA for all diameters, and that's not inconsistent, because if you look at the detail, BB91 is the best reference because it shows the stitch joint

details; the 1112 reinforcement doesn't actually join the 1111 reinforcement, except through the pink part which is the stitch joint.

So it's quite consistent that you would have BOSA couplers in the left-hand side, which is the Leighton contract, and provided they are T32 or below diameter the couplers in the yellow part would be Lentons, and then the interface is made across the pink stitch joint. That would be my reading of this drawing.

MR CHOW: Yes. This is also consistent with my reading as well, Prof Hansford.

COMMISSIONER HANSFORD: Good.

MR CHOW: But on that reading, my understanding is the pink part was to be constructed by Leighton.

COMMISSIONER HANSFORD: Correct.

MR CHOW: So, in order to connect to the couplers on the right part, Leighton has to prepare appropriately threaded bar, which is a cone-shaped threaded bar --

COMMISSIONER HANSFORD: Yes.

MR CHOW: -- in order to connect into the Lenton couplers.

Now, given that under Leighton's drawing --

COMMISSIONER HANSFORD: We agree.

MR CHOW: Under Leighton's drawings, it clearly shows a diameter of the bar to be used, and together with what they have heard from the interface meeting, saying that for diameter 32 and below it would be Lenton, then

Leighton, as far as the government is concerned, ought to be aware that the cone-shaped threaded bar has to be prepared.

COMMISSIONER HANSFORD: Yes. The only question I had, Mr Chow, was the long sections you took us to, which showed us the reinforcement, just now, related to the blue part, and what we haven't seen -- sorry, can we go back to BB91 -- is a long section with reinforcement for the yellow part.

MR CHOW: That's correct. The section that I have just shown to the Commission actually covers a chainage from 100+463 to 100+465. This covers a range of -- a width of 2 metres. So that is the range, as far as I see, within the pink section.

COMMISSIONER HANSFORD: I see.

MR CHOW: My instructions are that this cross-section shows the reinforcement layout at the stitch joints. In other words, that is what Leighton has to fix --

COMMISSIONER HANSFORD: Okay.

MR CHOW: -- to do the stitch joint, and if we check the chainage, it is about right in terms of location.

COMMISSIONER HANSFORD: So therefore that would be the same reinforcement in 1112 and 1111?

MR CHOW: That's correct. This is my interpretation, Prof Hansford.

COMMISSIONER HANSFORD: Right. Subject to checking, that

makes sense.

MR CHOW: If we then go back to the same drawing, 481, on the left-top corner we see another section. This is joint 3, the cross-section showing a location very close to the interface and this shows a trough structure of the EWL slab.

If we look at the details of the reinforcement, they are all T32. So, again, for joint 3, only -- there was no T40 bar being used, and what follows is that the Lenton couplers would have been cast in by the contractor of contract 1111.

COMMISSIONER HANSFORD: Yes.

MR CHOW: Now, the position is slightly different in the case of the shunt neck joint. We only realised it last night when we went through some of the relevant drawings.

If I may then refer you to a drawing showing the alignment of the shunt neck joint, at bundle DD7/10381, please. Sorry, perhaps before that, 10374, please.

10374 is a similar layout drawing, showing the location of the interface, and we see that -- now, in the middle of the drawing, we see again a dotted line showing the location of the interface, and if we just follow the line going down and check the corresponding chainage, although we don't have the exact location, but we can tell that it is around chainage 0+31-something.

This is the rough location of the interface of the shunt neck joint.

Then we can go to look at the corresponding reinforcement detail. The first one, under contract 1111, bundle DD7, page 10381. Sir, you will see there are a number of cross-sections on the drawings. The relevant one is the one at the middle but to the right, which says, "Reinforcement of shunt neck trough HHS chainage 0+291 to chainage 0+312 approximately". Do you see that, the one in the middle of the page but to the right?

So if we blow up that particular section, we see that all the longitudinal bars are T25, except there is a layer of longitudinal bar on the slab; the top of the slab, the T2, is T40. The middle part is the slab, shows the cross-section of the slab. At the top reinforcement for the slab, we have two layers. First of all, we have the T1 layer, which is the top one, which is transverse reinforcement, T32; but the lower layer, T2, shows the diameter of the bar to be T40.

In other words, in the shunt neck joint, the longitudinal bar needs to be connected, a T40 bar.

If you then now go to look at the corresponding drawings, under contract 1112, at bundle BB1/538, the cross-section at the bottom of the page, again to the right. This is a cross-section shown almost at the same

location. This one is for the length from chainage 0+312 to chainage 0+323. The other one that we have just looked at is from +323 to further down the alignment.

We see that the top reinforcement, the second layer of the top reinforcement, is T25.

Both cross-sections, in a way, stop at chainage 0+323 -- no, 312 as the dividing line. If we recall that just now we looked at the layout plan, we know that the location of the interface is somewhere around 0+31-something. So the location of the interface should be very likely to be around 0+312.

Now, if this is the case, then we see that there is, in a way, mismatch between the reinforcement details under the two different contracts. Under contract 1111, the top layer of the longitudinal bar should be T40, whereas under contract 1112, it shows that it is 25.

Sir, you will recall that under the contract, originally, this joint is supposed to be a stitch joint. In other words, Leighton has to first of all connect to the couplers cast in under contract 1111 first, and then at the same time Leighton needs to provide another set of threaded bar connected to its own part of the structure. So that would be BOSA.

Even if we have different diameter sizes under two different contracts, that can still be achieved, because

on 1112 side Leighton can provide T25 bars, and then these T25 bars can be lapped with the T40 bars from the other side. But subsequently this stitch joint was changed to a construction joint. Again, it is a matter for the technical people to advise the Commission as to how they should go about it, but as far as I'm concerned that can still be achieved. The 40mm diameter bars sticking out from the interface can still be left with T25 bars.

I think that is as far as I can go. The purpose of my submission is just to show to the Commission what are the requirements in the contract drawings, and if there is any mismatch, this is the way that we can say there is some kind of mismatch, but technically perhaps it is not a problem at all. It all depends on how the contractor went on to execute the work.

Unless the Commission has any question for me on this particular question, then I will move on to provide an update.

(Discussion off the record)

If you have no questions on this aspect, I will move on --

CHAIRMAN: I was just being assured by my professional co-Commissioner that some of my indications that I was lagging behind on the technicalities will be made clear to me over coffee break.

MR CHOW: Thank you.

CHAIRMAN: That's one of the good things about having two of us sitting. We can enlighten each other in our own respective areas.

COMMISSIONER HANSFORD: That seems to be part of my role here.

MR CHOW: Thank you. Having said that, at any time, Mr Chairman, if you have any questions, I will try my best to assist.

CHAIRMAN: I appreciate that. Thank you.

MR CHOW: In that case I will move on to provide an update on progress of the works under the holistic assessment. Sir, you will recall that under the holistic assessment, the works are to be carried out in three stages.

CHAIRMAN: Yes.

MR CHOW: At the time when we concluded our evidence of the first part of the Inquiry, we were at stage 2, when opening work was being carried out at various locations of the platform slab. These locations were sampled on a statistical basis, and what we knew at that stage was we would have to expose at the minimum 168 coupler assemblies for verification and for measurement for the purpose of statistical analysis.

After those had been opened up, we would measure by a non-destructive method the engagement length, and that has been done. At the time when we concluded the first

part of the evidence, there was some problem as to the accuracy of the measurements taken up to that stage, and subsequently, upon further effort being put in by the technical personnel, they have revised the method and it has been improved, checked, and we are now satisfied that the final method of measurement used was reliable and all the exposed couplers have been re-measured.

The stage 2 investigation was largely completed on 29 April, last month. As the position stands, my instruction is that there were altogether 225 samples of coupler connections exposed for examination, and the result of the examination has already been uploaded on to the website of the Highways Department, and I understand that MTRC has also helpfully summarised it and updated it on a continuous basis in its report.

Just to give an overall account of the result, out of the 225 samples opened up, 152 of them show an engagement length of 37 millimetres or more, which are measured by our ultrasonic test, and 39 of them show an engagement of less than 37mm. There remain 34 samples. They were either -- after they were exposed, they were found to be not connected at all, therefore no measurement can be made. My understanding is it accounts for seven to eight number of them are not connected. As to the remaining 25 or 26 samples, the technicians were not able to measure or to produce

a valid reading.

What happened is, during this measurement process, the measurements were done by two separate technicians, doing exactly the same thing, and the reading would only be accepted as valid if both of them came up with a very similar measurement. Now, if the two technicians came up with different measurements with a deviation larger than a certain range, then we consider those readings as invalid, and my understanding is, out of these 34 samples, a number of them are of that type; two different technicians came up with different figures and we therefore ignore those readings. So this is the position.

Going back to the stage 3 structural assessment, the stage 3 structural assessment, according to the agreed holistic proposal, is to be made on the basis of the verification findings in stage 1 and stage 2. So the result of the opening-up and the measurement we have taken would be taken into account.

At the moment, the target date for the submission of a final report of stage 3 structural assessment is set on 30 June, ie the end of next month.

The government is as keen as MTR, if not more, to resolve the present problem and have the Shatin to Central Link commissioned and put in operation, and for this purpose, to avoid any unnecessary delay in stage 3

structural assessment, the government has set up a special taskforce in mid-April. Now, this taskforce is a different one, different than the one that Mr Khaw mentioned yesterday. Mr Khaw mentioned a taskforce set up to deal with the verification proposal, but a further taskforce has been set up in mid-April this year, just to handle the stage 3 structural assessment, and this special taskforce actually comprises the technical staff from the Buildings Department, from the Highways Department, and also from the expert adviser team.

This special taskforce holds almost daily meetings with the corresponding technical staff from MTRC, to discuss various matters relevant to the stage 3 assessment, in particular the design assumptions, the design parameters. The purpose is to avoid getting into a situation when the final report is produced by MTRC and then the government has to get into a big argument with MTRC on the validity of certain design parameters adopted in the assessment. So what the government did is to set up a taskforce, have continuous dialogue with the technical staff of MTRC, and also the consultants of MTRC, to agree on various design parameters and assumptions.

At the moment, almost all the design parameters and assumptions have been agreed, except one, and the one that remains outstanding actually relates to the

question of whether, and if so how, the ground support provided by the existing ground to the NSL slab are to be taken into account, because, sir, you will recall from the evidence of the first part of the Inquiry, we were told that actually NSL slab was cast on the ground. Although in terms of design, they were designed to be self-supported, in other words to be supported by the diaphragm wall, but in actual fact, when they were cast, there was ground underneath. So there is some discussion at the moment between the government's technical department and MTRC as to whether one can take into account the support from the ground during this construction stage, in the stage 3 assessment, and hopefully this can be agreed very quickly.

Regarding the structural assessment itself, this has been going on in parallel with the discussion between MTRC and the government. According to the agreed timetable between the government and MTRC, MTRC will produce a draft final report by the end of this month. In other words, in a few days' time. There are, however, two matters I would like to spend some time on, which I think would be of particular interest to the Commission. The first one relates to the adequacy of the connection between the east diaphragm wall and the EWL slab. I recall that Mr Chairman at the preliminary meeting actually mentioned it, because Mr Chairman

recalled the concern of Prof Au. In the first part of our Inquiry, Prof Au carried out a quick check and expressed concern as to the adequacy of the connection.

Sir, you will recall that in the first part of the Inquiry, we have been exploring two different design changes. My learned friend Mr Cheuk labelled it as a first change and a second change. The first change relates to the omission of a U-bar on top of the diaphragm wall and the second change is the change from a coupler connection to through-bar. But to implement the second change, Leighton actually hacked off part of the top of the diaphragm wall and then put in through-bar and then recast the remaining concrete as the second phase.

CHAIRMAN: Described occasionally as a monolithic pour.

MR CHOW: Exactly. This is what the discussion is about. But you will recall that one of the concerns of Prof Au is because of this operation, we have actually created an additional horizontal joint inside the connection, and Prof Au expressed concern about the adequacy of the joint because of that.

At the conclusion of the evidence, upon the invitation of the Commission and upon receipt of the base data from Atkins, Prof Au has carried out a quick check, structural design check, on the basis of the data provided by Atkins, and he has produced a report on

1 March 2019.

In short, Prof Au opines that there may be potential problems of excessive horizontal shear stress at the additional construction joint we have just mentioned, and also there may be excessive shear stress at some of the vertical critical shear plane close to the exterior surface of the diaphragm wall.

So Prof Au maintains the same concern, and in the report he recommended that a more sophisticated analysis or assessment has to be carried out. Now, this more sophisticated assessment has now been taken on board by MTR's consultants.

COMMISSIONER HANSFORD: Is this a finite element analysis?

MR CHOW: I am not 100 per cent sure, because I was not involved in the discussion.

COMMISSIONER HANSFORD: I'm just wondering what a more sophisticated assessment is.

MR CHOW: Probably yes, because --

COMMISSIONER HANSFORD: I believe it's a finite element analysis.

MR CHOW: Because as far as I understand, all these sophisticated computer programs are based on finite element, so inevitably I think the finite element analysis will be involved.

