

**Commission of Inquiry into the Construction Works
At and Near the Hung Hom Station Extension
Under the Shatin to Central Link Project**

**MTRCL's Closing Submissions on Further Expert Evidence
(for the Extended Inquiry)**

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I. Structural Safety

1. On 15 May 2019, MTRCL formally submitted a Verification Proposal¹ to RDO. The Verification Proposal was accepted by the Government by RDO's letter to MTRCL dated 15 May 2019².
2. The Verification Proposal consists of two main parts:-
 - (1) Part 1:
 - (a) Consolidate and verify all available construction records with a view to identifying any gaps in the site inspection records, material testing and design change records.
 - (b) Based on the findings of the consolidation and verification exercise under Part 1a, formulate and implement a proposal for reviewing and ascertaining the as-constructed conditions. For the remaining gaps in relation to the structural integrity of the structure that cannot be closed under Part 1b, they will be addressed in Part 2.
 - (2) Part 2: Conduct a structural review and devise schematic remedial works and a long-term monitoring scheme of the structural performance of the as-constructed CoI 2 Structures, where and to the extent it is necessary.

¹ [BB8/5125-5145].

² [BB8/5146].

3. MTRCL concluded the verification exercise and issued the Verification Report dated 18 July 2019 which was endorsed by the Government. The Verification Report recommended certain actions which are deemed necessary to address the issues identified and to achieve the safety level required in the HKCoP for meeting the requirements of the BO and the established good practice of engineering design, as well as complying with the NWDSM³. These actions, referred to as the “Suitable Measures”, are being implemented for the purpose of obtaining the ultimate approval of the works by the approval authorities so that the railway can be put into operation for use by the general public.

I(i) Coupler connections

4. As set out in paragraph 4.2.6 of the Verification Report⁴, due to the lack of full records of the coupler connection works, it was considered prudent to apply a strength reduction factor in areas where coupler connections have replaced lapped bars on account of the uncertainty of the quality of the workmanship associated with such works. The Task Force Group discussed and considered various options to address issues concerning the structural integrity of the CoI 2 Structures. On balance, the Task Force Group considered that options other than destructive investigation were preferred. After extensive discussions, the Task Force Group considered it appropriate to apply a reduction factor in the CoI 2 Structures by reference to the reduction factors derived from the Holistic Report.

5. The NSL slab of the SAT area is a continuation of the NSL slab in the Hung Hom Station Extension. The statistical analysis carried out in the Holistic Report showed the reduction factor for the NSL slab was 33.2%. The Task Force Group took 33.2% as a starting point and adopted 35% to

³ §15 of the Verification Report [BB16/9957].

⁴ [BB16/9976].

give a greater, sufficient level of confidence. As the nature of the coupler connection works and the site conditions in other areas of the CoI 2 Structures were less complicated than the NSL slab of SAT in terms of their construction, it was considered that the use of a reduction factor of 35% would be appropriate⁵.

6. As set out in paragraphs 4.5.1 to 4.5.2 of the Verification Report⁶, the NAT and SAT structures and other locations such as the underpass corridor, culvert, track slab and NFA tie beam have sufficient spare structural capacity at critical coupler locations even after applying the strength reduction factor of 35%. For the HHS structures, the spare structural capacity at critical coupler locations in the trough wall kickers near movement joints is less than the assumed strength reduction factor of 35%. Suitable Measures are therefore recommended in the Verification Report for code, statutory and contractual compliance purposes. For other locations such as the underpass corridor, culvert, track slab and NFA tie beam, the spare structural capacity is greater than the assumed strength reduction factor of 35%. Suitable measures are therefore not required.
7. The structural engineering experts have set out areas of agreement and disagreement in their Memorandum of Agreement and the Supplemental Memorandum of Agreement. McQuillan, Glover and Southward agree that the CoI 2 Structures are safe and fit for purpose. Lau, however, is of the opinion that without the implementation of Suitable Measures, the as-built CoI 2 Structures are neither safe nor fit for purpose⁷.
8. Specifically in relation to the HHS trough walls⁸:-

⁵ §7 of CoI 2 Statistical Report [ER[CoI2]/Item 3/3].

⁶ [BB16/9978].

⁷ [ER(CoI2)/Item 15.2].

⁸ [ER(CoI2)/Item 14.3].

- (1) McQuillan, Glover and Southward agree that Yield Line Analysis is valid in this Ultimate Limit State and is not linked to a shear assessment where stirrups and ties would be required. There is no safety issue with the HHS trough walls.
- (2) Lau disagrees with the other experts because the podium columns require to be protected against accidental impact. He adopts AECOM's analysis.
- (3) McQuillan, Glover and Southward also recognise the need for column protection and are satisfied that the existing trough walls provide the necessary protection.

I(ii) Conservatism of the reduction factor outside the scope of the Further SE Directions

9. For the reasons set out in paragraphs 11, 12, 29 and 35 of MTRCL's Closing Submissions on Further Expert Evidence for the Original Inquiry, pursuant to the Further SE Directions, the CoI is not concerned with assessing the reasonableness of the conservatism adopted in the Verification Report.
10. As Glover has pointed out⁹, the application of the reduction factor of 35% in the Verification Report was entirely from a compliance perspective and was not derived from any engineering considerations. Glover opines that based on the assessment carried out by AECOM, if the reduction factor of 35% is not applied, the utilisation rates of the HHS structures are below 100% and the structures are safe and fit for purpose¹⁰.
11. Further, purely from a structural engineering perspective and putting aside the matter of code, statutory and contractual compliance:-

⁹ §5.4 of Glover's CoI 2 Expert Report [ER(CoI2)1/Item 12/8].

¹⁰ §5.5 of Glover's CoI 2 Expert Report [ER(CoI2)1/Item 12/8].

- (1) Glover opines that AECOM’s mathematical model is conservative because it has not taken into account the absorption and dissipation effects of the soil mass behind the walls and the thin slab at the top of the wall¹¹. McQuillan agrees that that the soil fill between the trough walls absorbs significant energy and restricts the deformation of the impacted wall section¹².
 - (2) Further, McQuillan observes that the reduction factor is derived from an analysis based on couplers with 37mm engagement. He points out that the strength reduction factor, which is documented in his CoI 1 Supplemental Report (and is now the subject of agreement between Glover and Southward) should be calculated by reference to 32mm engagement, and hence the reduction factor to be applied from the Holistic Report to the Verification Report should correspondingly be significantly lower¹³.
12. Southward adopts the Yield Line Analysis to demonstrate that the HHS trough walls have a large degree of spare capacity. According to McQuillan, Southward’s approach has “*irrefutably proved, in spite of the very significant strength reduction factor, that the trough walls are safe and have significant reserve capacity*”¹⁴. Glover accepts that the Yield Line Analysis is in principle feasible, but it is an upper-bound solution which can be non-conservative¹⁵. More importantly, whether the approving authorities would accept Southward’s Yield Line Analysis as ‘part and parcel’ of the process of obtaining the ultimate approval of the use of the works is a matter of code, statutory and contractual compliance¹⁶.

¹¹ Glover’s Presentation Slide No. 24 [ER(CoI2)1/Item 12.2/24] and §5.14 of Glover’s CoI 2 Expert Report [ER(CoI2)1/Item 12/10].

¹² §24 of McQuillan’s CoI 2 Expert Report [ER(CoI2)1/Item 11/23-24].

¹³ §32 of McQuillan’s CoI 2 Expert Report [ER(CoI2)1/Item 11/25-26]

¹⁴ §56 of McQuillan’s CoI 2 Expert Report [ER(CoI2)1/Item 11/31].

¹⁵ Glover’s Presentation Slide No. 24 [ER(CoI2)1/Item 12.2/24].

¹⁶ §5.13 of Glover’s CoI 2 Expert Report [ER(CoI2)1/Item 12/10].

13. Lau's CoI 2 Report sets out his original concern that Southward's adoption of the Yield Line Analysis was premised on the contention that no stirrups or ties (i.e. shear links) have been provided in the trough walls in question. At the hearing, Lau retracted his concern on this aspect of the matter when LCAL's Leading Counsel showed Lau that, according to AECOM (whose analysis Lau adopted), no shear link was in fact required:-

Q. But if it actually has been done, is Mr Southward not entitled to rely on it?

*A. Well, it's only one comment, but anyway I think the more important point is -- what I said in my report is that according to the American Code he used, they said there's a requirement that you should check the shear when you use the yield line method. That's what I mean. As far as I'm concerned, if he checks it, I think he can pass it as well. I'm not saying that he will fail in shear. What I'm saying is he did not check it. That's all. That's what I said. In fact even yesterday I said the same thing*¹⁷.

14. As regards Lau's concern about the columns, it is equally misconceived as no calculation has been put forward by Lau. As set out above, McQuillan, Glover and Southward are all satisfied that the existing trough walls provide the necessary protection.

I(iii) Shear links

15. The Verification Report sets out the shear link issues¹⁸. Specifically:
- (1) Defects in the shear link placement were first discovered when the shear links at the EWL slab soffit were exposed when investigations into the honeycombing in the concrete were carried out;

¹⁷ Entire Inquiry [T10/24:14-25].

¹⁸ §§3.2.6 to 3.2.9, 4.5.3 to 4.5.4 of the Verification Report [BB16/9970, 9978].

- (2) Further investigations were conducted at other locations at the EWL slab on the as-constructed condition of shear link placement. Defects regarding anchorage and/or spacing of shear links were discovered;
 - (3) These investigations raised questions in relation to the workmanship of the shear link placement in the CoI 2 Structures;
 - (4) A strength reduction factor was adopted to address the gaps in the rebar testing records;
 - (5) For the NAT and HHS structures, the spare structural capacity at critical shear locations is greater than the assumed strength reduction factors; and
 - (6) For the SAT structures, the spare structural capacity at the critical shear locations of the EWL trough is greater than the assumed strength reduction factors. However, in view of the concern about the unsatisfactory shear link placement in Area A of the NSL slab adjoining the SAT, Suitable Measures to enhance the shear strength will be applied at the SAT NSL tunnel box.
16. Putting aside the issue of code, statutory and contractual compliance, McQuillan, Glover and Southward agreed that the as-built CoI 2 Structures are safe and fit for purpose¹⁹. In particular, the three experts agreed that²⁰:
- (1) In the areas where nominal/minimum shear reinforcement is required, there is some 25% over-provision, or more, in the shear links installed;
 - (2) The shear links provided should not be disregarded in their entirety;

¹⁹ Supplemental Memorandum of Agreement [ER(CoI2)1/Item 15.2/1].

²⁰ §§2 and 5 of Memorandum of Agreement [ER(CoI2)1/Item 14.3/2-3].

- (3) The actual proven concrete cube strengths should be used in the structural shear assessment and, furthermore, concrete strength gain with time is a legitimate consideration;
 - (4) There are other beneficial factors which could be considered, e.g. compressive action and arch action;
 - (5) Codes allow, when retro-analysing (forensically) a structure, the safety factors to be reviewed, e.g. the use of actual loads and actual material properties; and
 - (6) In one potential “hotspot” (i.e. the NSL slab at SAT), failure cannot occur because of the load redistribution in the three-dimensional structure.
17. MTRCL submits that nothing in Lau’s dissenting views should be taken as undermining the majority view that any workmanship issue concerning the shear links does not affect the structural integrity of the structures. It is MTRCL’s position that the Suitable Measures are required as a result of LCAL’s breach of its obligations to properly install the shear links in the Project. The issue of Suitable Measures is not relevant for the purposes of determining whether the CoI 2 Structures are safe and fit for their purpose as per the Further SE Directions since the Suitable Measures are for the purposes of code, statutory and contractual compliance.
- I(iv) Rebar testing
18. As set out at paragraph 4.3.2 of the Verification Report, the approach adopted therein was not a statistical approach. In any event, no Suitable Measures are required as a consequence of the missing rebar testing records²¹.

²¹ [ER(CoI2)1/Item 3].

19. As Glover correctly noted, since it can be demonstrated on a fitness for purposes basis that the structure does not require shear link reinforcement, any consideration of using a reduced steel strength, even assuming that all or some of the untested steel did not pass the HOKLAS test, does not arise²².

II. Project Management

20. The CoI received written reports and heard oral evidence from three PM experts during the course of the hearing concerning the construction works at and near the Hung Hom Station Extension under the SCL Project: Steve Huyghe ('Huyghe') gave evidence on behalf of MTRCL; George Wall ('Wall') gave evidence on behalf of LCAL; and, Steve Rowsell ('Rowsell') gave evidence on behalf of the CoI. The PM experts gave their evidence against the background of the CoI's expanded ToR²³.
21. Rowsell served a PM expert report dated 23 August 2019. The CoI's Direction²⁴ concerning MTRCL's and LCAL's expert PM evidence resulted in Huyghe serving a PM expert report dated 21 September 2019 and Wall served one dated 20 September 2019. In accordance with the CoI's Direction made on 24 September 2019, Huyghe then served a Supplemental PM expert report dated 30 September 2019 which presented his further opinions regarding LCAL's PM procedures and how LCAL may have caused or contributed to the work which was the subject-matter of the Extended Inquiry being executed other than in accordance with the Contract and took into account Wall's comments set out in his expert report dated 20 September 2019 to the extent that they were relevant to the issues covered in Huyghe's Supplemental PM expert report. It should be noted that neither Huyghe's nor Wall's PM reports addressed the issues

²² §7.2 of Glover's CoI 2 Expert Report[ER(CoI2)1/Item 12/13].

²³ [AA1/1].

²⁴ [AA1/261].

pertaining to Government's monitoring and control mechanisms, and nor does this Closing Statement.

22. On 3 September 2019, a 'without prejudice' meeting took place between all three PM experts followed by telephone conferences and the PM experts are to be congratulated for producing a comprehensive Joint Statement dated 2 October 2019²⁵. Paragraph 6 of the Joint Statement made it clear that it followed on from a similar statement produced by Rowsell and Huyghe covering PM issues canvassed during the Original Inquiry wherein suggestions were put forward on how MTRCL could improve aspects of its PM systems and procedures, and explained the further suggestions set out in the Joint Statement had to be read in conjunction with the joint statement made for the Original Inquiry. The nature and extent of the agreements resolved between the PM experts as set out in the Joint Statement, substantially reduced the nature and extent of the PM experts' oral evidence that needed to be ventilated before the CoI during the course of the Extended Inquiry hearing and, of necessity, rendered redundant large tracts of their PM expert reports.

23. Wall did not agree with the following paragraphs of the Joint Statement:

“16. Mr. Rowsell and Mr. Huyghe agree that MTRCL did establish a RISC administrative system. However, with regards to the NAT, SAT and HHS areas, Leighton did not submit RISC Forms for all formal inspections and MTRCL continually requested that the RISC forms be provided but did continue to carry out inspections in the absence of all RISC Forms. A series of NCR's were later issued by MTRCL on 16 April 2018 and 6 July 2018.

²⁵ [ER(CoI2)1/Item 9].

17. *Mr. Rowsell and Mr. Huyghe agree that due to not receiving all the RISC forms from Leightons, MTRCL should have eventually conducted joint meetings to come up with a formalized alternative process. It is apparent that this was not done by those involved as both parties were focused on not affecting the progress of the work.*

...

Inspection Procedures

26. ...

c. *Whilst the use of Lenton couplers was identified at an early stage at the interface stitch joints in the NAT area, it does not appear that the associated requirement for tapered reinforcement bars was communicated to Leighton's site teams Mr. Rowsell and Mr. Huyghe agree that annotated drawings would have helped to identify the Lenton couplers used on Contract 1111. A Method Statement should have been prepared by Leighton's for the couplers used in locations for site access."*

24. Both Rowsell and Huyghe are self-evidently highly experienced in the PM field, a fact which the Chairman of the CoI recognised expressly so far as Huyghe was concerned when LCAL's counsel sought to object to some of the evidence that Huyghe had given during the course of making his presentation [T16/58:23-59:9]. On the other hand, it became apparent in the cross-examination of Wall by the CoI's Leading Counsel that the majority of matters on which Wall had previously given expert evidence, either orally or in the form of expert reports, were in relation to delay, although some related to quantum and defects. Indeed, Wall readily accepted during the course of this part of his cross-examination that he had

never given evidence or written a report specifically on PM issues before²⁶. The CoI's Leading Counsel also established during the course of his cross-examination of Wall that not only had he been a previous LCAL employee for a number of years in the relatively recent past, but that even after the employer/employee relationship ceased, Wall continued to assist LCAL with some programming issues on one of the XRL projects that LCAL was involved in when he did some work for a claims consulting firm that LCAL had engaged to assist it. In circumstances where expert witnesses must be, and be seen to be, truly independent, it is regrettable to say the least that Wall had prior very close connections with LCAL. Whilst MTRCL does not go so far as to submit that all of Wall's views on PM issues should be given little, or even no, weight, it does submit that Wall's evidence should be approached with a degree of caution.

25. Notwithstanding, it has to be said that insofar as Wall was disagreeing with Rowsell's and Wall's agreement in paragraph 16 of the Joint Statement that "*However, with regards to the NAT, SAT and HHS areas, Leighton did not submit RISC Forms for all formal inspections and MTRCL continually requested that the RISC forms be provided ...*", he was ignoring the wealth of evidence put before the CoI that MTRCL did in fact chase LCAL persistently for the late/missing RISC forms over a prolonged period of time both orally and in writing, including the following:

(1) Various members of MTRCL's construction management ('CM') team made complaints and requests to LCAL on numerous occasions for the late/missing RISC forms in what in the event transpired to be a vain attempt to address LCAL's persistently poor performance in respect of RISC form submissions:

(a) As early as 2014, MTRCL's Dick Kung, its then SIO, W,

²⁶ [T17/21:4-20].

complained to LCAL's Kevin Harman about deficiencies in RISC form submissions²⁷, which prompted LCAL to consider possible avenues for improvement²⁸;

- (b) Kit Chan, MTRCL's Construction Manager for Contract 1112 from November 2014 to May 2016, first raised the issue with LCAL in or around May 2015, and LCAL's Kevin Harman conducted investigations and identified in a series of documents entitled '*MTR Outstanding Submission Responses 5-Week Rolling View*' that LCAL was making '*late RISC submissions*' (Item 36A) and '*not submitting RISC records inspection requests*' (Item 36B). LCAL did not have any immediate solution to resolve the problem, and the planned dates for resolution were continuously deferred²⁹;
- (c) CK Cheung, a MTRCL ConE II, issued an email to LCAL's Roger Lai dated 15 May 2015³⁰ concerning the late submission of RISC forms for the works at 1875 MH035-034, pointing out that a one-month delay in submitting RISC forms was unacceptable³¹;
- (d) Sebastian Kong, MTRCL's Graduate Engineer with responsibility for the HHS area, said that on a number of occasions he reminded LCAL's Matthew Tse and Jeff Lii when he met them on site or spoke to them over the phone to submit the relevant RISC forms for sign-off, but LCAL failed to follow-up on those reminders³²;

²⁷ [BB8/5787-5788].

²⁸ §21 of the witness statement of Tung Hiu Yeung (SAT and HHS) [BB8/5252-5253].

²⁹ §§36 to 41 of the witness statement of Chan Kit Lam (NAT, SAT and HHS) [BB8/5197-5198].

³⁰ [BB8/5690-5691].

³¹ §22 of the witness statement of Tung Hiu Yeung (SAT and HHS) [BB8/5253].

³² §15 of the witness statement of Kong Sebastian Sai Kit (HHS) [BB8/5247].

- (e) Tony Tang, MTRCL's IoW who was responsible for the NAT area, made repeated oral complaints to LCAL's Henry Lai, Chan Hon Sun and Joe Tam between 2016 and 2017. Tony Tang also raised the issue with Kenneth Kong (MTRCL's SIoW at the time), who issued an email to LCAL's representatives dated 24 March 2017³³ complaining about LCAL's failure to submit RISC forms for hold point inspections at the CoI 2 Structures, and requested LCAL '*to take immediately [sic] follow up action for this issue*'³⁴; and
- (f) Victor Tung, MTRCL's SIoW II who was responsible for the SAT and the HHS areas, created a number of WhatsApp groups to keep records and facilitate communication. For example, on 30 June 2015 MTRCL attempted to chase LCAL for '*hardcopy of inspection form*' in the '*HHs1875 MH34-36*' and '*New underpass*' groups, and similar complaints were made in the '*HHS Inspection Group*'/'*Inspection Group*'³⁵;
- (2) The CoI is also reminded that during the course of their cross-examination LCAL's witnesses readily accepted the fact that complaints were made by MTRCL³⁶, as well as conceding that such complaints were made substantially earlier than LCAL's original position³⁷.

26. Wall's apparent ignorance of the evidence of complaints as referred to above was, not surprisingly, raised with him by Leading Counsel for the CoI during the course of his cross-examination of Wall in the light of the

³³ [BB4/2245-2247].

³⁴ §§25 to 28 of the witness statement of Tang Siu Hang, Tony [BB1/126-127] (NAT); see also §§4 to 5 of the 4th witness statement of Joe Tam [CC6/3784-3785].