The important point is that now Prof Au's concern has been passed on to MTRC's consultants. As far as

I understand, there are three consultants involved: Atkins, Arup and AECOM. Prof Au's concern was explained in detail to the consultants, and I understand that the more sophisticated analysis will be done by the consultant and will form part of the stage 3 structural assessment. In other words, by the time when the Commission receives the stage 3 structural assessment final report, then the concerns of Prof Au should have been addressed. We are not in a position to foresee what is the result or whether any remedial work will be required, but what is important that we have to take note is Prof Au's concern has now been taken on board by the consultant and this more sophisticated analysis is being carried out.

The second matter, Mr Chairman, you have mentioned at the preliminary meeting, is the test to be performed on partially engaged couplers. There is always a question as to whether there is any contribution from the partially engaged couplers to the strength of the structure, and that was really the main disagreement during the first part of the evidence between the government and MTRC.

What happened is -- we have put down in our written opening, saying there is not much progress on this aspect of the disagreement. The government -- as I mentioned earlier, a special taskforce has been set up

since mid-April, so the government was aware that MTRC was going to carry out further tests on partially engaged couplers by the end of April, so last month. And the government has received a draft test plan for the partial engagement couplers from MTRC, also in mid-April.

In response to that, the government has provided its comments on the draft test plan, and since then, during the almost daily coordination meetings of the special taskforce, between the government and MTRC, the government asked for details of the test results that MTRC apparently has performed at the end of April, and the government expressed to MTRC that if MTRC intended to make use of the test results for the purpose of stage 3 structural assessment, those results have to be disclosed to the government, have to be tabled for discussion, and the requirement for test can be discussed and agreed.

My instruction is that until last Saturday, government received nothing from MTRC about that, and meanwhile, the consultant of MTRC has been proceeding with the stage 3 structural assessment on the basis that the partially engaged couplers were not giving any contribution. In other words, the partially engaged couplers were ignored in their structural assessment, up to last Saturday, two days ago.

Last Saturday --

CHAIRMAN: When you say "partially engaged couplers", you mean less than 35?

MR CHOW: Less than 37mm engagement length.

So this is what the consultant has been working on during the month of May or before May.

But last Saturday night we received, the government received, from MTRC, by email, copies of the test reports, about tests MTRC had performed back in April on couplers with various degrees of partial engagement. The government immediately wrote back to MTRC, seeking their clarification as to their intention with that test report. Meanwhile, the government observed from the test result of this second batch of tests, coupler tests, that the overwhelming majority of the test samples actually failed again the requirement, the code requirement, in relation to permanent elongation, which is not to be in excess of 0.1 millimetre.

While the government observed that the new test report shows that most of the samples still failed to comply with the code requirement, but we don't know why MTRC chose to pass on these further tests that had been done almost a month ago to the government, at this stage, two days before we commenced the substantive hearing. So we are yet to hear from MTRC as to what MTRC intends to do. Because, as far as government is

concerned, the consultants of MTRC have been proceeding with the stage 3 structural assessment on the assumption that the partially engaged couplers were to be ignored. So perhaps MTRC has a new plan, then this is something that we have to hear from MTRC.

COMMISSIONER HANSFORD: Because it must be the case, Mr Chow, mustn't it, that ignoring partially engaged couplers, with engagement less than 37 millimetres, is a very conservative approach?

MR CHOW: Prof Hansford, I am not actually in a position to give any opinion, but possibly, yes, if the partially engaged couplers are ignored. But again, from the evidence, there are concerns in relation to cracks, the development of cracks, the deformation, and that is something the experts have no doubt considered as well, which I am not in a position to advise or form any view on.

COMMISSIONER HANSFORD: Okay.

MR CHOW: So this is something that the MTRC -- if MTRC intends to make use of this test report for the purposes of stage 3, this is something that MTRC has to discuss with the government. Of course the government is open to different ideas, but we are concerned with timing because, according to the agreed timetable, the final report has to be issued by the end of next month, and the draft report is supposed to be ready by the end of

this week. So if we start looking into new things, then we have to think about the timetable as well.

That is all I can say at the moment. The government is open to discuss, but we have to hear from MTRC on that.

CHAIRMAN: All right. Sorry, this is not a criticism. I'm just trying to understand. I appreciate that all tests must have parameters. I would imagine the more sophisticated tests tend to have more sophisticated parameters, but I may be wrong; I'm not an engineer. But would it be then on the basis that a length less than 37 millimetres would be ignored, so that if you've got 37 millimetres, that would be accepted, but 36 millimetres --

COMMISSIONER HANSFORD: Or 36.9.

CHAIRMAN: -- or 36.9 millimetres -- means it's not helping the structural integrity of the structure one bit.

I'm not querying it. I accept there must be parameters. It just seems to me, as a complete layperson, that's a very small difference. Is there no gradation, or does it all suddenly stop at 37 millimetres and thereafter of no benefit whatsoever to the structural integrity?

MR CHOW: Sir, as a layperson, of course the answer is no, there must be some contribution, but at the same time I appreciate that a line has to be drawn somewhere.

It's a matter of where to draw that line. And if someone has --

CHAIRMAN: Or perhaps several lines can be drawn.

MR CHOW: Or several lines.

CHAIRMAN: You get decreasing percentages, for example. But again, I keep my ground.

MR CHOW: I fully appreciate that.

COMMISSIONER HANSFORD: I'm just observing this appears rather conservative.

MR CHOW: But this is something that the technical people from the two parties have to put their heads together to work out.

CHAIRMAN: And the other thing you mentioned is the elongation tests. Again, I'm not querying it, because no doubt it's going to be discussed, and it's absolutely for government and MTR to decide on what basis they wish to proceed. It's an independent exercise. But there was quite a bit of evidence saying that this particular type of test was actually not relevant, in the circumstances of the building of the structures.

I can remember, in my rather primitive way, talking about, in order to get into a government elite commando unit, you may have to be able to swim a mile underwater, but if in fact, having shown that ability, you then have to carry out a raid in the middle of a desert, the swimming a mile underwater is not really of great

relevance. Perhaps the ability to run up rocky hillsides is. Do you see the point?

MR CHOW: Yes.

CHAIRMAN: So one wonders, to some degree, about the appropriateness of particular tests for the particular circumstances. Again, I just mention that. That's all. I don't query it. I just remember that being raised.

MR CHOW: Yes. We take note of that. As I mentioned earlier, the government actually welcomes further discussion. That's why, during the taskforce meetings, we have been asking MTRC about the test result and whether MTRC intends to make use of the test results, and at the moment we are concerned with the timing only. But, having said that, my instructions are that the latest test plan that we received yesterday is now being considered by the government.

I also mentioned that an earlier version of the test plan has been commented by the government, and we are now looking at the revised test plan to see whether our comments have been fully addressed.

These new documents only came in on Saturday night and I would expect that the government will act immediately and look at the details, then we will go back to MTRC.

But first of all we need to have an indication from MTRC as to what is their intention with the test results

and what they plan to do. Dialogue is very important and that's the reason why a taskforce is set up and that's the reason why daily meetings were held, to facilitate and to speed up the stage 3 structural analysis.

The fact is that we are a few days away from a draft report, having to produce, and a little bit more than a month before the final report has to be submitted to the Commission, and of course the government is willing to work closely with the MTRC to achieve that target, but it takes two to cooperate.

CHAIRMAN: Yes. Thank you very much.

MR CHOW: Sir, I think that is all I intended to say by way of an update. Unless, sir, you have any questions for me on that, this is my submission.

MR PENNICOTT: Sir, before we go on -- I think it's Mr Shieh next -- can I just make a couple of observations?

As we all know, we are here for this hearing to listen to the opening submissions and then the evidence in relation to the extended part of the Inquiry. Whilst I have no problem with Mr Chow giving the Commission an update, as he has done over the last half an hour or so, on what's happening in relation to the holistic proposal, Mr Chow having done so and raised the sorts of points that he has, no doubt the MTRC are going to want to respond in some fashion, which of course they are

perfectly entitled to do.

My concern is that we are working under a pretty tight timetable, with a lot of witnesses coming, with a lot of growing issues about availability of witnesses, and it does, with respect, seem to me that if the government and the MTRC wish to discuss with the Commission matters not directly connected with the extended part of the Inquiry, then an indication should be given to the Commission, either through me or through those instructing me, and we can perhaps find time, half an hour or an hour, at the end of the day, between 5 and 6 o'clock, or whatever it might be, to listen to that material.

But we cannot, in my respectful submission, have too much time taken away from us in relation to what we are supposed to be dealing with. It's not a criticism of Mr Chow, because I accept entirely that the Commission does need to be updated, but I just think we need to bear that in mind, if I may say so.

CHAIRMAN: All right. Thank you.

Good.

MR PENNICOTT: So it's Mr Shieh, I think.

MR SHIEH: Yes, I am next in line. I hope I can be forgiven for still being seated when I address the Commission. I can start now or I can start after the mid-morning break, if the Commission --

CHAIRMAN: Again, these are your submissions and we're happy to go with how you would best like to proceed.

MR SHIEH: I would wish to proceed, if it suits the Commission.

CHAIRMAN: Good. Thank you.

Opening submissions by MR SHIEH

MR SHIEH: The Commission will have read our written opening. I don't propose to go through them. I propose to make five points on five topics.

First, issues of connection have been identified or discovered in the stitch joints and at the shunt neck joint. One of the issues or one contributing factor to the issues of connection was what has been called the material mismatch or the shape mismatch between BOSA rebars and Lenton couplers on the interface of 1111 and 1112.

As Leighton's witness statement acknowledged, there had been issues of communication internally, within Leighton, where personnel who attended interface meetings were aware of the possible use of Lenton couplers but had not communicated that to the engineering staff. We have squarely acknowledged that. And during the inspection process, opportunities of spotting any issues of connection had been missed, during routine inspection and hold-point inspection.

So that is the shape of the evidence broadly in

relation to that aspect of the issues concerning the interface.

There are other possible causes or reasons identified in the evidence for difficulty or impossibility of fixing rebars into couplers. I name, by way of example, some couplers are said to have been not completely hacked off from concrete, so that the couplers were not fully exposed. That's one cause which has been mentioned in the evidence. Another cause of the difficulty or impossibility of fixing the rebar was what has been called the size mismatch, because apart from the shape mismatch we have seen some evidence in relation to a size mismatch, in the sense that the bars were too thin or too narrow for the couplers. I believe that related to the shunt neck joint.

There are also suggestions that there might have been couplers which were damaged, which therefore made connection difficult or impossible.

Now, evidence on those aspects is, I would acknowledge, a little bit murky. From Leighton's perspective, Leighton witnesses have explained and testified in their witness statements, as far as they are concerned, they are not aware of any issues or difficulties over connection during the construction process. But of course, as the matter goes on, we would continue to explore that with our witnesses, and no

doubt these would be explored with them when they are in the box for cross-examination.

But if we were to stand back, these difficulties or impossibility of fixing the rebar, whether it is because of the shape mismatch or size mismatch, in our submission, were not the reason for the actual inadequate connection or non-connection. The reason for the actual non-connection or inadequate connection, in our submission, was the act or omission of the rebar fixers, that is Wing & Kwong, in actually doing the physical work. That, in our submission, was the cause for the issue.

Now, Wing & Kwong obviously has its own version of events which we have heard from Mr Tsoi, and the Commission will know that we have a classic case of a collision in the witnesses' oral testimony, on which I prefer to say little because these are obviously matters which will be tested rather severely in cross-examination, but suffice it to say, in terms of what was actually said or not said, or instructed or reported during the actual fixing process, it really is a matter of clash of oral testimony.

The reasons, the different reasons, as to why there were these impossibilities, were useful by way of background, and if one were to attribute any earlier responsibility, the Commission may well wish to look at

that, but the immediate reason for non-connection or inadequate connection was Wing & Kwong's act or omission in not fixing.

That is my observation on the first point, namely the issues concerning non-connection or inadequate connection.

The next big topic I address is what's been called issue 3, issues concerning RISC forms. It has been loosely called, in some quarters, "missing RISC forms". I prefer to call that "outstanding RISC forms" because of a subtle difference: because if one calls someone missing, a missing person, you presuppose a person existed in the first place before he can be made missing, with a rather sinister connotation that he has been somehow destructed. On Leighton's evidence, the RISC forms which cannot be found were not missing, they were outstanding, for the simple reason, as frankly acknowledged by Leighton's witness testimony, the relevant engineering staff were too overwhelmed and busy with their workload.

One can make submissions as to whether that's good enough or not good enough as a matter of management, but in our submission the absence of RISC forms does not mean that, as a matter of primary fact, the requisite inspection has not taken place, or that the requisite inspection and permission has not in fact been given

before the pouring took place. There is evidence both from Leighton and from MTRC as to, as a matter of fact, the inspection and permission-seeking process that had been gone through when the relevant hold points were reached. Again, that would be a matter of primary witness testimony that the Commission would have to consider.

So that is what I have to say in respect of the second big point, the question about outstanding RISC forms.

The third big point relates to material testing. The Commission will be aware that all the rebars used on site would have had test certificates issued by their manufacturers. So it's not as if there were no quality checks on the rebars delivered to site.

What happens is that additional testing in Hong Kong was supposed to be done by sample on the rebars delivered on site by a HOKLAS accredited laboratory. On Leighton's calculation or reckoning, about 7 per cent of the rebars delivered to site were not so tested by sample. In our submission, it has no bearing on safety because, first of all, as I said, this is not to say that the rebars have not already been tested by the manufacturers, as evidenced by their relevant test certificates. Secondly, Leighton will be putting forward evidence of an expert which hopefully should

assist the Commission in viewing the significance or the lack of significance of the testing of this 7 per cent of rebars in the overall scheme of things. But, as directed by the Commission when the time comes, when the report is ready, we will put forward the report in the usual way to seek leave, but all I need to say now is, yes, Leighton has in mind adducing expert evidence on that.

So that is my address on the third big topic, material testing.

On the fourth topic, that is the alleged design change, the Commission is aware that there is this question about couplers versus lapping. The Commission will remember, or it might have been so long ago that one might have forgotten, the evidence, there is technical evidence, that in the present context couplers and lappings are interchangeable. Certainly there is no suggestion, in terms of the evidence that we have been able to see for the purpose of part 2 of the Inquiry, that somehow, as a matter of principle, one is superior to the other. And the approved drawings and the approved designs, they did not stipulate precisely whether or not couplers or lappings are to be used.

So it is Leighton's submission that it really boils down to a matter of judgment whether to use one or the other, so to have used couplers instead of lap is really

a matter of detail, a matter of judgment, which in our submission would not have impacted on safety and would not have required consultation or approval by the Buildings Department. So that is our position on the fourth big point.

On the fifth point, that is the applicability of QSP, the Commission would have read our submission, and the government classified our stance as being a re-run of the points that we had put forward before the Commission during part 1.

Now, I have a few observations to make in that regard. First, as we read it, the Commission had not rejected, as a matter of principle, the submission that we had made in part 1, namely the requirement for QSP depended upon whether or not there is a requirement for ductility. Secondly, the Commission, in part 1, attached some weight on the fact that Leighton seem to have thought or acknowledged within itself that QSP is applicable.

Now, we would wish to urge upon the Commission, at this part 2 hearing, that there is a difference between, on the one hand, a party thinking to itself that it was subject to a higher or more onerous requirement, which may be more than is necessary under the regulatory regime. There's a difference between this, on the one hand, and, two, a party really being under a regulatory

requirement to adhere to a higher threshold. If it is merely the former, then the fact that a party has failed to meet its internally imposed higher threshold -- it may be a matter of failing to meet that party's own high standard, but it does not mean that it had not acted within the regulatory framework, according to the rule -- but if, as a matter of regulatory regime, there is indeed a requirement, then of course that party had to act in accordance with it.

It is a matter, in our submission, of some fundamental importance in public administration as to the applicability of a certain regime that if it is regarded as a re-run, then in our submission so be it. The Commission's view taken at the interim report is, in our submission, only an interim one, and we hope, at this stage too, we would be able to persuade the Commission to come to a firmer view as to the in-principle applicability of the higher threshold QSP to the facts of this case.

We note from the government's submission, and to a certain extent the Commission's submission, that they do not seem to be taking the position that simply because a party had somehow thought that it needed to adhere to a QSP or it had prepared a QSP, then therefore, as a matter of regulatory regime, it had to be subject to a QSP.

For example, the government seems to be taking the view that the line may be drawn at whether or not ductile couplers were in fact used. We take issue with that. We say the question turns on whether there is a ductility requirement. But the point I make is that even the government seem to accept that the requirement of QSP hinges upon satisfaction of some prerequisite, as a matter of regulatory regime, rather than whether or not a party itself, for whatever reason, had prepared a QSP. I hope the distinction is adequately drawn, but if not then we hope to be able to develop that by way of closing submissions.

We will be obviously looking at the plans again to see whether or not, as a matter of proper reading, they impose a requirement of ductile couplers. The Commission will recall that there is a difference between being subject to a requirement to use ductile couplers on the one hand and on the other hand not subject to such a requirement but it so happened that a party had, as a matter of fact, used ductile couplers. These are matters of detailed submission. But since the Commission has asked for assistance, I would simply wish to outline the stance taken by Leighton in this part 2. If it appears to be a re-run, so be it. We are seeking to persuade the Commission to consider our submissions in greater detail.

CHAIRMAN: It's an interim report that exists, it's not a final report, so obviously we are open to submissions of that kind. How we accept the submissions is another matter, but we are open to these submissions.

MR SHIEH: We are very grateful.

So these are the five big topics that I wish to address the Commission on by way of opening address.

CHAIRMAN: Good. Thank you.

Then who is going to be next?

MR BOULDING: I am next, sir.

CHAIRMAN: Mr Boulding, good. How long for coffee?

MR PENNICOTT: 15 minutes.

CHAIRMAN: 15 minutes. Thank you.

(11.20 am)

(A short adjournment)

(11.40 am)

Opening submissions by MR BOULDING

MR BOULDING: Good morning, Chairman, good morning, Professor, may it please you.

This is the MTR opening, and you will not be surprised to hear that I do not intend to repeat my written opening. What I want to do is to emphasise what I regard as certain important points in that opening, and of course to deal with one or two points arising from my learned friend's opening.

I ought to say immediately that, having listened to

Mr Chow's opening this morning and his update, I am not in a position to say whether or not that is correct, but you will not be surprised to hear that those instructing me are considering the transcript now with a view to giving me instructions on that.

The one thing I do agree is that we shouldn't lose any time dealing with that matter in the ordinary sitting hours, and as Mr Pennicott suggests, to the extent we need to trouble you on that, it ought to be outside the sitting hours, providing that's convenient to you.

CHAIRMAN: Yes, certainly.

MR PENNICOTT: Sir, can I just say on that point, there was an additional point I should have made earlier.

Of course there are three involved parties who are not here, who may have an interest in that aspect of the discussion. Of course we can, as we will, as a matter of courtesy, inform those three involved parties who are not here that there has been some discussion and they may wish to read the transcript, but I also bear in mind the fact that we don't have everybody here who may be interested in the discussion.

CHAIRMAN: Thank you.

MR BOULDING: That's an important observation.

Notwithstanding what I've said already, I'm going to concentrate on the following three issues, in respect of

the North Approach Tunnel, the South Approach Tunnel, and the Hung Hom Stabling Sidings. First of all, we have issue 1, and that of course involves the three defective stitch joints at the North Approach Tunnel. Two of these joints are located at the North South Line Tunnel level, and one is located at the East West Line Tunnel level. The latter stitch joint is known as joint 3, that was Mr Pennicott's references, and the two other joints, located at the North South Line Tunnel level, are joints 1 and 2.

Turning to the location of joint 3, its specific location is at the interface between the East West Line bay 5 under contract 1112 and the East West Line Tunnel structures under contract 1111.

What about the two stitch joints in the North South Line Tunnel? Well, joint 1 is located at the interface between North South Line bay 6/7 under contract 1112 and the North South Line Tunnel structures under contract 1111, and joint 2 -- again using Mr Pennicott's numbers -- is located at the interface between contract 1112 between the North South Line bay 5 and North South Line bay 6/7.

Now, it's not disputed that these three stitch joints were all constructed by Leighton and its following sub-contractors: firstly, Wing & Kwong Steel Engineering, they carried out the rebar cutting, the

bending and fixing; and secondly, Hills Construction Ltd, who carried out the formwork and concreting. That's issue 1.

Issue 2, in summary, concerns non-compliance issues at the North Approach Tunnel shunt neck, and then issue 3, two matters essentially, the alleged lack of inspection and supervisory records, ie the RISC forms, that's the first element of issue 3; and the second one is the alleged deviations at the North Approach Tunnel, the South Approach Tunnel and the Hung Hom Stabling Sidings.

The Commission of Inquiry has already been educated as to the sort of organisation MTR is, its roles and responsibilities under the entrustment agreement, and the various project management systems it has in place. That all occurred in part 1 of the Commission of Inquiry, and you will not be surprised to hear that I'm not going to go back over old ground there.

What I do want to do, though, is to concentrate on new factual matters which are relevant to issues 1 to 3 inclusive in this extended Commission of Inquiry. In doing so, some points have already been covered in varying degrees of detail by my learned friends, but where they are important points they do bear repetition.

First of all, I would like to deal with the construction of the North Approach Tunnel. The North

Approach Tunnel consists of three parts. Firstly, the North South Line Tunnel, and that we've heard is a twin-boxed underground tunnel. Secondly, the East West Line Tunnel, and that by contrast is an open trough, aboveground tunnel. And finally, the third element, the shunt neck, and we know that that connects the East West Line to the Hung Hom Stabling Sidings.

Not surprisingly -- and you've heard this already -- the construction of these structures required collaboration between Leighton, under contract 1112, and the Gammon-Kaden joint venture under contract 1111. Now, as touched upon already, you will know that the purpose of a stitch joint is to minimise the potential for stress or pressure at a joint where there is a possibility of different degrees of settlement or movement.

For example, that could occur where concrete structures which are on either side of a joint and which are connected were built on different foundations, as in the case of joint 2. Alternatively, where one of the two concrete structures which are to be joined was constructed well in advance of the other, as was the case in joint 3 and joint 1.

Now, it bears emphasis in this context, that the North South Line bay 5 tunnel structures were supported by socket H-piles, whereas the North South Line bay 6/7

structures were at grade. Now, as for joint 3 and joint 1, the interfacing tunnel structures were all built at grade, but the tunnel structures under contract 1111 were constructed well ahead of the tunnel structures under contract 1112.

What about the connection details and the interface requirements for these stitch joints? These are set out, conveniently, in appendix Z2 to the Particular Specification for contract 1112. For the reference, that's BB1/420 to 432. But there are also a number of relevant working drawings. I don't intend you to go to those, but I can tell you that the matter is spoken to in some detail by MTR's Mr Michael Fu, in particular in paragraph 14 of his statement. That's page BB/70.

In terms of understanding the defects in the three stitch joints, it is important, in our submission, to note various points. First of all, for the contract 1111 tunnel structures, the GKJV used Lenton couplers which, as we've heard, was based on a taper-threaded splicing system, requiring, not surprisingly, taper-threaded rebars.

For the contract 1112 tunnel structures, Leighton used BOSA couplers, as in the construction of the Hung Hom Station box structure, which required the use of cylindrically threaded rebars. Now, the practical consequence of this was at the 1111/1112 stitch joints,

which of course are Mr Pennicott's joints 1 and 2. That consisted of an interface between the Lenton couplers and the threaded rebars which were required for such couplers and the BOSA couplers, and of course the threaded rebars which were required to fit into those couplers.

What about the construction sequence? I think this was something touched upon by Mr Pennicott yesterday. Using the 1111/1112 North South Line, that's joint 1, as an example, the construction sequence was at follows. First of all, GKJV constructed the contract 1111 North South Line Tunnel structures with Lenton couplers fixed at the end of a structure. Then Leighton constructed the contract 1112 North South Line Tunnel structures with BOSA couplers fixed at the end of a structure.

Both structures required a collar on the exterior with an external waterproof membrane and, in addition, a waterstop. Moreover, what's termed an Omega seal had to be installed at the inner intersection of the two collars, and this was also intended to prevent leakage.

What happened then is that the stitch joint would be constructed by Leighton and its sub-contractors after the differential movements of the two connecting structures had stabilised. There's a note to that effect on working drawing 1112/W/000/ATK/C11/101A, conveniently found in the bundle at BB/433.

I point out that hydrophilic strips had to be installed on the internal surface of the connecting structures to ensure the necessary waterproofing qualities.

As you've heard, to construct the stitch joint, Leighton had to expose the Lenton couplers fixed at the end of the contract 1111 North South Line Tunnel structures for its sub-contractor, Wing & Kwong, to install starter bars. What happened then is that Leighton would expose the BOSA couplers fixed at the end of the contract 1112 North South Line Tunnel structures, again for Wing & Kwong to install the starter bars. Then, finally, the contract 1111 rebars would be lapped with the contract 1112 rebars.

A question arose, I think yesterday, as to the diameter of the rebars used at the interface, and on our reading of the evidence, for joints 1 and 3, T40 rebars were used for the BOSA couplers, whereas the Lenton couplers were used for rebars under 40 millimetres nominal bar diameter.

In that regard, I am quoting, in the first instance, from paragraph 29 of the fifth statement of Leighton's Mr Karl Speed. That's CC1/59. I also have in mind paragraph 27 of the second statement of BD's Mr Lok Pui Fai. That's DD/10279. He actually refers to T20 and T32 rebars.

I was a little bit surprised this morning to hear what Mr Chow had to say, because it appeared to us that he was seeking to depart from that evidence. We will simply have to see how that develops in due course. But in any event, this rebar lapping had to be done for the connection of the base slabs, the roof slabs, the external walls and finally the dividing walls, and of course after all that the concrete would be poured by Leighton's relevant sub-contractor, Hills Construction Ltd.