³⁵ §§26 to 32 of the witness statement of Tung Hiu Yeung (SAT and HHS) [BB8/5253-5255].

³⁶ See Henry Lai's evidence [T5/103:9-108:14].

³⁷ See Joe Tam's evidence [T8/177:8-184:13].

completely inaccurate statement made in paragraph 50 of his PM report that “*MTRCL did not raise the lack of RISC forms with Leighton’s management (other than by sending a single email in 2015) ...*” and, after a degree of vacillation, the Transcript records that Wall finally accepted the position which was being put to him [T17/35:25-41:5]. However, when Counsel raised the nature and extent of Wall’s disagreement with paragraph 16 of the Joint Statement at a later stage in his cross-examination, Wall then disagreed with that part of the paragraph which read “... *and MTRC continually requested the RISC forms be provided...*” [T17/50:2-52:10] Putting aside the contradictory nature of Wall’s answers, Wall’s final answer in terms of what he disagreed with in paragraph 16 of the Joint Statement was simply not credible, does him no credit having regard to the evidence which is referred to above and should be disregarded. However, this is not the end of this particular matter because Wall was also cross-examined on the extent to which LCAL was reminded by MTRCL to submit RISC forms by MTRCL’s Leading Counsel. This aspect of Wall’s cross-examination commenced by reference to paragraph 50 of the Wall PM Report, where he had stated “... *MTRCL did not raise the lack of RISC forms with Leighton’s management (other than sending a single email in 2015³⁸) until after the defects in the stitch joints were identified (at which point they issued NCRS in relation to the outstanding RISC forms in the NAT and SAT areas³⁹)*”. Wall confirmed that the part of paragraph 16 of the Joint Statement which he disagreed with was that part which has already been identified in the previous paragraph herein, at which point the evidence referred to in paragraph 25 above were put to Wall [T17/74:14-82:2]. It was then put to Wall that in the light of the evidence he had been shown, and assuming that such evidence was

³⁸ [CC10/6208-6209].

³⁹ [BB12/8389-8446].

accepted by the CoI, Rowsell and Huyghe were correct to agree in paragraph 16 that MTRCL continually requested that the RISC forms be provided. This time Wall changed his position from his previous answer as referred above by saying that he would say "... *continually verbally requested*", *I think, to complete the sentence [in paragraph 16 of the Joint Statement]*" [T17/82:3-10]. Whilst this was a move in the right direction as Wall was finally conceding that at least oral requests for the RISC forms had been made continually, Wall was wrong to contend that notwithstanding the evidence which is referred to in paragraph 25 above there were only two emails from MTRCL to LCAL requesting the RISC forms to be provided - one in 2015 and one in 2017 [T17/82:11-83:2].

27. As to Rowsell's and Huyghe's agreement in paragraph 16 of the Joint Statement that "*A series of NCR's were later issued by MTRCL on 16 April 2018 and 6 July 2018*", again it has to be said that there was a plethora of evidence placed before the CoI to support the fact that MTRCL issued NCRs to LCAL in respect of its failure to serve RISC forms timeously or at all:

- (1) On 17 April 2018, MTRCL issued 69 NCRs for the NAT and 31 NCRs for the SAT to record the RISC forms which were considered to be missing⁴⁰;
- (2) On 10 July 2018, MTRCL issued 47 NCRs for the NAT and 9 NCRs for the SAT to record the RISC forms which were also considered to be missing after further investigations⁴¹;
- (3) On 7 March 2019, MTRCL issued one NCR to record all the RISC forms which were considered to be missing for the HHS after an

⁴⁰ §§19 to 23 of the supplemental witness statement of Fu Yin Chit (NAT, SAT and HHS) [BB8/5223-5224].

⁴¹ §24 of the supplemental witness statement of Fu Yin Chit (NAT, SAT and HHS) [BB8/5224].

extended investigation⁴²; and

- (4) On 15 March 2019, MTRCL issued 4 more NCRs for the NSL structure in the SAT to record the RISC forms which were also considered to be missing after further investigations⁴³.

28. As for Wall's refusal to agree with Rowsell and Huyghe the contents of paragraph 17 of the Joint Statement (i.e. that due to not receiving all the RISC forms from LCAL, MTRCL should have eventually conducted joint meetings to come up with a formalised alternative process but this was not done by those involved as both parties were focused on not affecting the progress of the work), during the course of his cross-examination by the CoI's Leading Counsel Wall did accept finally that the lack of RISC forms should have been raised by both parties at a high level [T17/41:6-10]:

“Q. Do you think MTR or Leighton's management – Leighton's management should have raised this with MTR at a high level and, if so, at what level?”

A. Yes, I think it should have been raised by both parties at a high level.”

However, when the proposition set out in paragraph 17 of the Joint Statement was put to Wall by the CoI's Leading Counsel in cross-examination, he said that he disagreed with it because “... *there was an adequate process in place, I mean notwithstanding the time taken with paperwork, et cetera, but there was an adequate process in place. That should have been enforced. I see no need to have a kind of group discussion about alternative arrangements*” [T17/52:11-24] Notwithstanding, when the CoI's Chairman took over the questioning Wall 'changed his tune' somewhat and agreed that the methodology referred to in paragraph 17, i.e.

⁴² §25 of the supplemental witness statement of Fu Yin Chit (NAT, SAT and HHS) [BB8/5224].

⁴³ §25 of the supplemental witness statement of Fu Yin Chit (NAT, SAT and HHS) [BB8/5224].

conducting joint meetings to come up with a formalised alternative approach, was “*a reasonable approach*” albeit not one that he “... *would adopt personally, but I guess that’s a personal view*” [T17/53:10-54:12].

29. Thereafter, Wall’s view changed again when the matter of a joint meeting was raised by MTRCL’s Leading Counsel during his cross-examination and he ultimately accepted that when LCAL finally realised it was not going to be able to comply with its contractual obligations concerning the RISC form process, from a PM perspective, what LCAL should have done was set up a joint meeting with MTRCL with a view to coming up with an alternative formalised process so far as the RISC forms were concerned⁴⁴. In the light of Wall’s evidence as referred to above, and notwithstanding Wall’s original disagreement with the contents of paragraph 17 of the Joint Statement, by the time his cross-examination was over the terms of paragraph 17 of the Joint Statement were for all practical purposes common-ground between all three PM experts.
30. Turning finally to Wall’s disagreement with the terms of paragraph 26c of the Joint Statement, the first part of paragraph 26c states “*Whilst the use of Lenton couplers was identified at an early stage at the interface stitch joints in the NAT area, it does not appear that the associated requirement for tapered reinforcement bars was communicated to Leighton’s site teams ...*”. Wall accepted when cross-examined by Leading Counsel for MTRCL that as Huyghe had opined in paragraph 128 of his PM Report, there had been “... *a breakdown in the transmission of information*” by reference to what LCAL had conceded in its own Closing Submissions [T17/113:14-115:1]. It follows that ultimately there was no material disagreement between all three PM experts so far as this element of paragraph 26c was concerned.

⁴⁴ [T17/105:5-106:7].

31. The balance of paragraph 26c continued as follows “... *Mr. Rowsell and Mr. Huyghe agree that annotated drawings would have helped to identify the Lenton couplers used on Contract 1111. A Method Statement should have been prepared by Leighton’s for the couplers used in locations for site access.*”. Wall’s cross-examination on this aspect of the matter commenced by Leading Counsel for MTRCL referring him to paragraph 47 of his PM Report where he had stated “*I disagree with Mr Rowsell’s statement that the absence of a method statement specific to the stitch joints is a failure to deliver the contract requirements. There is no explicit provision in appendix Z2 of the particular specification that requires a distinct method statement to be provided for the stitch joints*” [T17/106:8-23]. However, it soon became clear as the cross-examination proceeded that paragraph 47 of Wall’s PM Report did not do full justice to his views on this important topic when he accepted that⁴⁵:

- (1) The relevant extract from Appendix Z2 of the Particular Specification set out what the 1111 contractor and the 1112 contractor (LCAL) were supposed to do and required a particular and appropriate level of detail in relation to the SJ, although Wall did not regard it as containing any obligation to provide a *distinct* Method Statement for the SJ;
- (2) If one was talking about the interface location between Contract 1111 and Contract 1112, one of the interface locations would be at the SJ;
- (3) It was as ‘plain as a pikestaff’ that what Appendix Z2 of the Particular Specification was saying was that the Method Statement should take the SJ at the interface into account and provide for it;

⁴⁵ [T17/106:24-113:14].

- (4) Even if the document which made provision for the SJ at the interface did not comprise a distinct document, it would still be a Method Statement;
- (5) The interface location at the SJ was from a PM perspective one of the most important matters at the interface between Contracts 1111/1112;
- (6) In the light of the requirements of the Particular Specification, “*Design Responsibility*” clause P7.3.17 which stated “*The Contractor shall submit the tunnel construction method statement and design drawings for the station and associated tunnels or ducts adjacent to the Contract 1111 within 3 months of Date for Commencement for Approval and Contract 1111 review, and shall coordinate with the Engineer and Contract 1111 to agree and finalise the interface details*”, he would reasonably expect any Method Statement which was submitted by a contractor (in this case LCAL) to contain the agreed and finalised interface details with Contract 1111, including at the SJ;
- (7) In clause P28.3 of the Particular Specification, “*The Contractor shall be responsible for the production of detailed method statements and submission to the Engineer for approval. The Contractor shall allow in his method statements for the coordination of inputs provided by the Designated and Interfacing Contractors*”, the “*Interfacing Contractor*” would be GKJV on Contract 1111;
- (8) Even if it be correct that MTRCL did not enforce the requirement for a Method Statement making provision for the SJ at the interface, having regard to the provisions of clause 2.9 of the CoC such fact would not exonerate LCAL from its contractual obligation to provide such a Method Statement; and

- (9) Huyghe’s opinion that had the Method Statement been prepared, the parties would have had the information to know what they were looking for, as the Method Statement would have set out what should have been at the interface was a “*a reasonable point*”.

Wall also had no hesitation at all in agreeing with the proposition put to him by the CoI’s Leading Counsel that a specific Method Statement for the SJ “*would have been beneficial and helpful*” [T17/35:1-12].