Now, this construction sequence, which I have given you as an example, similarly applied to joint 3. That's the contract 1111/1112 East West Line stitch joint. Now, the only difference is that there were no roof slabs or dividing walls to connect. This of course was due to the fact that it was indeed an open-trough tunnel structure.

As for joint 2, again, the construction sequence, which I've described in a little bit of detail, applied to joint 2, except in this case Leightons were responsible for constructing both sides of the joint under contract 1112 using, as I've told you already, BOSA couplers.

That's the three stitch joints, but we also know that there was a construction joint located at the shunt neck, at the interface between shunt neck bay 3 under

contract 1112 and the shunt neck structures under contract 1111.

Now, there are two or three points to note on this. This joint was originally designed to be a stitch joint, and we can look at the working drawings in due course at pages BB/435 and BB/436. No need to turn them up at the moment. But in the event, this stitch joint, the original design, was unnecessary, because the interfacing structures under contract 1111 and contract 1112 were all founded on piles, and the consequence of this was that they were not subject to any soil overburden pressure. This meant that a construction joint was sufficient.

Now, as a result of this, and as one would expect, MTR confirmed to GKJV that the joint would be constructed as a construction joint. If you want a reference for that, it's paragraph 3.6 of the report entitled, "Shunt neck connection report at 1111/1112 interface of NAT structure contract 1112". That was dated 26 October 2018 and can be found at pages DD1/38.64 to 38.65.

But that wasn't the end of the matter, because such fact was also confirmed to Leightons when an email from MTR's Mr Louis Lam, who was a senior design management engineer, sent an email dated 25 November 2015; that's CC6/3355-3356. That was in fact forwarded, as we can

see if we looked it up, to the GKJV, who sent it on to Leightons.

In addition, that a construction joint was not a stitch joint -- that a construction joint and not a stitch joint was required was reiterated in the response to Leighton's RFI, request for information, number 1112-RFI-LCA-CS-001510 -- that's CC6/3333-3341 -- which was raised in May 2016 and concerned a working drawing which showed the contracts 1111/1112 East West Line stitch joint -- that's joint 3 -- and the shunt neck, and in that response the MTR made it palpably obvious that there would be no stitch joint at the shunt neck except at the interface with 1111.

So what they were saying, in response to that RFI, is that a stitch joint was still required for contracts 1111/1112 East West Line stitch joint -- that's joint 3 -- but not for the shunt neck. If that wasn't clear enough already, this is helpfully acknowledged by Leighton's Mr Karl Speed in paragraphs 61 to 62 of his fifth witness statement. That's CC1/66.

Now, as with the contracts 1111/1112 stitch joints, that's joints 1 and 3, GKJV used Lenton couplers for the contract 1111 shunt neck structures. This had the following consequences. Firstly, the contracts 1111/1112 shunt neck construction joint also consisted of an interface, and at this interface Leighton was

required to screw Lenton threaded rebars into the Lenton couplers fixed by GKJV at the contract 1111 shunt neck structures. That's a matter you have heard something about already.

Now, what about the timing of the construction? This is helpfully dealt with at paragraph 1.7 of a report entitled, "Report on defective works identified at tunnel stitch joints", dated 26 March 2018. That's page AA1/57. First of all, the joint 3, that's the shunt neck construction joint and the contracts 1111/1112 East West Line stitch joint, was constructed from around January to March 2017.

The contracts 1112/1112 North South Line stitch joint -- that's joint 1 -- was constructed from around May to September 2017.

Finally, the contracts 1111/1112 North South Line stitch joint -- Mr Pennicott's joint 1 -- was constructed from around July to August 2017.

In this context, it should be pointed out that a more detailed North Approach Tunnel pour summary has indeed been provided to the Commission of Inquiry. That's BB9/6363.

So what about the South Approach Tunnel then? Well, the South Approach Tunnel was also constructed by Leighton and its sub-contractors, but in this instance the sub-contractors were Fang Sheung Construction

Company; they carried out rebar cutting, bending and fixing -- I understand we are going to hear from their relevant witness later today -- and China Technology Corporation Ltd, formwork and concreting; they are well known to you because they played a large part in part 1 of the Commission of Inquiry.

Now, these construction works were carried out from around November 2015 to February 2017, quite a long period, and these dates, these construction dates, are evidenced by the South Approach Tunnel pour summary which has also been provided to the Commission of Inquiry. That's BB13/8816.

Now, what did the South Approach Tunnel consist of? There were essentially three elements. Firstly, the East West Line -- which as I've said is an open-trough structure -- secondly, what are referred to as the launching and retrieval tracks, and these connect the East West Line with the Hung Hom Stabling Sidings; and finally, the North South Line which, as I've said, is a box-section structure.

I ought to emphasise that certainly at this time MTR is not aware of any structural safety issues concerning the South Approach Tunnel.

Finally, I move on to the construction of the Hung Hom Stabling Sidings. These works were carried out by Leightons and its various sub-contractors from around

December 2014 to May 2017. As you will have noted on your view, the stabling sidings cover a large geographical area, and not least because of that fact, MTR is still in the process of preparing the Hung Hom Stabling Sidings pour summary, but you will get that as soon as it's been prepared.

As you probably saw, this stabling sidings consists of essentially seven elements of work. Firstly, the underpinning works; secondly, stabling siding tracks; thirdly, what's referred to as the North Fan Area, which connects the siding tracks with the East West Line mainline in the North Approach Tunnel; fourthly, two launching and retrieval tracks -- I've just told you what they are for; fifthly, eight accommodation blocks, I'm sure you were shown those if you had the same site view as I had; two underpasses between the stabling sidings; and lastly what's referred to as the emergency vehicular access.

Now, MTR's Kit Chan's witness statement -- see in particular paragraph 16; reference, that's BB8/5190 to 5191 -- he helpfully explains that the steps and procedures for the construction of these key structures within the stabling sidings areas are set out, as one might expect, firstly in the method statements and secondly in what are referred to as inspection and test plans, which Mr Kit Chan helpfully summarises.

At this time, I'm happy to tell you that there is no issue concerning the structural safety of the Hung Hom Stabling Sidings, certainly that MTR is aware of anyway.

Now I'd like to tell you a little bit about MTR's site surveillance and inspection process, and of course in due course there will be detailed evidence on this, but for the time being I'd like to point out that MTR's construction engineers and inspectors of works carried out, firstly, routine site surveillance. That's what is referred to, and that's in accordance with paragraph 5.7.1 of both versions A5 and A6 of PIMS, a document which I'm sure you are still familiar with as a result of the abundance of evidence we had on it during the part 1 hearing.

Secondly, there are what is called hold-point inspections, in accordance with the inspection and test plans that I've already referred to. This is something that Kit Chan speaks to.

Now, this site surveillance and the hold-point inspections were carried out in respect of the construction works at the North Approach Tunnel, the South Approach Tunnel, and of course the Hung Hom Stabling Sidings, and there are indeed lists of current and former MTR officers involved in the checking, inspecting and testing of rebars and couplers for each of those structures. That's at BB3/1796. I shan't

trouble you with that at the moment.

I would like to say just a little bit more about both elements of this. Firstly, routine site surveillance. This was the primary responsibility of the MTR inspectors of works team, and the daily surveillance involved monitoring the day-to-day site work of both Leightons and its sub-contractors. Against, Mr Kit Chan's evidence is in point, as indeed, in this instance, is the evidence of MTR's Mr Fu Yin Chit. The references respectively to those witness statements are BB8/5191 and 5194, and BB8/5218-5219. They both explain that the daily site surveillance typically covered, firstly, the general works being constructed/installed; secondly, the general progress of site works; thirdly, general site management; and finally and importantly, as you've heard from a number of MTR witnesses in the past, safety. And the relevant inspector of works -- he's a gentleman called Tony Tang, and you will hear from him in due course -- explains that if during the surveillance he observed any issue relating to the spacing or the size of the rebars being fixed, or the coupler splicing assemblies, he would immediately raise it with the workers on site and, moreover, report the matter to MTR's senior inspector of works and/or the MTR construction engineers.

It bears emphasis that the MTR construction

engineering team also conducted site surveillance by means of what I'll refer to as regular site walks. Again, that evidence comes in the form of Mr Kit Chan's statement and Mr Fu Yin Kit's statement, BB8/5191 and BB8/5218-5219 again. They also say, you will not be surprised to hear, I'm sure, that they would raise the matter with Leighton if they observed any issues; for example, with the installation of couplers.

In this regard, Mr Chris Chan of MTR's evidence is in point -- that's BB1/116 -- as is a Mr Sebastian Kong who you'll hear from in due course; he was a graduate engineer, a very bright chap -- BB8/5244-5246.

But it didn't stop there because, in addition, MTR staff also made ad hoc visits at Leighton's request to resolve specific site issues. Examples would be safety, utilities or operations. And they also made site visits for a specific purpose and at a specific location, again at Leighton's request. And MTR's Chris Chan deals with this in a little bit of detail at BB1/116.

MTR takes this opportunity to emphasise, as indeed it did at the last hearing, that it was not its responsibility to conduct any man-marking or, moreover, continuous supervision over the rebar fixers when they were conducting their works. I submit that the project manager's expert opinion, that MTR was not expected to conduct any man-marking during the East West Line/North

South Line slab works -- that's paragraphs 26 to 27 of their joint statement; ER1/9/T-4 -- is equally applicable to the North Approach Tunnel, the South Approach Tunnel, and the Hung Hom stabling siding works.

Now, that's site surveyors, but what about hold-point inspections? The most relevant hold-point inspections for the three stitch joints and the shunt neck construction joint were, firstly, the rebar fixing inspections and, secondly, the pre-pour checks.

I think you would probably like to be told what the relevant procedure was, so I'm going to tell you. What happened was that when Leighton's works reached a hold point, Leighton should have submitted a request for inspection/survey check form, which you will now know is abbreviated to "a RISC form", and this should have done to MTR's administrative assistants, and indeed when they were produced, they went to MTR's administrative assistants. Leighton candidly accepts, as you have probably read in their statements already, that due to staff shortages it was constantly late in submitting RISC forms, and indeed, in many instances, it didn't submit them at all.

Notwithstanding this, if and when Leighton submitted the RISC form, it would then be passed on by the administrative assistants to MTR's senior inspector of works for him to distribute the form to the relevant

inspector of works or the construction engineers to conduct an inspection for their respective areas because, as you probably recall from the last hearing, certain different inspectors, certain different engineers, covered different areas. This was indeed a big site.

Now, once MTR's inspector of works or the construction engineer had completed the inspection, he would fill in his part of the form, and that happened to be parts B and C. In due course, I'm sure we will look at these in a little bit of detail.

The senior inspector of works would then endorse the RISC form and return it to Leightons. Leightons then took the process over, and they signed off what was called, and I quote, the "contractor's confirmation of receipt", and this was located at the bottom of the RISC form, and they then returned the pink and yellow carbon copies to MTR. You've probably read somewhere that there were four copies, all in different colours, but anyway, the pink and the yellow carbon copies went back to MTR.

The MTR construction engineers, and they will tell you this, were typically responsible for inspecting the rebar fixing works, and the reason for this is that they had the most up-to-date working drawings and the relevant design amendment sheets and the RFI responses.

This was important because all of these documents, in particular the amendment sheets and the RFI responses, were used to check the diameter, spacing, layering and lap length of the rebars, and the arrangement of starter bars, if indeed there were any, and again the shear links, if there were any. These inspections were -- and they will tell you this -- in relative terms a simple and straightforward matter.

The MTR inspectors of works would assist with the rebar fixing inspections when requested to do so by the construction engineers, but these inspectors of works routinely carried out other hold-point inspections at a number of stages. These inspections included the following matters: concrete blinding, waterproofing, cathodic protection, formwork, and finally pre-pour checks, which focus particularly on checking for cleanliness and debris. In addition, they will tell you that they took and kept photographs of their inspections.

Now, what about the situation, you are probably saying to yourself, when a RISC form was not submitted by Leighton or it was late? What happened so far as the relevant hold-point inspections are concerned?

Well, the evidence is that MTR's inspectorate staff performed the necessary hold-point inspections based on Leighton's verbal notifications. You have probably read

that Leighton would often pick up the phone, phone up their opposite number and say, "We are ready for an inspection, please come along and inspect." This evidence is corroborated by many, many of Leighton's witnesses who give evidence in virtually identical terms, and having inspected, the MTR witnesses say, the permission to proceed was mostly given verbally by MTR to Leightons.

Now, what about the quality supervision plan? This was a matter raised by Mr Pennicott yesterday, and Mr Chow also raised it I think this morning. Of course, you have invited the involved parties to clarify the position in relation to the QSPs for the relevant areas of works that we are talking about, and Mr Pennicott pointed out yesterday that we touched upon it in our opening and at that stage we were checking the position.

I am now in a position to firm up on where we are. In relation to the Hung Hom Stabling Sidings, I point out that the relevant acceptance letters for the Hung Hom Stabling Sidings can be found at exhibits LPF-32 to LPF-36. That's DD8/DD11433-11646, and these are referred to in paragraph 11 of the fourth witness statement of BD's Mr Lok Pui Fai. That's DD7/DD10294-10295.

CHAIRMAN: Sorry, "relevant acceptance letters", meaning?

MR BOULDING: The acceptance letters from the Buildings

Department.

CHAIRMAN: Thank you.

MR BOULDING: And the position under these letters, we say, is straightforward. None of these letters imposed any requirements for couplers, let alone any requirement for a QSP, a quality supervision plan. In this context, we say, as confirmed by paragraph 51 of Leighton's opening statement and paragraph 26 of government's opening statement, which perhaps I can be forgiven for reading -- the government says, in paragraph 26:

"According to the accepted drawings, no ductility couplers were used at NAT and no couplers were used at HHS. Thus, QSP does not apply to coupler installation works at NAT and HHS."

So, in those circumstances, we say we agree, no QSP applied to the Hung Hom Stabling Sidings.

What about the South Approach Tunnel? The acceptance letter here is dated 25 February 2013 and can be found at exhibit LPF-26. That's DD8/DD10905-10996. This is referred to in paragraph 13 of the third witness statement of Buildings Department's Mr Lok Pui Fai. That's DD7/DD10289.

Now, in paragraph 3 of appendix IX to the acceptance letter, which is entitled, "Mechanical couplers for steel reinforcing bars for ductility requirement" -- that's DD8/DD10936 and 10938 -- this required a QSP for

type II couplers for rebar with ductility requirements.

Appendix X of the acceptance letter, entitled, "Mechanical couplers for steel reinforcing bars without ductility requirements" -- that's DD8/10940-10942 -- did not require a QSP for type I couplers for rebars without ductility requirements. But, having regard to the terms of the letter I've just referred you to, MTR accepts that the QSP applied to the ductility requirements in the diaphragm walls, as shown in the accepted drawings.

So that's two of the structures. What about the third one, the North Approach Tunnel? Here, the acceptance letter dated 5 November 2014 applied to the contract 1112 side of the works. Once again, we go to Mr Lok Pui Fai's statement for that. That letter can be found in exhibit LPF-19, that's DD7/DD10327-10344, and that's referred to in paragraph 8, this time of the second witness statement of Mr Lok. That's DD7/DD10273.

Now, this letter only contained requirements for couplers without ductility requirements, and that's set out in appendix V, entitled, "Mechanical couplers for steel reinforcing bars without ductility requirements", at DD7/DD10339-10341. This did not, thus, require any QSP for the works.

Now, what about the contract 1111 side of the works? Here, the acceptance letter was dated 11 July 2013, and this letter only required a QSP for couplers with

ductility requirements, and this was set out in paragraph 3 of appendix XI, entitled, "Mechanical couplers for steel reinforcing bars for ductility requirements". The reference for that letter is GG230 and paragraph 3 that I just quoted in terms of its title is at GG256.

Now, importantly, as confirmed by paragraphs 38 to 43 of Leighton's written opening statement, and paragraph 26 of government's written opening statement, which I quote again:

"According to the accepted drawings, no ductility couplers were used at NAT and no couplers were used at HHS. Thus, QSP does not apply to coupler installation works at NAT and HHS."

Now, the situation is that Atkins did not specify any couplers with ductility requirements in the accepted design for the North Approach Tunnel, and as such no quality supervision applied to those works.

But, having said that, when the stitch joints were reconstructed, heightened supervision requirements were in fact applied in the light of the nature and extent of the defective workmanship identified by MTR. But that, I emphasise, should not be conflated with the position regarding the original works, which of course was governed strictly by the acceptance letters that I have just referred you to.

Moving on to another topic that I would like to say just a little about -- you have heard something about it already -- but it's MTR's material submission and sampling process. You will not be surprised to hear, and you have probably read about it already, that MTR implemented a contractual material submission and sampling process in order to control the quality of materials used in the SCL project. This process covered, amongst other things, the rebars and couplers which were used for the construction of the NAT, the SAT and the stabling sidings.

What did it involve? Well, in summary, it was as follows. Clause 15.3.1 of the General Specification for Civil Engineering Works required contractors to submit a materials submission form in respect of the types of rebars and the couplers that they proposed to use. For example, if you were to look at the materials submission forms for the couplers and rebars used in the North Approach Tunnel -- that's BB2/1214 to BB3/1659 -- you would see that.

What would happen then was that MTR would review the contractor's material submissions by reference to, amongst other things, the acceptance letter issued by the RDO and the BD, and in addition the Materials and Workmanship Specification for Civil Engineering Works.

Now, if MTR approved a material submission, what

happened next was that the contractor would place the orders with the approved suppliers, and when the rebars and couplers were delivered to site they would then be sampled and tested in accordance with two documents, the provisions of two documents: firstly, section X of the Materials and Workmanship Specification for Civil Engineering Works; and, secondly, the Construction Standard on Carbon Steel Bars for Reinforcement of Concrete. The reference there is BB2/1178-1213.

It's important to note that MTR's team of inspectors of works and work supervisors as well as Leighton's construction engineering team were involved in the material sampling process. As far as this testing and sampling is concerned, even though it has to be accepted that there are gaps in the RISC form records, the sample details were nevertheless recorded in what's referred to as steel test requests. These were submitted by Leighton on MTR's material testing system to MTR, and based on each steel test request Leighton would attach an orange tag, with a unique steel test request tie number, to each specimen. Then what happened next was that the inspectors of works would then verify and confirm the steel test request form on the material testing system, in order to enable Leighton to deliver the specimens to MTR's designated laboratory for testing.

Now, we've got evidence on this, and importantly the evidence of MTR's inspectorate staff, in particular Tony Tang -- that's BB1/137 -- and a Mr Tung Hiu Yeung -- BB8/5260 -- as well, I emphasise, as Leighton's construction team, is that so far as they are aware, firstly, the rebars used under contract 1112, including the three stitch joints and the shunt neck construction joint, were both acceptable and compliant. And, moreover, the results of all the steel bar tests entered into the material testing system were recorded as a "pass". That's BB2/543-1040.

Against that background, I'd like to say a little bit more about the issues which form the subject of this part of the reference, so I turn to issues 1 and 2, defective stitch joints and the shunt neck construction joint at the North Approach Tunnel.

First of all, I want to say a little bit about the investigation and remedying of the defective stitch joints in 2018. Here, it bears emphasis that as set out in section II of the report on defective works identified at the tunnel stitch joints -- now, that was dated 26 March 2018; it's located in the bundle at AA1/57, in particular at page 58 -- what happened was that MTR observed water seepage at the newly completed North South Line stitch joint during routine site surveillance.

Consequently, and after the leak was found, from October 2017 Leighton carried out cement and what's referred to as PU grouting works -- and I understand that that's a specialised grouting technique that involves the injection of expanding polyurethane to stop any water flowing down or through cracks, to fill voids under slabs, concrete joints, or behind concrete walls and joints.

Now, unfortunately, these grouting works did not effectively resolve the water seepage, and as a result, from 6 to 8 February 2018, MTR instructed Leighton to chip off the concrete at three locations, to expose the rebars at Mr Pennicott's joint 1 for further investigation.

This chipping off revealed that some of the rebars at the stitch joints were not properly spliced and, moreover, were only slotted into the couplers.

Then further investigations from 9 to 12 February at joints 2 and 3 revealed similar defects in the coupler splicing assemblies. Not surprisingly, you might think, as a result of these investigations, MTR issued three non-conformance reports to Leighton to record Leighton's defective workmanship, and these were as follows: NCR066 dated 22 December 2017 was issued in respect of joint 1, that was BB7/5087-5098; NCR095 dated 9 February 2018 was issued in respect of both joints 1 and joint 3, that's

BB7/5099-5111; and last but not least, NCR096, dated 14 March 2018, was issued in respect of joint 2, and that's BB7/5112-5115.

Now, Leightons carried out the necessary remedial works from March to July 2018, as to which these remedial works, you will not be surprised to hear, were governed by various method statements. These can be found at BB7/4717 through to 4737; CC3/1914 through to 1972; and, finally, BB7/4778-4843. They make rather turgid reading. I don't intend to take you there at the moment.

But what I can tell you is that where the existing couplers were damaged or could not be reused, post-drill rebars or couplers were installed, using what is referred to as Hilti 200 injectable mortar. But if the existing couplers could be reused, appropriate lapping rebars were screwed into the couplers.

And MTR, having found these defects, implemented a quality assurance and control system for the remedial works. The remedial works were subject firstly to hold-point inspections by MTR's inspectorate staff, and these inspections were recorded in both the RISC forms and record photographs. That's a matter spoken to by MTR's Mr Jacky Lee, see in particular paragraph 30 of his statement. That's BB102-103.

The finally updated versions of the QSP for the BOSA

type II couplers and the Lenton couplers were submitted by MTR to RDO by a letter dated 26 March 2018. That's BB7/4424-4459. And the quality assurance scheme was submitted to RDO by letter dated 27 July 2018. That's BB7/4460-4716.

Now, I emphasise that in accordance with the BOSA and the Lenton QSPs, firstly the technically competent persons -- a term you've heard before -- identified in the site supervision plans were also responsible for the quality control of the remedial works. Specifically, MTR was responsible for inspecting 20 per cent of the splicing assemblies, whereby Leightons were responsible for providing full-time and continuous supervision.

Now, whilst this was going on, previously, by a letter dated 22 March 2018, MTR had submitted the updated site supervision plans to RDO -- that's BB7/4844-4874 -- and they had also identified the relevant technically competent persons for the supervision and inspection of the remedial works.

It didn't stop there though, because these site supervision plans were further updated by MTR's letters dated 14 June 2018 -- that's BB7/4875-4899 -- and a letter dated 21 August 2018; that's BB7/4900-4916. And Leighton has duly signed and MTR has kept and countersigned both the BOSA and the Lenton coupler checklists -- they can be seen at BB7/4278 through to

4389 -- and, it bears emphasis, the BOSA and the Lenton thread preparation records; that's BB7/4917 through to 4956. That's to ensure compliance with the BOSA and the Lenton quality supervision plans.

On this basis, NCRs 066 and 096 and 095 were all closed out, the first two on 5 September 2018 and the last one, 095, on 28 June 2018.

Given the importance of the quality and structural safety of the remedial works to MTR, I point out that in the period 22 March to 1 June 2018, Mr Aidan Rooney, the general manager for the SCL project, who gave evidence before you last time, deployed an independent quality control team on site.

This team consisted of a senior construction engineer, a senior inspector of works, and two construction engineers. None of these engineers, none of these persons, had had any prior involvement with either contract 1111 or contract 1112. They wanted a clean slate.

Now, these people oversaw the remedial works for the defective stitch joints every day, and they witnessed the hold-point inspections for the rectification works which were recorded in RISC forms, including, for example, the remedial works to the top slab. And as a reference to that, I'd invite your attention in due course to paragraph 30 of MTR Jacky Lee's statement.

That's BB102-103. And as to the remedial works to the top slab, that's RISC form 12832, BB400.

My learned junior has pointed out that perhaps I ought to say that the RISC form 12832 responds specifically I think to Prof Hansford's point about a missing RISC form. In fact, that is the relevant RISC form for it. We could turn it up but I don't think there's any need to do that at the moment unless you would have me do so.

This inspectorate team worked very closely with the MTR inspectorate staff on site and they also provided daily reports containing observations and recommendations that Aidan Rooney considered and followed up on, where appropriate, in the light of actual site conditions.

What about submitting a report on all of this? Well, MTR submitted a report on the eighth design amendment for the NAT tunnel structures, NSL Tunnel, East West Line Tunnel, stitch joint remedial details, and it was referred to as "deliverable no. 3 13B" by a letter dated 15 February 2019 to the RDO. That's BB6/3678 through to 4214. And the purpose of this was to keep the RDO appraised of the nature and locations of the remedial works carried out by Leighton, but also to provide the RDO with the as-built records of the drill-in holes and the reused couplers.

I'm happy to say that the RDO's letter of 4 April 2019 -- that's BB6/4275 through to 4277 -- formally accepted the design amendments. The current position is that MTR has requested Leighton to provide all details, records and information relating to these defective stitch joints, and the purpose of this is twofold: so that it can, firstly, fully investigate the safety and quality of Leighton's works; and, secondly, the causes of the defective stitch joints to which Leighton responded.

Now, that was not the end of the matter, because in or around mid-February 2019, MTR's inspectors identified further water seepage at the stitch joints. This, as you might expect, was recorded in a snag list as well as in a number of RISC forms, which also contained photographic records; bundle reference BB7/4959 through to 5066. Unfortunately, thereafter, further water seepage was observed in the period March through to April 2019 and various grouting injection works were carried out with a view to rectifying the same.