32. By way of conclusion to this part of its submission, and before turning to deal with other important aspects of the PM experts’ evidence, MTRCL submits that in light of the relevant evidence any apparent differences, if indeed any existed between Rowsell and Huyghe on the one hand and Wall on the other hand concerning the terms of paragraphs 16, 17 and 26c of the Joint Statement, have now been resolved. Accordingly, it is further submitted that in preparing its Final Report the CoI can proceed with confidence on the basis the contents of the Joint Statement reflect the views of all three PM experts. On this basis MTRCL has no doubt that the Chairman’s statement that the long-term legacy of the CoI will rest in the PM recommendations that can be made in the Final Report to make sure that problems of the kind referred to in the PM experts’ evidence are not encountered again or, at worst, if they are they will be of a far lesser magnitude in future contracts will come to pass [T18/147:9-15].
33. As the CoI will no doubt recall, Huyghe gave his PM evidence to the CoI against a background of some 50 years’ experience in the construction industry. Huyghe’s presentation in-chief concentrated on four important areas so far as the PM of the Project was concerned: lack of RISC forms; ineffective site inspection; interface management; and, MTRCL’s latest update on management improvements. MTRCL consider it appropriate to deal with each of these four matters in turn.

II(i) Lack of RISC forms

34. This was a matter which Huyghe dealt with in some detail in his PM report dated 21 September 2019⁴⁶ given that it formed the central focus of the PM evidence. It is considered to be an appropriate starting point to any consideration of this aspect of the matter by quoting from paragraph 50 of Huyghe's said report which, happily, records Huyghe agreeing with what Rowsell had said in his report about the RISC form procedure:

“I concur with Mr. Rowsell’s observation with regard to MTRCL’s inspection regime as set out in the contract, the specifications, the PIMS documents and the PMP [paragraph 35 of the Rowsell Report] [ER1 (Part 2)/1/22]. Mr. Rowsell states that “Taken as a whole, the procedures described in the documents would in my opinion, if they had been fully implemented, have provided a robust inspection regime and a good degree of confidence that the works were provided in accordance with specified requirements”. I agree with this opinion, but even though the best PM system can be established, it still requires Leighton’s and MTRCL’s project personnel to follow through and implement the established protocols. In this respect, I can only repeat that Leighton caused all of these tribulations by not fulfilling its contractual obligation and submitting the RISC forms. Leighton was reminded numerous times by MTRCL personnel about the problem of missing RISC forms and the need for such forms to be provided to MTRCL timeously, but to no avail”.

35. For convenience, the contractual basis of the RISC form procedure was set out in paragraphs 4 – 6 (inclusive) of Huyghe's Supplemental PM report⁴⁷.

⁴⁶ §§ 50 to 82 of Huyghe's CoI 2 Expert Report [ER(CoI2)1/Item 6/15-21].

⁴⁷ [ER(CoI2)1/Item 6.3/3].

As opined by Huyghe in paragraph 14 of his Supplemental PM report, LCAL failed to comply with these contractual provisions⁴⁸.

36. Against the backdrop of the agreed position and the relevant contractual requirements referred to in the previous two paragraphs, Huyghe dealt with his perception of what the purpose of the RISC forms was by reference to pages 2 – 4 of his “*SHATIN TO CENTRAL LINK PROJECT*” presentation (‘Presentation’), which was to act as an inspection record because the Project, like all major civil engineering projects, required that joint inspection records were kept to prevent or mitigate defective work, for quality control purposes and for safety [T16/29:14-30:7]. As stated on page 4 of the Presentation, the RISC form “*eliminates rework before concrete placement, the cost of correcting defective work, and moves the project forward*”. Huyghe then helpfully explained by reference to page 5 of the Presentation the Contract 1112 RISC form process which is self-explanatory [T16/30:8-31:1]. Unfortunately, this process was not followed because, and as explained by Huyghe by reference to page 6 of the Presentation entitled “*ACTUAL RISC FORM ADOPTED ON SITE*”, what actually happened was that: LCAL did not sign any RISC forms and it basically informed MTRCL that it was ready for an inspection, often by phone and WhatsApp; LCAL and MTRCL then proceeded to the field and performed the joint inspection; but, no RISC form was signed-off [T16/31:2-31:15]. The CoI is asked to note that Wall readily agreed that what Huyghe depicted as happening on page 6 of the Presentation actually happened⁴⁹.
37. Wall also agreed with the obvious proposition that if one did not have the RISC forms it would not be possible to update the RISC form register

⁴⁸ [ER(CoI2)1/Item 6.3/5].

⁴⁹ [T17/83:3-84:6].

[T17/85:9-13]. The importance of having the RISC forms to enable a contractor to update its quality programme was also a point made by Huyghe when he was questioned on the topic by LCAL's Leading Counsel, albeit that the joint inspections which were conducted should have addressed the quality issues [T16/110:7-23].

38. By way of a summary of the lamentable situation concerning RISC forms, Huyghe accurately summarised the situation as follows: LCAL did not provide all the RISC forms; MTRCL continually requested their submission but to no avail; and, MTRCL did not waive the RISC form procedure, but it was in any event important to point out that clause 2.9 of the CoC stated "*No act or omission on the part of the Engineer shall in any way relieve the Contractor from any liability, responsibility, obligations, or duty under the Contract*", the terms of which are self-explanatory. Neither did Huyghe accept the concept that LCAL was too busy to perform the RISC form procedure either properly or at all, pointing out pertinently that:

- (1) LCAL knew what the RISC form procedure entailed before it signed Contract 1112 and that he was aware from his investigation of the Original Inquiry that for the EWL slab at the Project LCAL actually provided the RISC forms so there was no issue on other parts of the Project;
- (2) LCAL should have made the RISC form procedure a priority and should have provided the resources to make sure that the condition of the contract was fulfilled; and,
- (3) He did not accept the suggestion that because "*MTRCL did not make me do it*" that LCAL was released from its responsibility as a general contractor [T16/32:6-22].

Huyghe also told the CoI that on the basis of the evidence he had reviewed, MTRCL believed that LCAL was going to catch up and prepare the RISC forms and that's why it continued to do what it did, particularly as based on his experience of being a general contractor for over two decades there was a desire for MTRCL to be seen to be co-operating with LCAL, albeit there were contractual obligations that had to be fulfilled [T16/33:22-34:18]. In this context Huyghe explained in his answers to LCAL's Leading Counsel why the situation concerning missing RISC forms never reached the critical stage where it was considered appropriate to suspend the works on the Project pending rectification of the outstanding paperwork [T16/90:8-91:21], as well as the fact that the reason such missing forms might objectively not have appeared to have been on MTRCL's priority list stemmed from the fact that LCAL kept telling MTRCL that it was going to get the missing RISC forms [T16/107:7-18]. In this context, he also expressed the view during the course of his re-examination by reference to the evidence from MTRCL's Victor Tung, an IoW and then a SIoW, that if such evidence was accepted by the CoI it should not have created an impression on the part of LCAL that MTRCL considered the RISC forms were not a priority [T16/125:11-17] – which must be the correct assessment of the situation taking account of such evidence.

39. It is submitted that Huyghe's valuable opinions on this important matter based upon his review of the evidence were given added credibility by the evidence that Wall gave during the course of the early part of his cross-examination by Leading Counsel for MTRCL, during which he accepted without hesitation the following propositions [T17/68:8-74:13]:
- (1) Having worked for LCAL as a sub-agent responsible for the programming of projects and generally PM matters and then as a sub-consultant for a consultant acting for LCAL on the XRL project,

he knew a little bit about the way in which LCAL would approach a project like the Project;

- (2) That LCAL was an apparently competent, responsible contractor who could be taken at its word;
- (3) The RISC form procedure was a very important procedure because amongst other things it contained an inspection regime which if properly operated should ensure that that the ongoing construction works were inspected at various specified hold points and that the work complied with the requirements of the contract before the work progressed any further and was covered up with concrete;
- (4) That in the absence of a complete set of RISC forms it would be difficult to verify or ascertain whether the inspections at the hold-points were in fact carried out as well as being difficult, if not impossible, to establish how the works were carried out⁵⁰;
- (5) The RISC form procedure was a contractual procedure which LCAL was obliged to comply with in accordance with the requirements set out in Contract 1112, the PIMS and LCAL's own QAP;
- (6) LCAL had previous experience in other projects of the need to comply with inspection and record-keeping requirements such as the RISC form procedure, and that as a project manager he would have expected LCAL as an apparently competent and responsible contractor to have familiarised itself with the RISC form procedures before it started the work so that it knew what to do;

⁵⁰ A point which Huyghe also made when he was questioned on the significance of RISC forms by Government's Leading Counsel [T16/118:4 – 11].

- (7) LCAL, from a PM perspective, would have been expected to have satisfied itself that it had in place the necessary procedures and resources to comply with the RISC form procedure;
 - (8) LCAL would have been expected to familiarise itself with the Contract before it entered into the contract and commenced the work;
 - (9) The terms of clause 2.9 of the CoC meant that the contractor LCAL could not say “*Because the engineer let me do it, I did not have to follow the contractual procedures it had agreed to*”; and
 - (10) LCAL had failed to submit all RISC forms it should have submitted timeously or in some cases at all.
40. Subsequently, at a later point in his cross-examination by MTRCL’s Leading Counsel when Wall was questioned about the wealth of evidence from the LCAL witnesses that the RISC forms had not been provided because LCAL’s engineers were constantly busy and fully occupied and whereby they were unable to provide the RISC forms timeously or in some cases at all, Wall candidly accepted that that was the position of the engineers⁵¹. More important, so far as the issue of which party was responsible for the failure to comply with the RISC form procedure is concerned, was Wall’s grudging admission that from a PM perspective the reason the engineers were constantly too busy to comply with the RISC form procedure was due to the fact that LCAL had under-resourced that aspect of the works and as a result of that under-resourcing LCAL took a conscious decision not to comply fully or in some cases at all with the RISC form procedure or, to use his phrase, had “*de-prioritised*” it⁵².

⁵¹ [T17/96:25-97:6].

⁵² [T17/97:7-100:15].

41. Under-resourcing by LCAL was also a matter which Rowsell explained to Counsel for LCAL may have been the explanation for the failure to compile the necessary paperwork in terms of the RISC forms, or failure to manage the resources so that the workload was spread across the resources that were available [T18/27:2-13]. Finally, in this part of his cross-examination Wall was taken through the evidence of MTRCL’s Victor Tung concerning the records in the HHS inspection group which Wall accepted was not the *modus operandi* he would have approved of from a PM perspective⁵³.
42. Returning to Huyghe’s evidence and in response to questioning by the Chairman, Huyghe pointed out that LCAL and MTRCL continued to conduct joint inspections based on a ‘spirit of co-operation’, that LCAL kept on saying that it would catch up on the missing RISC forms and that in circumstances where there was no contractually accepted alternative to be put in place instead of the RISC form procedure LCAL should have suggested a new procedure if it was not going to provide the RISC forms and, if it did not, MTRCL ought to have insisted [T16/36:10-22]. This was consistent with Wall’s view of the matter as set out in paragraph 28 above [see further T17/41:6-10]. In this context, Huyghe’s view as set out on page 9 of his Presentation that “*From a Contractor’s perspective, the joint inspection documentation for rebar/concrete placement is “as important” as the physical work performed on-site*”, and his reasoning in support of such view including the importance of such documentation from a safety perspective, needs to be emphasised [T16/37:14-39:17]. As to safety, it is apposite at this point to remind the CoI of Huyghe’s views as set out in paragraph 10 of his Supplemental PM report where he stated:

“Leighton’s General Manager, Karl Speed, gave evidence in the Original Inquiry that for Leighton “there’s nothing more important

⁵³ [T17/100:17-102:2].

than safety. Then it would be quality, and then programme” [Original Inquiry T16/128:17-129:4], but it is apparent from the evidence that they put programme ahead of quality, and this prioritizing eventually led to gaps in the record-keeping procedures.”