As at 18 April 2019, just over a month ago, there was still one location with, I emphasise, minor water leakage. The current situation, to respond specifically to a point made by my learned friend Mr Pennicott in paragraph 73 of the Commission of Inquiry written opening, is that there are no other technical

investigations on this matter, apart from the two North Approach Tunnel reports. MTR is carrying out ongoing investigations and follow-up works in respect of water seepage at the stitch joints, and, as you would expect, will provide the Commission of Inquiry with further information as and when it becomes available.

So that's the stitch joints. What about the shunt neck? As set out in section III of a report entitled, "Shunt neck connection report at 1111/1112 interface of NAT structure contract 1112" dated 26 October 2018, at DD1/3864 through to 3865, what it says is, in summary: the shunt neck structure was completed in May 2017. During the site inspections for the energisation of the overhead line at or about the end of 2017, MTR observed minor cracks in the shunt neck structure. On 6 March 2018, MTR instructed Leighton to chip off the concrete at the three locations to expose the rebars at the shunt neck construction joint for investigation, and these investigations revealed that some of the rebars at the construction joint were, unfortunately, just like the stitch joints, not properly spliced and only slotted into the couplers.

Again, MTR raised a non-conformance report, in this case number 267, and issued that to Leighton on 30 October 2018. That's DD2/1103 through to 1105. And that non-conformance report remains open to this day,

pending Leighton's remedial works.

The current situation is that the resubmission of the remedial proposal was made to RDO on 29 April 2019, and RDO's acceptance or otherwise of that remedial proposal is still awaited.

I now, having identified the defect and the remedial work, would like to say just a little bit about MTR's position on the defective coupler splicing assemblies in the three stitch joints. I should say immediately that MTR does not accept that there are any design issues involved in respect of the three stitch joints, certainly so far as the defects are concerned, and you may well recall, sirs, that MTR's position on this, ie on no design issue, was set out in some detail in Mayer Brown's letter to the Commission of Inquiry, dated 3 May 2019, when it served its first-round witness statements. That's paragraph 6 of the letter, and the letter can be found in the bundle at BB1/62. Quite frankly, I have nothing further to say than what's set out in the letter.

Now, MTR contends that in the light of the existing evidence, effective coupler splicing assemblies at the three stitch joints, and indeed at the shunt neck construction joint, are attributable to the defective workmanship of Leighton and/or its sub-contractor, Wing & Kwong. We would say that if it be the case that the

defective coupler assemblies were due to any mismatch between the rebars used by Leighton and the Lenton couplers at the contracts 1111/1112 interfaces at the stitch joint and the shunt neck construction joint, it was incumbent on Leighton to address the issue.

Why do I say that? I say that for a number of reasons. Firstly, Leighton were well aware of the fact that Lenton couplers and not BOSA couplers were used, were going to be used, by GKJV at the contract 1111 side of the 1111/1112 interfaces; and, moreover, the fact that BOSA T40 rebars, which we have heard were not taper-threaded and in fact the exhibits have turned up, we've got the exhibits to show you later today if necessary, could not be screwed into the Lenton couplers.

What's the evidence here? Both Leighton's Mr Karl Speed and Mr Joe Tam accept that certain members of Leighton's construction and engineering team were aware of this, because it was specifically and extensively discussed at numerous contract 1111/1112 interface meetings between 2014 and 2017. That was a point that I think Mr Tsoi referred to yesterday.

In that regard, in due course, I'm sure we will go back to the minutes of these meetings, that's at BB3/1678 through to 1795, which record that the material related submission form for Lenton couplers was tabled

by GKJV, and Leighton said it would check with their supplier regarding compatibility at a later stage.

It was discovered in July 2017 that perhaps, not surprisingly, the parallel threaded BOSA T40 rebars could not be fully screwed into the Lenton couplers which required tapered threads. But, according to Wing & Kwong's evidence -- and we heard some of this yesterday -- Leightons instructed Wing & Kwong to carry on with the parallel threaded rebars, as there was not enough time to rethread the rebar. I think we saw both of these letters yesterday but a couple of Wing & Kwong letters which are to that effect can be found at CC3/1358 and CC3/1363.

What ought to have happened, we say, is that any incompatibility issues between the rebars procured by Leightons and the couplers exposed at the stitch joint interfaces -- first of all, the matter ought to have been raised with MTR promptly, and then resolved, resolved at the time, for example by Leightons ordering the correct Lenton threaded rebars for the contract 1111/1112 interfaces. But, in the event, Leighton gave no such complaint or notification, at the time when the stitch joints were constructed.

Now, defective coupler splicing assemblies were also identified at the contract 1112/1112 North Line stitch joint, that's Mr Pennicott's joint 2; and the

contract 1112 side of the contracts 1111/1112 interfaces, that's Mr Pennicott's joints 1 and 3. But there was no issue of mismatch given that only BOSA couplers and rebars were adopted on contract 1112. So we would say, again, that this problem was obviously attributable to Leighton's defective workmanship.

Now, the necessary remedial works have already been carried out in respect of the defective coupler assemblies in the stitch joints, and on the current evidence there are no concerns with the overall structural safety or indeed the integrity of NAT, SAT or the Hung Hom Stabling Sidings. I also point out in this regard that they show no signs of discretion, and there's no signs of distress in other structures either.

That's confirmed by Pypun's recent site inspections.

I now come to quite an important matter, and that is what was MTR's involvement in the construction of the stitch joints and the shunt neck construction joint? Here -- and we will hear about this in due course, so I'm not going to spend too long on it -- MTR's relevant evidence is to the effect that, firstly, MTR's Tony Tang, he would inspect the rebar fixing works at the three stitch joints and the shunt neck construction joint activities in the course of his day-to-day site surveillance activities. He had also carried out the pre-pour checks. His statement is at BB/129-130. It's

essentially paragraphs 33 to 36.

Not surprisingly, you might think, he says that he would raise objections with Leightons if couplers were not properly installed, but in fact none were identified at the time.

You will also hear from a Mr Chris Chan in due course. His statement, the relevant part thereof, are paragraphs 22 to 25. That's BB116-117. He tells the Commission of Inquiry that his regular site surveillance also covered the three stitch joints and the shunt neck construction joint, but he was never asked by anyone at Leighton to conduct formal inspections of such areas.

As I've said, we will hear from those witnesses in due course, and no doubt their evidence will be tested as appropriate.

I now want to move on to issue 3(a), and essentially there are two elements in issue 3, and the first I describe as 3(a), and that's the alleged lack of inspection and supervisory records.

First of all, MTR accepts that there are gaps in the RISC form records in respect of the hold-point inspections carried out at NAT, other than in the North Fan Area where the RISC forms are generally in order. There are also gaps at SAT and also at the Hung Hom Stabling Sidings.

So what's the current situation? MTR has conducted

a number of searches to identify the RISC forms which appear to be missing. At the moment, there are 138 outstanding NCRs in relation to the missing RISC forms for these three structures. As you can imagine, the position is constantly being reviewed.

Of these NCRs, numbers 204 through to 217, and 246 through to 247 specifically related to missing RISC forms for the three stitch joints, although it's expected that these NCRs will be closed out upon the completion of all the remedial works.

In this context, what does the evidence tell us? The evidence at the moment tells us that the gaps in the RISC forms were occasioned by Leighton's omissions during the construction works, and this unfortunately was the case despite MTR's repeated complaints to Leighton, through its construction management team, in the period 2014 to 2017. You will read evidence about that in due course.

As I touched upon already, and you have heard from one or two of my learned friends, the reality of the situation is that Leighton's paperwork was persistently behind the actual progress of the works, and that meant that RISC forms, if served at all, were very late. We've heard that this was due to a lack of resources, and where the RISC forms were only received after the relevant hold-point inspections, the MTR construction

engineers and inspectors of works tell you that they often marked the RISC forms as late submissions -- if you look at them, you can see that written on some of them -- and indeed record the date and time of the inspections by reference to record photos they had taken.

But it didn't stop there because, in addition, the MTR inspectors of works created WhatsApp groups, and these WhatsApp groups served to illustrate and record the issues with the RISC forms, including the modus operandi of the hold-point inspection process.

What happened in the field? Well, the reality was that MTR say that had it insisted on receiving all of the RISC forms before the works were allowed to proceed, there would have been significant and unacceptable delays to all of the works. So what should they do? Well, MTR's construction engineers and inspectors of works tell you that they adopted a collaborative approach and acceded to Leighton's verbal requests for hold-point inspections. But having adopted that approach, they relied, in good faith, on Leighton's assurance that the requisite paperwork had been submitted or would be made good subsequently, which unfortunately often turned out not to be the case.

But did this lack of a RISC form mean no inspection? Fortunately, that question is answered in the negative.

That's answered in the negative because MTR's evidence is that their construction engineers and inspectors of works carried out the necessary hold-point inspections and gave permission to Leightons before the work proceeded to the next stage; and, moreover, specifically, pre-pour checks were only carried out after the rebar fixing inspections had been carried out, and they say it would have been very difficult, if not impossible, for any of the works to proceed beyond the rebar fixing and the pre-pour check hold points without any prior permission from MTR being sought and obtained.

And MTR, in this regard, they are not a voice in the wilderness, because MTR's evidence is entirely consistent with the evidence of Leighton and indeed Wing & Kwong's sub-sub-contractor, Loyal Ease Engineering Ltd, and of course they are not the only records, because contemporaneous records of the construction works and the inspection works carried out by MTR were kept in the form of daily photographs by the inspector of works.

Sir, I see the time. I've got a little bit more to do. That would be a convenient moment because I'm moving on to a slightly different topic, if that's convenient for you.

CHAIRMAN: That sounds excellent. Thank you very much indeed.

MR BOULDING: Thank you very much.

CHAIRMAN: So you will be, it looks like, about quarter of an hour or so, 20 minutes maybe?

MR BOULDING: Yes.

CHAIRMAN: Mr Clayton, then you will follow.

MR CLAYTON: I think I will be about ten minutes, subject to any questions from the tribunal.

CHAIRMAN: Good. Thank you.

Then, Mr Pennicott?

MR PENNICOTT: We've got Mr Pun from Fang Sheung standing by to give evidence later this afternoon.

CHAIRMAN: Good. Thank you very much indeed.

What time should we start? I'm happy to start that little bit earlier.

MR PENNICOTT: I think, given the indication that both Mr Boulding and Mr Clayton have given, we are okay to start at 2.30.

CHAIRMAN: Good. 2.30.

(1.03 pm)

(The luncheon adjournment)

(2.32 pm)

MR BOULDING: Good afternoon, sir. Good afternoon, Professor. There are just two or three further matters I would like to address you on. Before the luncheon adjournment I was telling you that notwithstanding the absence of RISC forms, the necessary inspections still

took place.

In this respect, I anticipate the evidence of Dr Peter Ewen, MTR's engineering director, who is coming along to give evidence in due course. He tells you, and will explain in further detail when he takes the witness stand, that the well-known consultancy firm of WSP has been engaged as an independent audit consultant to verify that the works in the NAT, the SAT and the HHS were indeed properly inspected in terms of hold points, even though there's an absence of full RISC forms.

In terms of what it involved, the audit was as follows. It involved WSP reviewing the RISC forms provided by MTR for any inconsistencies or irregularities. But even where there were no RISC forms available for audit, WSP carried out various further investigations with a view to establishing whether or not the necessary inspections had been made, and this involved evaluating supplementary documentation such as photographs and site diaries, to determine whether or not there was sufficient evidence of hold-point inspections having taken place.

Against that background and utilising that information, they adopted a colour coding to record the results of their audit: red, no supporting materials; yellow, insufficient supporting materials; green, sufficient supporting materials to confirm that the

necessary inspections had in fact been made. This resulted in WSP preparing a report for both the NAT and the SAT. They were both dated 15 May. The NAT report is at BB11/7625 through to 7646, and that for SAT is at BB13/9199 through to 9218.

Consistent, I emphasise, with MTR's factual evidence, and of course the evidence from Leighton, WSP's reports demonstrate that it has assigned green audit results for most -- I emphasise "most" -- of the essential hold-point inspections on key structural elements of the North Approach Tunnel and for all of the essential hold-point inspections for the South Approach Tunnel.

At the moment, not least because of its size, the report for the Hung Hom Stabling Sidings is still being prepared, but obviously it will be furnished to you and of course the other interested parties as soon as it is available.

You heard last time that MTR are always seeking to improve themselves, and you will probably recall that it was common ground between the project management experts last time that there is no project management system that could avoid any and all mistakes during the construction process. I don't want to sound like a cracked record but notwithstanding that fact, MTR is constantly seeking to develop and improve its project

management system. The recommendations canvassed by Turner & Townsend and Mr Steve Huyghe and your own Mr Steve Rowsell, which you heard so much about last time, are continuously being implemented by MTR's cross-disciplinary special taskforce; again, a matter to which Dr Peter Ewen speaks.

An interim health check by Turner & Townsend is scheduled for about now, and in addition I can tell you that the following measures are either in place or to be put in place with a view to addressing the project management issues which are relevant to this extended Commission of Inquiry, and MTR and its advisers are confident that they will satisfactorily address any failings.