This change of priorities so far as LCAL was concerned was certainly not the action of an apparently competent and responsible contractor and contradicted completely what its General Manager, Karl Speed, had told the CoI.

43. It bears emphasis that the importance of the RISC forms being filled in contemporaneously, or at least very shortly after the inspection to which they related took place, was also emphasised in a discussion which took place between the Chairman and Huyghe⁵⁴.
44. In the context of the RISC form procedure which is being considered by the CoI, it should also be noted that during the course of his cross-examination Wall told MTRCL’s Leading Counsel (by reference to paragraph 64 of his PM report wherein he was responding to something that Rowsell had said in his PM report concerning the RISC form inspection procedure having some “*good components*”) that in both contractual and practical terms LCAL was in the best position to provide both specific details as to the number of RISC forms anticipated for a particular activity as well as a register to track the status of such forms and hold points. There can be no dispute that LCAL provided neither so far as Contract 1112 was concerned.
45. Notwithstanding the failures to comply with the RISC form procedures as referred to above, the absence of RISC forms certainly does not mean that

⁵⁴ [T16/41:10-42:5].

no inspections were carried out of the relevant works or that LCAL's non-conformances went by unchecked and in this respect the CoI will no doubt recall that:

- (1) The general tenor of MTRCL's relevant factual evidence was that its ConEs/IoWs carried out the requisite hold point inspections and gave permission to LCAL before the works in question proceeded to the next stage⁵⁵, which evidence was also consistent with the evidence of the factual witnesses called by both LCAL and W&K's sub-sub-contractor, LEEL⁵⁶;
- (2) The RISC forms were certainly not the only source of contemporaneous records of the construction works and the inspections carried out by MTRCL as photographic records of its daily site surveillance and formal hold point inspections were also kept⁵⁷;
- (3) MTRCL's IoW team also created WhatsApp groups which recorded the *modus operandi* of the hold point inspection process. A number of examples were given by MTRCL's Victor Tung in respect of the works carried out at the Northern Underpass⁵⁸ and the CoI was informed that Victor Tung's *modus operandi* enabled him to fill out

⁵⁵ §20 of the witness statement of Chan Chun Wai Chris [BB1/115] (NAT and SAT); §§16, 28 of the witness statement of Tang Siu Hang, Tony [BB1/125, 127] (NAT); §§13 to 15 of the witness statement of Kong Sebastian Sai Kit (HHS) [BB8/5246-5247]; §§32, 35 and 36 of the witness statement of Tung Hiu Yeung (SAT and HHS) [BB8/5254-5257].

⁵⁶ §§16, 34 and 52 of the 6th witness statement of Karl Speed [CC6/3754, 3757, 3760] (NAT, SAT and HHS); §§7 to 11 of the 2nd witness statement of Henry Lai [CC6/3787-3788] (NAT); §§21 to 23 of the witness statement of Raymond Tsoi [CC6/3795-3796] (SAT); §§20 to 22 of the witness statement of Sean Wong [CC6/3805-3806] (SAT); §§22 to 25 of the witness statement of Jeff Lii [CC6/3814-3815] (HHS); §§23 to 26 of the witness statement of Alan Yeung [CC6/3824-3825] (SAT); §§20 to 22 of the witness statement of Saky Chan [CC6/3844-3845] (SAT); §§21 to 24 of the witness statement of Ronald Leung [CC6/3833-3834] (HHS); §§15(12) and 34 of the witness statement of Ng Man Chun [EE1/371.9, 371.17] (NAT and HHS).

⁵⁷ §12 of the witness statement of Tang Siu Hang, Tony [BB1/123] (NAT); §§10, 14, 25, 32 and 36 of the witness statement of Tung Hiu Yeung (SAT and HHS) [BB8/5250-5251, 5253-5255, 5257].

⁵⁸ §33 of the witness statement of Tung Hiu Yeung [BB8/5255] and §4 of the 2nd witness statement of Tung Hiu Yeung [BB14/9497.2-9497.3].

a substantial number of RISC forms despite their late submission by LCAL⁵⁹.

46. However, conscious of the nature and extent of the missing RISC forms, and in order to provide further confidence of the fact that hold-point inspections did take place irrespective of gaps in the RISC form records, MTRCL engaged WSP as an independent audit consultant to verify that works in the NAT (including the re-construction of the SJ in 2018, but excluding the original construction of the SJ), SAT and HHS were properly inspected⁶⁰. WSP's audit involved reviewing the RISC forms provided by MTRCL for any inconsistencies and/or irregularities, but where RISC forms were unavailable for audit WSP evaluated the supplementary documentation and information available, for example photographs and site diaries, to determine whether there was sufficient evidence of the hold point inspections in question, with the audit outcome signified by “red” (no supporting materials), “yellow” (insufficient supporting materials) or “green” (sufficient supporting materials)⁶¹.
47. Huyghe expressed his opinions on the adequacy of the WSP audit in paragraphs 51 to 58 of his PM report dated 21 September 2019. A summary of his observations on the audit is as follows:
- (1) WSP, an internationally renowned consultancy firm, carried out an audit of the CoI 2 Structures to check if the construction works were properly inspected⁶²;
 - (2) WSP focused on checking and auditing the RISC documentation for the two essential hold-points which were rebar fixing and the pre-

⁵⁹ [T13/20:18-22:17].

⁶⁰ §§11 to 18 of the witness statement of Peter Ewen [BB8/5155-5157].

⁶¹ As Huyghe accepted during the course of his cross-examination by Leading Counsel for LCAL, the existence of a RISC form proving the details of inspection is important, albeit of a lesser degree of importance than the actual fact of the inspection [T16/99:9 – 101:7].

⁶² § 11 of the witness statement of Peter Ewen [BB8/5155].

pour check and produced three reports, each of which adopted the same audit methodology, comprising Phase 1 and Phase 2: one for each of the NAT⁶³, SAT⁶⁴ and HHS⁶⁵;

- (3) Phase 1 of the audit included a detailed review of each available RISC form for the two essential hold-points in order to address the necessary records from the perspectives of completeness, relevance, and authenticity⁶⁶;
- (4) Phase 2 of the audit comprised the evaluation of supplementary documentation and information, such as the site photos provided by MTRCL's CM team, site diary entries, and recorded work activities, that was available to determine, notwithstanding that the RISC forms were inadequate in one or another respect, whether sufficient and satisfactory site supervision of the hold-points could nevertheless be evidenced⁶⁷. Specifically, Huyghe pointed out that the intent of the Phase 2 audit was to provide "*a secondary level of confidence that quality supervision had been conducted, by the MTR CM Team, for works where no RISC form can be provided or the RISC form is inconsistent*"⁶⁸;
- (5) The WSP audit established that: 100% of the essential inspection hold-points for the SAT construction works could be validated through the available RISC forms or the supplementary/supporting information⁶⁹; for the NAT, the same validation of the essential

⁶³ [BB11/7625-7646].

⁶⁴ [BB13/9199-9218].

⁶⁵ [BB16/10004-10028].

⁶⁶ [BB16/10016].

⁶⁷ [BB16/10017].

⁶⁸ [BB16/10017].

⁶⁹ [BB13/9218].

inspection hold-points reached 96.1%⁷⁰; and, for HHS it reached 88.3%⁷¹; and

- (6) The WSP audit report for HHS concluded that⁷²: *“Given the random nature of the small percentage of hold points across the site construction works where supervision could not be evidenced, and the general weight of evidence that the works on site were being adequately supervised, it is not unreasonable to be confident that the same strong site inspection regime would have been applied to all elements of structure, including those with less compelling physical evidence, as was confirmed verbally by the project staff interviewed during the audit”*

Huyghe justifiably concluded that the WSP audit reports provided another independent view that the works were inspected by MTRCL prior to the subsequent work being allowed to commence, thereby providing assurance that the necessary inspections took place notwithstanding the missing RISC forms.

48. In the light of what Huyghe had observed and opined concerning the WSP audit and, in particular, what it had established, Leading Counsel for MTRCL took the opportunity to discuss paragraph 75 of Rowsell’s PM report with him during the course of his cross-examination which stated as follows:

“Issues A and B discussed earlier in this report on the lack of RISC forms and ineffective inspections include detailed failings in relation to site supervision and record keeping requirements. The consequences of those failures may have been reduced if other

⁷⁰ [BB11/7646].

⁷¹ [BB16/10027].

⁷² [BB16/10027].

requirements had been comprehensively provided. For example, PIMS requires all site staff to produce individual daily site diaries which should record events such as inspections carried out. PIMS also requires that records shall be legible, readily identifiable and retrievable. If these PIMS requirements had been followed then there would have been a safety net to the lack of RISC forms and replacement records could have been established.”

Of particular interest in the light of what Huyghe had said about the WSP audit was Rowsell’s contention that there was no “*safety net to the lack of RISC forms*”.

49. This cross-examination exercise involved the nature and extent as well as the findings of the audit which was carried out by WSP, who he acknowledged was an internationally renowned independent audit consultant, being put to Rowsell [T18/131:2-138:20]. What became apparent as Rowsell’s questioning continued was that his complaint was not so much that WSP’s audit did not constitute a safety net, but that so far as he was concerned it was not a very satisfactory safety net to have in place if the RISC procedures broke down because there were more efficient ways of doing it than the separate appointment of another firm of consultants⁷³.
50. Both MTRCL and Huyghe would readily accept that there is often more than one way of achieving an objective and, indeed, that there is more often than not room for improvement so far as any particular exercise or procedure is required, but in the light of Huyghe’s evidence it was incorrect for Rowsell to contend, and it would be similarly incorrect for the CoI to

⁷³ [T18/136:24-138:22].

find, that there was no ‘safety net’ to cater for a situation where, as here, the RISC procedures broke down.

II(ii) Ineffective Site Inspection

51. Huyghe dealt with this matter primarily in paragraphs 83 – 120 of his PM report dated 21 September 2019 and on pages 11 – 22 of his Presentation. In terms of summarising the joint inspections without RISC form procedures, Huyghe explained that there were 4 candidates that he had seen in the witness statements; the Lenton couplers issue with the tapered rebar; couplers not exposed; missing couplers; and, incorrect coupler layout [T16/43:5-11]. Then, having explained what he referred to as ‘the NMF rule’, or “*not my fault rule*”, Huyghe dealt in his evidence in-chief with each of his ‘candidates’ as referred to above.
52. Starting with the Lenton couplers issue with the tapered rebar, Huyghe explained that there were all kinds of Lenton couplers, but that Lenton was only one manufacturer, and there were all kinds of couplers that could be used and they had advanced over the years [T16/43:22-44:6]. Importantly, when one ran into a situation where one had a Lenton coupler without tapered rebars, the solution was to utilise a portable taper machine of the kind that is used on the site of large civil projects to prepare the necessary tapered rebars⁷⁴, with a number 10 bar taking about 10 minutes to put the necessary taper on - and that one would not try to screw in a parallel bar and leave it unconnected and the concrete does not get poured unless the rebar is fixed [T16/44:7-45:17].
53. Of course, the CoI will recall that the factual evidence that was placed before the CoI was to exactly the opposite effect of what Huyghe said should have been done, and any mismatch between the threaded rebars

⁷⁴ A photograph of a portable taper machine is shown on page 18 of Huyghe’s Presentation [ER(CoI2)1/Item 6.4/18].

used by LCAL and the Lenton couplers at the Contract 1111/1112 interfaces of the SJ and the Shunt Neck CJ was caused by an admitted communication breakdown within LCAL, and as to which the relevant factual evidence was *inter alia* that:

- (1) At all material times, LCAL was well aware of the use of Lenton couplers (apart from the use of BOSA couplers for the T40 rebars at the top mat of the base slab of the Shunt Neck CJ⁷⁵) by GKJV at the Contract 1111 side of the 1111/1112 interfaces, and the fact that BOSA T40 rebars (which were not taper-threaded) could not be screwed into the Lenton couplers. In fact, and as acknowledged by LCAL's witnesses⁷⁶, '*certain members of LCAL's construction engineering team were aware*' of this because it was specifically and extensively discussed at, *inter alia*, the 8th to 12th and 14th to 22nd 1111/1112 Interface Meetings between 2014 and 2017, the minutes⁷⁷ of which recorded that the Material Related Submission Form for Lenton couplers was tabled by GKJV, and that LCAL would '*check with their supplier regarding compatibility in later stage*'⁷⁸;
- (2) Notwithstanding, LCAL failed to ensure that this important information was communicated to the responsible personnel within LCAL (particularly, Henry Lai), and as a result LCAL failed to order Lenton threaded rebars for the construction of the SJ and the Shunt Neck CJ at the Contract 1111/1112 interfaces; and

⁷⁵ See the accepted drawing of Contract 1111 no. 1111/B/352/ATK/C12/931 [DD7/10381].

⁷⁶ §§27, 28, 29 and 46 of the 5th witness statement of Karl Speed [CC1/59, 62-63]; §14 of the 3rd witness statement of Joe Tam [CC1/84].

⁷⁷ [BB3/1678-1795]; §14 of the witness statement of Jim Wong [CC10/6517]; §11 of the witness statement of Regina Wong [CC10/6520].

⁷⁸ §§11 to 16 of the witness statement of Chan Chun Wai Chris [BB1/109-114]; §§16 to 17 of the witness statement of Lee Chiu Yee, Jacky [BB1/96-97].

(3) Karl Speed, LCAL's General Manager, accepted that it was LCAL's responsibility to ensure that tapered threaded rebar was ordered and used to insert into those couplers⁷⁹, so LCAL's responsibility in this regard is undisputed.

54. Rowsell was asked about defects at the SJ during the course of his cross-examination by Leading Counsel for MTRCL. Having confirmed by reference to paragraph 55 of his PM report that the lack of RISC forms was of little consequence in the event that the steel fixing work and the coupler connections had been undertaken properly in the first place, he explained that the inspection procedure was that LCAL had to offer up the steel fixing works and coupler connections for inspection in the first place so that the MTRCL inspectors could inspect them [T18/120:5-22]. Rowsell was then shown a series of photographs⁸⁰ showing good examples of where LCAL had failed to connect rebars to couplers at the SJ and agreed wholeheartedly with the propositions which were put to him, which were that he would have expected LCAL's field inspectors to have picked up such obviously defective works in the performance of their supervisory duties and that such works should not have been offered up to MTRCL for inspection in the first place always assuming, of course, that such works had been offered up for inspection as the RISC form had to be signed to the effect that the works in question complied with the contract [T18/120:23-122:16]. The probability is that such works were not offered up to the MTRCL inspectors for inspection because if they had been it is inconceivable that the works would have been approved so that the concrete pouring could commence – and there was certainly no advantage from MTRCL's

⁷⁹ [T8/14:1-12].

⁸⁰ [DD14/15341-15343].

perspective in such palpably defective works being approved by its inspectors⁸¹.

55. The same photographs were put to Wall by MTRCL's Leading Counsel during the course of his cross-examination and he readily agreed that [T17/85:15-91:17]: they showed appalling workmanship that one would not want to find; that such workmanship should have been picked up by LCAL's field supervisors and inspectors, as well as by LCAL's workers during the installation process; that such work should not have been made available for any formal hold-point inspection; and, from a PM perspective if he had seen such defective work i.e. tapered bars not screwed in, couplers not aligned and missing couplers, during the process of the works at the very least he would have raised an internal LCAL NCR which was followed through and 'closed out' before the work was offered up for another inspection as well as wanting to know who was supervising that part of the work and he would have expected the MTRCL supervisors to do the same – which latter point MTRCL would accept as being a 'fair point' assuming, of course, that such defective works were ever offered up for inspection and as to which the CoI will recall that there was a considerable debate during the course of the factual evidence hearing.
56. As to why serious problems of the kind which existed *inter alia* at the SJ occurred in the first place, Huyghe based upon his long experience in the construction industry concluded that what probably happened was that the contractor was pushing to get the concrete poured at the same time as the rebar fixing foreman was pushing to get his works done and with the result that no inspections were carried out and the concrete was poured with the

⁸¹ Huyghe not surprisingly accepted when questioned on the photographs in question by Government's Leading Counsel that in relation to hold-point inspections they at least cast doubt on whether supervision by all parties had been properly done [T16/119:14 – 120:25], but again this evidence begs the question as to whether the works were actually offered up to MTRCL inspectors for inspection.

defective work in place – and if inspections had been carried out the defective work could have been seen [T16/47:25-49:4]⁸². Wall’s evidence was also supportive of Huyghe’s evidence as to the unlikelihood of inspections taking place as he told Government’s Leading Counsel during the course of his cross-examination that having looked at the photographs it was reasonable at least for one to cast doubt on whether an inspection actually took place at that location [T17/138:18-24]. Huyghe also explained that the scheduling of the concrete pour and the fact that the concrete supplier might have been on site waiting to pour the concrete might also have been a factor as to why the concrete was poured over the defective work [T16/49:6-50:12]. Huyghe’s explanations as to why the concrete was poured when there were such obvious defects in LCAL’s and/or its sub-contractors’ works were perfectly plausible and in all probability represented the reality of the situation, particularly as no RISC forms were submitted by LCAL for the original SJ as was agreed between Leading Counsel for the CoI and Huyghe during the course of his cross-examination [T16/66:7-16]. Wall’s statement to the CoI’s Leading Counsel made during the course of his cross-examination that the defects in the SJ looked at in isolation were consistent with “*the level of defects to be expected*” and his subsequent answer to Government’s Leading Counsel that such defects were “*not unusual on a project of this scale*” [T17/135:5-137:1] calls into question the credibility of this part of his evidence as a PM expert.

57. Moving on to the matter of couplers that had not been exposed, Huyghe explained that such a problem should have been resolved by labourers chipping down into the concrete to locate the coupler, whilst making sure that the concrete that was chipped away did not fall down into the bottom

⁸² See also page 22 of Huyghe’s Presentation [ER(CoI2)1/Item 6.4/22].

of the pour because one would not want the concrete pour to be rejected on the basis that it was contaminated, and after which the concrete would be poured [T16/45:18-25]⁸³. Obviously, to the extent that there was any failure to expose and/or any damage to the couplers, these were aspects of defective workmanship on the part of LCAL and/or its subcontractors.

58. Huyghe finally dealt with the matters of missing couplers and incorrect coupler layouts, explaining that to resolve any such problems one would get a labourer to drill or core a hole and relocate the coupler, then hot epoxy grout it and install the rebar before pouring the concrete [T16/47:14-23]⁸⁴. Again, to the extent that there were any missing couplers or incorrect coupler layouts, these were aspects of defective workmanship on the part of LCAL and/or its subcontractors.

II(iii) Interface management

59. Huyghe explained his opinions in his evidence in-chief by reference to pages 24 and 25 of his Presentation. Specifically, he referred to Table Z2.1.2, “*Exchange of Design Information*”, from the Particular Specification which he had replicated on page 24 of the Presentation. So far as Huyghe was concerned, he explained that the Table laid out in a very good manner what needed to be done between the Contract 1111 contractor and the Contract 1112 contractor as well as the purpose of the interface and that the right-hand column identified the fact that there were couplers to look at and there was a Method Statement to prepare if there was an issue on the couplers [T16/50:13-51:3], albeit in paragraph 127 of his PM report dated 21 September 2019 he had pointed out that LCAL had not carried out its interfacing obligations as set out in the Table as it had not provided a specific Method Statement dealing with the SJ. As explained in paragraph

⁸³ See also page 20 of Huyghe’s Presentation [ER(CoI2)1/Item 6.4/20].

⁸⁴ See also page 21 of Huyghe’s Presentation [ER(CoI2)1/Item 6.4/21].

35 of Huyghe's Supplemental PM report, in the event that LCAL had prepared a specific Method Statement showing the interface requirements at the SJ and/or communicated with its frontline staff who were responsible for checking the joints, the mismatch of couplers/rebars could and should have been prevented.