So what are they? First of all, there's the digitalisation of the site inspection process and the adoption of a building information modelling scheme, otherwise known as BIM. That's going to be introduced and it's being overseen by the project digitalisation taskforce. It involves the introduction of various measures, firstly iComm -- this, I'm told, is an instant messaging tool; iSuper, that's an intelligent supervision tool for the digitalisation of, amongst other things, the RISC form process, non-conformance reports and site diaries; and, last but not least, something called iRISC -- this is underpinned by iSuper

and keeps track of the number of RISC forms that have to be submitted.

What's the effect of all this? It's confidently predicted that these measures will enable the frontline staff to complete the record-keeping process digitally and reduce the risk of records being missed.

In addition, there is going to be better training. MTR's frontline staff are receiving enhanced training for better PIMS implementation, and all of this is going to be overseen by MTR's newly established project division quality working group. This training, overseen by this group, has involved all of MTR's frontline project staff attending a PIMS training module between the end of 2018 and the first quarter of 2019. But it doesn't stop there because that's been followed by more specific job training.

You heard about the three lines of defence policy last time. I'm not going to go into that in detail, but I can tell you that that's been re-formulated and enhanced, and it's going to be introduced, rolled out, through 2019.

Last but not least, a PIMS review panel has been established, and in or around the second half of 2019, about June, I'm told, an external consultant will be appointed to oversee the complete overhaul of the PIMS in line with Turner & Townsend's recommendations. You

will hear, as I've said, more about that from Dr Peter Ewen in due course.

I told you that there were two parts to issue 3. I've dealt with the first part, that was RISC forms. The second point is the alleged deviation to the change or the change from lapped bars to coupler connections at the construction joints, and that was in the North Approach Tunnel, the South Approach Tunnel, and the Hung Hom Stabling Sidings.

Now, what happened here, according to the evidence of both Leighton and indeed MTR, is that during the construction of these elements of the structure, and to firstly suit site conditions, and secondly accommodate the coordination and programme sequence of the works, coupler connections were introduced instead of lapped bars at a number of slab-to-slab wall construction joints.

How and why did this occur? The relevant evidence comes in particular from Mr Kit Chan -- you have heard from him before -- MTR's former construction manager, and he says that at the design stage of the works, and in accordance with convention and common practice within the construction industry, no consideration was given to coordination, programming or sequencing issues, for either the North Approach Tunnel, South Approach Tunnel or the stabling sidings. He tells us that such

coordination, programming and sequencing would typically arise for consideration during the construction phase of the works, when the structure is being progressively built and the work areas become increasingly congested.

Why is that? He says it's at this stage that the clashes and other coordination sequencing issues which arise on a site -- it's at that stage that they arise, and not only do they arise but they have to be resolved, and they have to be resolved to take account of or suit site conditions.

Certainly one reason for the change to coupler connections was, as you have possibly read, to form an opening and a permanent structure for the provision of a temporary site access for a short period of time.

This could not have been achieved if the structure was built with lapped bars and concreted all at the same time. I'm told, and Mr Kit Chan tells you, that this is a very common practice in construction and engineering projects like the SCL project, and not only does he tell you that but I repeat it because it's important, this reason for the change and the way in fact the change was implemented on site is entirely consistent with the evidence of both Leighton and its sub-sub-contractor, Loyal Ease Engineering Ltd.

Now, in the context of this change -- and I'm sure you will remember this -- you have received expert

evidence from Prof Don McQuillan. See, for example, paragraph 53 of his expert report. That's ER1/3/28. His evidence was given in the context of the change which was under consideration in part 1 of the Commission of Inquiry. That of course related to the change in connection details in the east diaphragm wall of the East West Line slab. I'm sure you will recall that he confirmed that couplers or welding can indeed be used in lieu of lapped rebars and vice versa; and, moreover, that such a use was contemplated by paragraph 8.7.1 of the Code of Practice for Structural Use of Concrete, 2004, second edition. That's H8/2946.

MTR contends that this is equally applicable to the change from lapped rebars to couplers in the NAT, the SAT and the HHSS; and, moreover, we point out that such fact is expressly acknowledged in government's evidence. In this regard, we have in mind paragraph 40 of the second witness statement of Mr Lok Pui Fai. In summary, he says, and to quote:

"Couplers is an alternative splicing method as stipulated ..."

And then he refers to the 2004 Code of Practice that I just identified for you.

This is where appendix 7 to the project management plan is relevant. It is, I think, the only document that I'm going to flash up on the screen, just to show

you what I'm talking about. Appendix 7 of the PMP dated June 2016, which was submitted to the Buildings Department and the Railway Development Office on 20 June 2016, can be found at B4/2475.

Let's just see what it says at the top: "Flow chart for design management and assurance procedure". Then if we scroll down, please, and we can see it's a flow chart. What the evidence is going to tell you in due course, Commissioners, is that this change falls within the rhombus entitled, "Amendments necessary to suit site condition?" Not only that, but it's a minor change, and MTR and indeed Leighton contend it need not be the subject of design and consultation submissions; unless it be the case, and this is clear from the flow chart, that the amendment does not conform to MTR's design standards, manuals or specifications, and we say that they do.

COMMISSIONER HANSFORD: Sorry, Mr Boulding, is that the "Yes" and "No" on this diagram?

MR BOULDING: Yes, absolutely rights.

COMMISSIONER HANSFORD: So what does "Yes" mean?

MR BOULDING: If amendments are necessary to suit site conditions, you then -- if the answer to that is "Yes", which we would say it is, you then get shunted back to "Conform to DSM/specification?", and we would say that they do. So then you go down through the lines again

and you go straight through the "Amendments necessary to suit site condition?", because obviously there are no further amendments required. "Construction in accordance with working drawings?" -- we certainly say they are not in contravention of the working drawings, and in those circumstances the only obligation is to record the change in the as-built records, as to which we will have more evidence later.

That's really anticipated, that question -- thank you very much indeed -- where I was going next, but I will say that the change had no structural ramifications and, as such, did not have to be recorded as deviations or non-conformances in any non-conformance report, and nor, we would submit, in a RISC form, certainly so long as the couplers used were properly tested and there was no change to the rebar diameter or spacing, which in fact was the case.

What government say here is that, "No, no, no, no, appendix 9 of the project management plan applies", as to which we say, with the greatest of respect, that that is misconceived. But we will elaborate upon that in due course in the evidence, and again I suspect in closing submissions. But so far as the current position is concerned, MTR has made a number of requests to Leighton to provide the details and locations of the change from lapped rebars to coupler connections, and Leighton is in

the course of preparing the as-constructed drawings.

We confirm that the as-constructed conditions of NAT, SAT and HHSS will all fall under the verification proposal of which we have heard so much over the course of the last few weeks and even during the last day or so in this hearing.

Paragraph 5.1 of that verification proposal describes the proposed approach which is as follows. It can be found at AA/146 through to 147. Part 1a provides for the consolidation and verification of all available construction records to identify the gaps in the records. Part b refers to the formulation and implementation of a proposal for reviewing and ascertaining as-constructed conditions. And part 2 provides for a structural review to be conducted and for schematic remedial works and a monitoring scheme to be devised as and where necessary.

As always, sir, we undertake to provide you with further relevant information as soon as it becomes available.

That's all I wanted to say to you at the moment, sir. I hope you found it helpful. If I can answer any questions, I will endeavour to do so, and of course I'm in the process of taking instructions as to Mr Chow's update that he gave this morning and we will revert as soon as possible.

Thank you very much.

COMMISSIONER HANSFORD: Mr Boulding, I have one question. In your paragraph 49, on page 17 of your written submission, which you didn't take us to, I don't think --

MR BOULDING: No, I haven't really taken you to any of the written opening.

COMMISSIONER HANSFORD: Some of it you have, actually. But in paragraph 49 on page 17, where you acknowledge there are gaps in the RISC form records, but you say:

"This is an administrative/procedural issue, given that RISC forms do not constitute a statutory or regulatory requirement."

MR BOULDING: Correct.

COMMISSIONER HANSFORD: But they do, of course, constitute part of the quality assurance records, and are you saying, as such, they are an administrative/procedural issue? Are you saying quality assurance records are an administrative/procedural issue?

MR BOULDING: In effect, yes, sir, and you will see that the witness statements of government are their reference 144, and that statement, certainly as we understand their evidence, is consistent with the evidence of Mr Lok Pui Fai, and he makes two statements to that effect. So there we are.

COMMISSIONER HANSFORD: But they are of course part of the

quality assurance?

MR BOULDING: That's right.

COMMISSIONER HANSFORD: Thank you.

MR BOULDING: Thank you very much, sir.

CHAIRMAN: Good. Thank you, Mr Boulding.

Yes, Mr Clayton.

Opening submissions by MR CLAYTON

MR CLAYTON: I'm most obliged. It now falls for me, the last man on the block, to make the opening. May it please the commission, I, along with those instructing me, MinterEllison, appear for Pypun, the government's consultant.

I don't intend to repeat the written opening in oral opening. I would just like to highlight a few matters and obviously answer any matters the Commission might wish to raise with me.

Pypun's function was to assist the Highways Department in accordance with the M&V agreement with regard to the construction, testing and commissioning phase of the project. A consideration of Pypun's involvement in respect of the issues raised, it is respectfully submitted, can only be made in the context of its obligations under the M&V agreement.

And paragraphs 5 to 12 of Pypun's opening, I believe, set out Pypun's role by reference to the provisions from that agreement. These paragraphs also

address one aspect of Pypun's work, site visits and audits, by reference to the relevant entrustment agreement within which Pypun, being the government's consultant, will be operating, as well as by reference to the M&V agreement. Again, Pypun's performance can only, it is respectfully submitted, be considered in the light of those provisions.

Obviously -- and this is borne out by the witness statements, both Pypun's and the governments -- Pypun's role assisting the Highways Department was performed in the light of ongoing and frequent discussions at meetings and elsewhere and email and other exchanges between Pypun, Highways Department and the representatives of the Buildings Department who had been seconded to the Highways Department. This would inevitably be a two-way process, with suggestions and input coming from Pypun, the Highways Department, and no doubt the seconded Buildings Department representatives.

Paragraphs 13 to 16 of Pypun's opening deal with the scale of the SCL project. It is, on any view, extensive. Pypun's involvement was across the whole project, and the Commission is here considering matters arising in respect of one contract.

Mention has been made of Pypun's obligation to act proactively, and I would like to consider that just briefly in oral opening. Being proactive or not would

have to be considered in context, ie in relation to a particular activity or set of activities. There were many different aspects of Pypun's involvement, and different considerations would likely apply in this regard to these different activities.

Further, it might have, but I'm not suggesting it did happen, Pypun might, on a particular aspect or issue, have put forward proposals that were not then taken up by the Highways Department or the Buildings Department representative on its behalf. Were one considering the question of Pypun being proactive on a particular matter, that would need to be investigated. The point I am trying to make, probably not very well, is that in my respectful submission an investigation would need to be made in the evidence in the context of a particular activity before a view could be formed in relation to Pypun's involvement or indeed I could really address the point in relation to it being proactive.

Then I move from that to one other point I would like to make. I'd like briefly to look at one other matter in opening, the RISC forms, forming part of MTRCL's quality control documents. Under the M&V agreement, Pypun did not have a quality-checking role. RISC forms were under the MTRCL's scheme of supervision to arise for three matters: inspections, testing and survey checks. The relevant sample form from the PIMS

is identified at paragraph 21(2) of Pypun's opening, showing those three matters.

Mr Yueng from Pypun, at paragraphs 64 to 66 of his second witness statement -- and that's GG1, pages 38 to 39 -- deals with the difference, as he understands it, between the M&V consultant's role for government under the separate MTRCL project, the XRL project, and under this SCL project.

There was a quality monitoring role under the XRL project for the M&V consultant. That's his evidence. As part of its obligations under its agreement, Mr Yueng also mentions that on the XRL project, he understands a separate team was set up by the M&V consultant there, because of this obligation to monitor quality. Pypun, as additional work, has now undertaken two exercises, in June, July and September 2018, with a final report in December 2018, and there is then the latest report produced a few days ago in relation to the RISC forms. Those are at GG2, pages 442 to 883, and in GG3, in the bundles.

In those exercises, it's been looking at the RISC forms in relation to some inspections for which they should have been produced only, and under only one contract. One can see how long that took and the products of those exercises.

It seems to me, and I make this submission,

inevitable, in the light of what we can see was involved in those exercises, that a quality check, even for RISC forms alone, would require a separate full-time consultant team, to audit the RISC forms alone for the relevant contracts in the SCL project. This was not envisaged by or allowed for, in my respectful submission, in the M&V agreement at all, and indeed, until this problem arose and was identified in 2018, nobody suggested that Pypun should have been looking at RISC forms at all.

Now, those are the only points I wish to make in opening. Unless the Commission has some questions of me, that's my opening.

CHAIRMAN: Thank you very much indeed, Mr Clayton.

MR CLAYTON: I'm most obliged.

MR PENNICOTT: Thank you. Sir, can I thank all my learned friends for their openings. With that, we now move to the evidence.