60. The substance of Huyghe's latter opinion was ultimately something which Wall agreed with as is clear from the contents of paragraph 31 above. Not surprisingly, Huyghe told LCAL's Counsel during the course of his cross-examination that having a Method Statement that recognised that there was a difference in couplers "*that actually went to the field*" was more important from a PM and contract administration perspective than MTRCL asking Atkins to issue a drawing amendment to show that the couplers at the interface were different [T16/116:5-23]. In this context, when Wall was asked about the statement in paragraph 78(a) of his PM report that "*I am of the opinion that such lack of knowledge in the inspection teams for the stitch joints primarily stems from a lack of interface coordination, in particular with respect to the lack of adequate detail contained on the construction drawings*" by Leading Counsel for MTRCL, he confirmed that he was referring to the fact that the construction drawings did not specify the brand and type of coupler before stating categorically that he was not criticising the initial drawings for the LCAL contract i.e. Contract 1112 [T17/118:2- 123:13]. Of course, and whilst it is an obvious point to make, in the event that LCAL's personnel who had attended the Interface Meetings had passed the knowledge they had gained at such meetings concerning the use of different couplers at the Contracts 1111/1112 interface on to LCAL's field personnel and/or prepared and issued the requisite Method Statement for such interface the problem caused by the mis-match in couplers would never have occurred – but LCAL did neither.

61. Huyghe had also expressed the view in paragraph 34 of his Supplemental PM report that LCAL's failure to arrange a joint inspection with GKJV of the exposed couplers as required by item 1.7 of Table Z2.1.1 in Appendix Z2 of Particular Specification⁸⁵ prior to the SJ works being carried out revealed a further PM failure on its part, as such a joint inspection should have alerted LCAL to the use of Lenton couplers by GKJV. This opinion was well founded and not challenged in Huyghe's cross-examination.
62. In short, Huyghe's relevant opinions on interface management which he expressed as his evidence in-chief continued were that [T16/51:4-52:2]⁸⁶:
- (1) The PIMS provided good procedures to minimise safety risks (as Rowsell had also accepted in paragraph 80 of his PM report), but LCAL acknowledges a lack of communication on its part as it did not tell its frontline staff about the Lenton/BOSA coupler issue which had been discussed in the interface meetings and such frontline staff were unaware of the different couplers/SJ. This particular failing led Huyghe to opine in paragraph 128 of his PM report dated 21 September 2019 "*... that the procedures put in place by Leighton were inadequate for effective interface management since there was no reliable method to handle transmitting specific design information for each interface point*", an opinion which is not possible to gainsay;
 - (2) LCAL was responsible for the co-ordination, preparation and execution of the work and inspections (an opinion which Rowsell also held as evidenced by the terms of paragraph 82e of his PM report);

⁸⁵ [BB1/425].

⁸⁶ See also pages 24 & 25 of Huyghe's Presentation [ER(CoI2)1/Item 6.4/24-25].

- (3) Both LCAL's and MTRCL's staff needed training regarding couplers;
- (4) No Method Statement was provided by LCAL for the couplers which were to be installed;
- (5) LCAL's staff were unfamiliar with the QSP requirements for inspecting couplers and LCAL did not follow the record-keeping requirements under the QSP;
- (6) Inspections appear not to have been conducted; and
- (7) Defective work was covered up when concrete was poured.

II(iv) Improvements

63. The final part of Huyghe's evidence in-chief dealt with an update on MTRCL's management improvements to the end of September 2019 which he gave by reference to page 27 of his Presentation.
64. Huyghe gave his evidence to the CoI against a background where the CoI will undoubtedly recall that during the factual witness hearing MTRCL's Engineering Director, Peter Ewen ('Ewen'), had explained in considerable detail the improvements that MTRCL was in the process of implementing in terms of its management of the projects which it was involved in, and whereby *inter alia* MTRCL:
 - (1) was in the process of taking steps to improve its PM system;
 - (2) had decided to do a full and comprehensive review of PIMS and that external expertise would be used to assist with this task;
 - (3) was looking at how it could be a leader in the use of digital tools in project management;
 - (4) had put various taskforces in place and, under the PM organisation office, was constituting six projects with project initiation

documents, covering digitalisation, quality, governance, contracting, competence, and a PIMS review; and

- (5) had put a complete formal body around not just taking the recommendations forward, but was looking forward into the projects that were coming in the future to make sure that it was fit and ready for them when they came along⁸⁷.

65. The improvements referred to above were in addition to:

- (1) MTRCL engaging in July 2018 T&T, a leading management consultancy, to carry out a review to assist MTRCL in updating and improving its management systems⁸⁸;
- (2) the creation in November 2018 of a Special Taskforce to oversee the implementation of the steps and measures set out in T&T's Interim Report which was issued on 15 October 2018⁸⁹ and to undertake the following tasks and works⁹⁰:
 - (a) the establishment of a high level implementation programme for addressing T&T's recommendations;
 - (b) identifying and appointing individual owners to champion or support the implementation of T&T's recommendations;
 - (c) seeking the Executive's direction on strategic related recommendations prior to implementing detailed actions;
 - (d) provide guidance to drive action owners to ensure recommendations were appropriately addressed in a timely manner; and

⁸⁷ [T14/49:15-51:7].

⁸⁸ §§33 to 43 of the witness statement of Peter Ewen [BB8/5161-5164]; §40 of the witness statement of Frederick Ma Si-hang [B1/113]; §§49 to 50 of the witness statement of Lincoln Leong Kwok Kuen [B1/126].

⁸⁹ [B17/24421-24476].

⁹⁰ §38 of the witness statement of Peter Ewen [BB8/5162-5163].

- (e) The provision of regular progress updates to the Executive.

Further, to enhance co-ordination in the implementation of T&T's recommendations, Ewen explained that a cross-disciplinary Project Transformation Steering Group was being developed to oversee the works by the various groups which MTRCL had established to implement T&T's recommendations⁹¹, as well as the recommendations contained in the CoI's Interim Report.

66. It bears emphasis that the CoI was informed during the course of the factual witness hearing that MTRCL's on-going improvements to its management system were equally relevant to the PM issues in respect of the NAT, SAT, and HHS, which improvements included the following measures:
- (1) Digitalisation of the site inspection process and the adoption of BIM;
 - (2) Enhanced training of frontline staff for better implementation of PIMS;
 - (3) Enhancements to the quality assurance system; and
 - (4) Fundamental revision of PIMS.
67. Returning to Huyghe's update, he explained that [T16/51:3-53:11]:
- (1) iComm and iSuper had both been established within SCL construction contracts and were being used on a daily basis to enhance the digital management of quality matters, including the use of electronic systems for RISC forms;
 - (2) MTRCL has appointed a Quality Manager and now had a 'second line of defence' dealing with quality;
 - (3) The Engineering Division's Quality Assurance Team had increased in size to 10 staff members who were developing work flows for

⁹¹ §41 of the witness statement of Peter Ewen [BB8/5163].

‘second line of defence’ quality procedures, pulling together guidelines for staff competence evaluation and starting to perform verification and assurance duties across all SCL projects; and

- (4) BIM is being introduced for future projects and there were 3 new consultancies which had been awarded for designs that would adopt BIM and one detailed design contract adopting the NEC form of contract had already been tendered out.

Finally, Huyghe confirmed that a lot of the things that he and Rowsell talked about in their PM reports in terms of suggestions as to what MTRCL needed to do had also been incorporated in MTRCL’s implementation of improvement measures which he regarded as being a “*positive note*”.

68. At the very end of the recent hearing Commissioner Handsford usefully suggested that the CoI would find it helpful to be told what progress has been made in terms of implementing those recommendations made by T&T as well as those set out in its Interim Report⁹². Taking T&T’s recommendations first, MTRCL appends hereto a Table entitled “*T&T Recommendations with Actions Taken/To Be taken [Status as at January 2020]*”. The CoI will see that this is an updated version of Appendix II to Ewen’s witness statement, which previously recorded the situation that prevailed so far as the implementation of T&T’s recommendations were concerned as at 17 May 2019⁹³. Turning to the recommendations set out in the CoI’s Interim Report, MTRCL appends hereto a Table entitled “*Progress Update for CoI Recommendations Implementation by MTRCL*”. Both Tables are, it is submitted, self-explanatory and show the very considerable lengths and expense that MTRCL has gone to in just a

⁹² [T12/53:25-55:7]

⁹³ §40 of the witness statement of Peter Ewen [BB8/5163].

relatively short period of time to implement both T&T's and the CoI's recommendations.

69. Having dealt above with four important areas so far as the PM of the Project is concerned by reference to the relevant evidence pertaining thereto, MTRCL now deals with a number of further matters which were raised in the PM experts' evidence before the CoI.

II(v) Rebar testing

70. The Joint Statement sets out the nature and extent of all three PM experts' agreement concerning the testing of reinforcement steel in paragraphs 38 to 42. Huyghe was questioned about this topic by Leading Counsel for the CoI [T16/80:22-83:11]. He explained that a project with a 93% success rate was not a bad per cent success rate, so he had not really given much more thought to rebar inspection because he thought that it "*was a pretty good result*" and "*a good acceptance rate*", but that the proposals set out in paragraph 42 of the Joint Statement would hopefully give MTRCL a procedure by which it could also monitor and audit the testing of rebar. In answer to Government's Leading Counsel's questions on this topic, he explained that his view that the 93% pass rate should give a good degree of confidence that reinforcing steel met the required standards was, importantly, based upon his experience in actually building projects and having steel checked and from a "*construction perspective*" and even though he did not know the locations in which the untested 7% was fixed [T16/121:11-22].

71. Rowsell was asked about the steel testing percentage success rate by Leading Counsel for the CoI and explained that he had "*come to the conclusion, which my fellow project management experts agree with, that based on practices elsewhere, where there is a much lower level of purchaser testing, a testing level of 93 per cent, with successful test results*

and with the availability of mill certificates for the steel that's being supplied, should give a good degree of confidence” [T18/16:21-17:2].

72. Whilst it is unfortunate that 7% of the steel was not HOKLAS tested by LCAL in accordance with its contractual obligations, there is no need whatsoever to doubt the safety and fitness for purpose of the structures in question having regard to the structural engineering expert evidence which is referred to in Section I herein, but that the implementation of the measures referred to in paragraph 42 of the Joint Statement ought to prevent any re-occurrence of such event.

II(vi) Availability of latest drawings

73. This issue arose out of a concern expressed in paragraph 57 of Rowsell’s PM report to the effect that only MTRCL’s ConE had access to the latest drawings as well as the fact that not all of the inspection team had access to the most up-to date drawings, which concern Huyghe had disputed for the reasons set out in paragraph 119 of his PM report dated 21 September 2019. This was an issue which Leading Counsel for the CoI discussed with Huyghe [T16/83:12 – 85:16] and whereupon it became clear that whilst the matter was essentially one of fact, the implementation of those measures set out in paragraph 27d of the Joint Statement as well as iSuper and iComm and the various electronic technologies that MTRCL was in the process of implementing would rectify insofar as any deficiency of the kind under consideration existed.
74. That said, MTRCL does submit that Rowsell’s concern was misconceived as became clear when he was cross-examined on the matter by Leading Counsel for MTRCL⁹⁴. The CoI’s Leading Counsel’s attempt to resurrect the justification for Rowsell’s ‘concern’ by reference to the evidence of

⁹⁴ [T18/122:18-131:3].