Sir, as you are aware, Fang Sheung, although not an involved party, have played a part in the issues, or at least some of the issues, with which the Extended Inquiry is concerned. They do not have their own legal representation, for primarily financial reasons, as they have explained to the Commission.

In those circumstances, the Commission's legal team felt it appropriate to approach Fang Sheung to obtain

a witness statement or witness statements from relevant personnel.

The upshot is that we just have one witness statement from Mr Pun, the sole proprietor of Fang Sheung, and in order not to inconvenience him, as it were, we have taken the view that we should call him first, now. I anticipate he will not be that long, and I would respectfully suggest we just get on with it now, if that is all right with everybody else.

CHAIRMAN: Certainly. We have only been sitting for half an hour.

MR PENNICOTT: Quite. So somebody, I hope, will fetch Mr Pun.

He will be giving his evidence in Cantonese, so I think we need the headphones, or at least those of us who don't speak Cantonese.

MR PUN WAI SHAN (affirmed in Cantonese)

Examination by MR PENNICOTT

MR PENNICOTT: Mr Pun, please sit down.

Mr Pun, thank you very much for coming along to give evidence to the Commission this afternoon. I'm sorry if we have been holding you up for most of today.

Mr Pun, you have helpfully prepared for us a witness statement, which is in bundle FF at page 9, in the Chinese version, and FF13 in the English version.

Do you have the Chinese version in front of you,

Mr Pun?

A. I do.

Q. Can you confirm that that is the witness statement that you have recently prepared for the Commission?

A. 係。

Q. If you could go, please, to page FF12, is the signature that we see there yours?

A. 係。

Q. Mr Pun, do you confirm that this is the evidence contained in this statement that you wish to give to the Commission?

A. 係。

Q. Mr Pun, I understand that there may be one error, slight error, in the witness statement, at paragraph 6.

I think it's just a question of dates.

Could you look at paragraph 6, please?

A. 係。

Q. You say there:

"Fang Sheung staff worked at the site for approximately 10 months (excluding the minor piecemeal works at the beginning and at the end) from about mid-2015 to early 2016."

Did you want to change those dates, Mr Pun?

A. 應該係2017年嘅年頭嘅。

Q. Right, so ...

A. 就--係。

Q. ... mid-2015 to early 2017?

A. 係呀。

Q. Now, as you have told us before and indeed repeated in this statement, Mr Pun, you are the sole proprietor of Fang Sheung Construction Company?

A. 係。

Q. And, so far as this part of the Inquiry is concerned, Fang Sheung was originally engaged by Leighton to do the rebar fixing work in the NAT, that's the North Approach Tunnels, but Leighton switched it around so that you ended up doing the rebar fixing in the South Approach Tunnels; is that correct?

A. 正確。

Q. The reason you give for that, Mr Pun, in your statement is that it was "due to the constraint posed by the location of rebar yard". I'm reading from paragraph 3.

Could you just explain to us a bit more what you mean by "the constraint posed by the location of rebar yard", why that was the reason for the switch?

A. 因為我哋個南--嗰個yard喺南面嘅，咁我哋如果通過嗰個紅磡體育館下面去運去北面，係相當困難，當時係全部都根本冇到--冇路行㗎嘞，所以就係大家稍稍調一調。

Q. Okay. Understood. So it was essentially a matter of convenience and it made sense?

A. 係。

Q. Mr Pun, previously you told the Commission that you had had little involvement with the platform slab work, and I think we all recall that you left that work largely in the hands of Mr Joe Cheung. Do you remember all of that?

A. 係。

Q. But you tell us that so far as the SAT is concerned, you were much more hands-on; is that right?

A. 係呀。

Q. Indeed, you say, in paragraph 5 of your statement, that you were personally responsible for supervising the Fang Sheung workers in the SAT area; is that right?

A. 係呀。

Q. And indeed, further, you attended, you tell us, bi-weekly meetings with Leighton and other sub-contractors. As I understand it, that is specifically in relation to the SAT area; is that right, Mr Pun?

A. 嗰啲係進度係關於南隧道嘅，冇錯。

Q. Could I ask you, please, to look at paragraph 8 of your witness statement. You say there:

"During the process of rebar fixing, after Fang Sheung has completed fixing one layer of rebar, MTR and Leighton would have to inspect this layer of rebar

and confirm that the work quality of such layer of rebar is up to standard."

Do you see that?

A. 係，睇到。

Q. I don't know whether you will recall but in the first part of the Inquiry, we made a distinction between what was described as one layer of rebar and a mat of rebar which comprised a number of different layers. Do you recall that?

A. 係吖。

Q. Now, when you say here, in this sentence, "fixing one layer of rebar", are you referring literally to one layer, or are you referring to a mat of rebar which may comprise a number of different individual, single layers?

A. 南隧道啲鋼筋稍為少啲咁多嘅，咁我哋所謂嘅一層就係底層嘅鋼筋，底層嘅鋼筋。因為以前EW check嗰啲鋼筋係好多--底都好多浸，咁南隧道呢面係得T1同埋T--唔係，B1同埋B2，大概都係咁上下㗎，係少好多嘅。所以我哋就係紮到B1同埋B2之後，就地鐵即係監管嗰啲就會上嚟睇。

Q. Right. So the inspection would take place after you had done B1 and B2, then the inspection would take place; is that right?

A. 係呀。

Q. You go on to tell us, in paragraph 8 of your witness statement, that when those inspections took place by MTR

and Leighton, either you personally or one of your colleagues would be in attendance at that inspection. Is that correct?

A. 通常我哋都在場嘅，佢哋驗收嗰陣時。

Q. Right. Would they invite you, would they request you, would they instruct you to be present when the inspection took place?

A. 我哋應該在場嘅。係，佢哋通常都係邀請我哋又係好--總言之我哋係一定要喺在場喇，佢哋睇鐵就。

Q. All right. They requested you to be there?

A. 其實呢啲係我哋嘅責任嚟嘅，咁唔使佢邀請，我哋都要去嘅。

Q. Right. The reason that you were there was what? What was the logic of you being present at these inspections?

A. 佢嘅檢查可能發現到我哋會有啲錯處嘅，咁要即時--我哋要即時知道之後，馬上跟進嘅，如果我哋紮唔得啱嘅話。因為佢哋係工程師，或者係唔合乎地鐵嘅要求，咁都要即刻去改進咁樣。

Q. Right. Mr Pun, when the MTR and Leighton were doing the inspection, if there were couplers involved, would they be inspecting both the couplers and the rebar?

A. 一定嘅。

Q. Do you have any recollection, from your attendance at a typical inspection, as to how long that inspection might take?

A. 睇下嗰個實際情況，睇下複唔複雜。如果係相對簡單啲嘅，或者會好快脆，數下嗰啲鐵，或者睇下coupler呢個啱唔啱，有冇擺錯鐵咁，咁就會完成初步嘅

步驟㗎嘞。

Q. All right. Would, typically, the MTR inspectors or Leighton inspectors have with them any documents, any drawings?

A. 揸住則，揸住啲則睇，一定要嘅，揸住啲則去睇鐵，唔係你對唔到佢哋錯定啱㗎嘛嘛，做唔做得啱㗎嘛嘛，一定要有則嘅。

Q. Right. So let me just press you a little bit further. I appreciate your point that how long it takes rather depends on the exact circumstances, but are we talking somewhere between 15 minutes and an hour, or what are we talking about?

A. 通常都--通常最少都一個鐘、半個鐘㗎嘞，最少㗎嘞，冇話十幾鐘咁就走㗎。

Q. That's the minimum, half an hour minimum?

A. 最少㗎嘞。

Q. All right.

In paragraph 14 of your witness statement, Mr Pun, you describe the process by which the batches of rebar, or rebar within the batches, came to be tested. Do you see that?

A. 係。

Q. You say that:

"Leighton would notify Fang Sheung whether the test results of the ... samples were satisfactory. If the samples from a batch of rebars could not pass quality testing, the whole batch of rebars could not be used and

had to be scrapped."

Mr Pun, did it happen very often that the batches would fail the testing procedure?

A. 相反係好少，好少嘅。

Q. Did it happen at all?

A. 我記得就好似我哋落order嘅鐵就好似係冇，除咗係嗰啲鐵太鏽，即係話所謂表面上太生鏽，禮頓reject佢返轉頭，嗰啲就係唔屬於未驗，即係表面上睇嗰啲鐵已經係好鏽嘅，咁唔可以用嘅嗰啲就，一定係彈番轉頭嗰啲就。驗嘅呢，我記憶所及係絕少，絕少，絕少，究竟有冇？就唔係多記得嘞，但係係好少，好少，好少。

Q. All right. Then finally from me, Mr Pun, in the last section of your witness statement -- sorry, the penultimate section of your witness statement, starting at paragraph 16, you refer to the rectification work at the NAT stitch joint; do you see that?

A. 睇到。

Q. And you say that you did not personally have any direct involvement in that work; is that correct?

A. 冇錯。

Q. But what happened, as I understand it, is that you, Fang Sheung, were asked by Leighton to do the remedial work to the stitch joints, and you put Joe Cheung in charge of that; is that correct?

A. 佢都係喺咁嘅角色裏面，喺呢個補救工程裏面，都係得一個熟練嘅工人，去帶住啲工人去做㗎咋。

Q. Yes. Mr Pun, is it your understanding that when you were asked to do that remedial work, the demolition work which you refer to in your witness statement had already been done and completed by others?

A. 係呀，冇錯，乾乾淨淨㗎嘞。

MR PENNICOTT: It was clean. Thank you very much.

Sir, I have no further questions. I don't know whether anybody else has.

CHAIRMAN: Perhaps we can take it --

MR PENNICOTT: It's up to you which order.

CHAIRMAN: We will go from closest to you.

Mr Shieh?

MR SHIEH: No questions from us.

MS LAU: No questions.

MR CHOW: One or two questions for Mr Pun.

CHAIRMAN: Yes.

Cross-examination by MR CHOW

MR CHOW: Mr Pun, I appreciate that you mentioned you were more involved in the steel fixing work in the SAT than the platform slab, but we now know that in SAT, we do have similar couplers connection to be done between the slab and the diaphragm wall. Do you recall that?

A. 係，係。

Q. My question is this. From your recollection, insofar as the level of supervision from Leighton's site staff on your coupler connection work, for your work in SAT, is

it similar to the level of supervision provided by Leighton in the platform slab?

A. 應該係差唔多嘅。

MR CHOW: Thank you very much.

Sir, I have no more questions.

CHAIRMAN: Mr Boulding?

MR BOULDING: No questions, sir. No, thank you.

MR CLAYTON: No questions from me, sir.

CHAIRMAN: Thank you.

Anything?

COMMISSIONER HANSFORD: No.

MR PENNICOTT: Sir, I was right.

CHAIRMAN: Yes.

MR PENNICOTT: Mr Pun, unless -- you have no further questions?

CHAIRMAN: No, no further questions.

Mr Pun, thank you very much for your attendance today. It seems your evidence is completed. Our apologies if we kept you waiting.

WITNESS: 唔緊要。

(The witness was released)

MR PENNICOTT: Sir, I think that completes the substantive business for today.

However, can I just say this, because I'm not quite sure whether it's gone fully public in the sense that the next timetable has been produced. We've had to have

a bit of a rethink on the timetable and the order of the next three to four witnesses. Can I just tell everybody what is going to happen? I have had a brief word with Ms Lau who this directly affects.

Sir, we take the view that one of the Leighton witnesses, that is Mr Henry Lai, who is unable to give evidence during the course of next week, although he has kindly indicated that he is available on Saturday, of which more in a moment, he must give his evidence this week. That is the view that I have taken.

As a consequence of that, what is proposed is that Mr Ng Man Chun, or known as Ah Chun, that is the site supervisor from Loyal Ease Engineering, the sub-sub-contractors of Wing & Kwong, will give evidence first, and he will give that starting tomorrow morning at 10 o'clock.

He will be followed by Mr Leung, one of his co-workers from Loyal Ease.

We are hopeful that the evidence of those two witnesses can be completed during the course of Wednesday and Thursday, and we expect Mr Ng to be much longer than Mr Leung, at which point we will switch to Mr Henry Lai of Leighton, and the remaining Wing & Kwong witness, Mr Ben Cheung, will come after Mr Henry Lai.

So, as I say, we do think it very important that the evidence of Mr Leung, Mr Ng and Mr Henry Lai, as best as

possible, be kept together in one reasonable package of time. So that's the logic of that.

Just a word of warning that Mr Lai is not available beyond Saturday, and if we don't finish him on Friday we are going to be sitting Saturday. That, I'm afraid, is that.

CHAIRMAN: There is no echo of a warning there.

Thank you very much. That finishes the business for today?

MR PENNICOTT: It does, sir. Thank you very much.

CHAIRMAN: And tomorrow morning at 10 am, is that the time we will have the witnesses?

MR PENNICOTT: Yes.

CHAIRMAN: Thank you all very much. Until 10 am tomorrow.

(3.27 pm)

(The hearing adjourned until 10.00 am the following day)

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