MTRCL's Tony Tang failed [T18/144:8-146:12] because as MTRCL's Leading Counsel made clear in an intervention at the end of Huyghe's cross-examination, Tony Tang's statement made it clear that he was not responsible for the rebar inspection and thus did not have access to the requisite drawings to check the rebar installation details – which was not surprising if it was not his responsibility to check the rebar installation details [T18/146:16-147:4]. Notwithstanding, and particularly having regard to the implementation of those measures which are referred to in paragraph 72 above, it is no longer one of the most pressing points for the CoI to consider.

II(vii) Supervision

75. During the course of the PM expert evidence hearing it became apparent that LCAL was intent on seeking to address the CoI on and re-open and re-run its previous arguments concerning the concept of “*full-time and continuous supervision*”, notwithstanding the fact that the CoI had dealt extensively with the meaning of the phrase in its Interim Report, and such fact led to an expression of concern from Leading Counsel for the CoI [T17/1:5-3:10]. Of necessity, MTRCL must reserve its position on this matter until it has had an opportunity to consider and digest LCAL's closing submissions on this matter, but in the meantime makes the following brief observations on the expert PM evidence which was placed before the CoI and which is of potential relevance to any further consideration of the matter that the CoI is prepared to contemplate.
76. Huyghe gave evidence first and was asked various questions by LCAL's Leading Counsel about the supervision of the works [T16/111:16-116:3]. In summary, his evidence was as follows:
- (1) The phrase “*full-time and continuous supervision*” did not mean ‘man-marking’ or that the supervisor had to be present 100% of the

time when the work was being done;

- (2) By reference to the General Specification, his view was that the minimum requirement was 1 supervisor to no more than 10 workers;
- (3) It did not matter that the ratio of 1 supervisor to no more than 10 workers came from a clause found in a part of the General Specification concerning Health and Safety;
- (4) Having regard to the QSP, the requirement of “*full-time and continuous supervision*” and record keeping and the like applied only to areas which were subject to a requirement of ductility, although he considered this to be a non-issue as LCAL used the ductile couplers when they probably could have got by with a non-ductile coupler; and
- (5) One went by the drawings to determine where the ductile requirement was, although all the work needed to be supervised whether or not the couplers were ductile.

In answer to questioning by Leading Counsel for Government, Huyghe explained by reference to paragraph 52 of Rowsell’s report where Rowsell set out his opinions on the contributory causes of the non-identification of defects during inspection that LCAL failed to provide full-time supervision of the coupler works [T16/118:12-119:4].

77. Wall was questioned by MTRCL’s Leading Counsel in relation to paragraph 73 of his PM report where he had highlighted the fact that clause G3.9.1 of the General Specification dealing with the ratio of 1 supervisor to no more than 10 workers related to health and safety and not quality assurance matters. However, he nevertheless accepted that LCAL still had to comply with it⁹⁵. As Huyghe had already made clear in his evidence, it

⁹⁵ [T17/116:8-117:25].

was a non-point and that the part of the General Specification in question still applied to the coupler installations.

78. Wall also told Government's Leading Counsel during the course of his questioning that by reference to paragraph 15 of his PM report he disagreed with Rowsell's interpretation of "*full-time and continuous supervision*", that the obligation to provide full-time and continuous supervision applied only to couplers which were the subject of a ductility requirement and that there was a difference in the supervision requirement for couplers that were specified as ductile and those that were not specified as ductile [T17/132:6-23]. However, Wall was then referred to the evidence which LCAL's Mr. Holden had previously given to the CoI, which Wall said he could not recall whether he had seen, and told Counsel that he agreed with what Mr. Holden had said about the need for full-time supervision on non-ductile couplers i.e. there was still a requirement that the contractor would need to provide full-time supervision [T17/132:24-134:15].
79. Finally, Rowsell also gave evidence on the issue of site supervision during the course of a lengthy discussion on the matter with Counsel for LCAL which included helpful interventions from both the Chairman and Professor Hansford on the topic [T18/35:12-65:7]. The principal points made by Rowsell during the course of his evidence are summarised below:
- (1) By reference to paragraph 78 of his first PM report which he had served for the CoI's assistance in the Original Inquiry, that "*full-time and continuous supervision*" meant "*that a contractor's supervisor needs to be present at all times where mechanical coupler are underway*", although it would not necessarily be the same supervisor who was present all the time and the reference for this

was paragraph (5)1(i) of the QSP⁹⁶;

- (2) He did not accept LCAL's position that the QSP was only applicable to areas where there was a ductility requirement for the couplers so that where there was an area where there was no ductility requirement the provision under the QSP referring to "*full-time and continuous supervision*" was not applicable because:
 - (a) the requirement flowed from the BD HKCoP and also the letters of acceptance which the BD sent in response to the design consultation process in 2013, which letters covered situations where there were couplers with ductility requirements and situations where there were couplers without ductility requirements;
 - (b) for the situation where there were ductile couplers, the QSPs required full-time and continuous supervision, but where there were couplers without ductility requirements there was still a need for full-time supervision;
 - (c) 'Full-time' and 'continuous' supervision were pretty much the same thing, and his view as a PM expert was that "*Full-time*" could be taken to be the full-time presence on site, whereas "*continuous*" was indicative of the fact that the supervisors or inspectors should be dedicated to a supervision role, but it did not mean 'man-marking', although as was explained to the Chairman there would probably be two or three people the supervisor was paying particular attention to so as to ensure they were doing the work correctly and not coming up against any problems;

⁹⁶ [B6/4103].

- (d) The General Specification set a requirement of a minimum of one supervisor for every ten workers, so “*it’s one on ten*”, and in a working area one supervisor can probably quite easily see generally what those people are doing in terms of working in a safe manner and generally following the quality and technical procedures and the supervisor should have enough experience to see whether work is generally being done right and if one got to a critical stage one would expect the supervisor to pay particularly close attention to what is being undertaken and to step in as necessary to give any advice on how the work should be done;
- (e) The ‘continuous presence’ of the supervisors would probably allow the supervisors to go off and have a ‘toilet break’ every now and then without contravening that requirement, but if they went off on two weeks’ holiday then one would expect somebody to be there to cover them, and the presence should be in the work area so that they can see what the workers are doing as opposed to sitting in the office which was not supervising;
- (f) The requirement for “*full-time and continuous supervision*” applied to areas of high risk where there was deemed to be a need for a QSP and that applied only to small areas of the work where Government wanted to be sure that the works in such areas were built properly and properly supervised;
- (g) There should be flexibility to ensure that there’s enough supervision to make sure that the job is done right and safely and doesn’t have to be done again which is where one runs into abortive costs and inefficient working;

- (h) To get to a hold-point inspection the contractor should have satisfied itself that the works have been properly done in accordance with the contract and the person signing the form signs to that effect, i.e. the works are ready for inspection and in accordance with the contract, and the contractor should not be notifying that the works are ready for inspection knowing that there are still defects, and the supervisor should be ensuring that the works are carried out in such a way that when they are presented for inspection, they pass the inspection which is why the specification requires full-time supervision by the contractor and 20% surveillance by MTRCL which is a line of assurance;
- (i) If you do not have proper supervision by the contractor and proper surveillance by MTRCL there is far more reliance placed on the hold-point inspection, because the hold-point inspection is the 'last line of defence' and one would have to allow significantly longer to make sure that one could access all the couplers as part of the inspection, even those in the bottom mats, and if they could not be accessed they would have to be taken apart so that the couplers could be inspected, which was a very difficult task;
- (j) In terms of the level of supervision and surveillance, it is clearly the intention that superintendence is there to make sure that the work is done safely and in accordance with the contract, so that if the supervisors are doing their job, when there is a requirement for a formal inspection, by the inspectors who might also happen to be people who are undertaking surveillance, they can sign off the work if it has

been done in accordance with the contract;

- (k) Looking into the future and from a PM point of view, if “*supervision*” or “*full-time and continuous supervision*” means the supervisors need to be satisfied that the finished product will pass a hold-point inspection, this should be made clear in the BD consultation letters or the QSP, which is what Rowsell has recommended in his first PM report;
- (l) Clause G3.9.1 of the General Specification⁹⁷ from which the one-to-ten ratio derives is in the Section dealing with “*Health and Safety*”, but it applied to all work under the contract and was quite clearly about site supervision and it was included where it was because one of the aspects of supervision is to ensure that all the works on site are carried out safely, although it relates to site supervision across the works and it is stated “*The Contractor shall provide adequate supervision to ensure that all works on Site are carried out safely*”, but if there was any doubt about it on future contracts it could be located somewhere else;
- (m) It was helpful to have the level of supervision that was expected set out in the General Specification so that when the tenderers were bidding for the work they could see the level of resource that they will be required to provide during the course of the contract and it put all the tenderers on a “level playing field” in terms of the resource provision which they allow;
- (n) A TCP-3 level supervisor was required under the one-to-ten

⁹⁷ [C3/2040].

ratio i.e. for 10 rebar fixers, but he did not accept Wall's contention that from a practical, PM point of view one would need two to three times more supervisors, as one would need only slightly more supervisors to have the one-to-ten ratio, say 13 or 14 supervisors rather than 10 if one had 100 workers, but the TCP-3 requirement only applied where there was a QSP in place which was only on relatively limited parts of the site and where full-time supervision was required under the BD's letters of acceptance but there was no QSP, so only a T1 supervisor was required; and

- (o) To implement the necessity for 13 or 14 supervisors rather than 10 if one had 100 workers would significantly increase the cost, but that should have been allowed for in the tender price.

80. Insofar as any differences existed between Huyghe and Rowsell on the one hand, and Wall on the other, regarding the evidence on supervision, it is submitted that the CoI should prefer the evidence from the former, in particular its own expert Rowsell, to that of Wall. However, as to the precise assistance that the CoI will derive from such evidence so far as the content of its Final Report is concerned, MTRCL repeats the point made in paragraph 75 above that it reserves its position until it has had an opportunity to consider and digest LCAL's closing submissions on this matter, specifically as to the way in which the CoI's decisions and recommendation on supervision and, in particular, the meaning of the phrase "*full-time and continuous supervision*" should be revised and/or elaborated upon.

III. Conclusion

81. By way of a conclusion to this PM section of its closing submissions, MTRCL takes this opportunity to remind the CoI that it is common ground between Rowsell and Huyghe that there is no PM system in existence that can avoid any and all mistakes during the construction process:

“It is common that some mistakes or oversights will inevitably be made in the performance of the works of such scale and complexity. However, procedures should be in place to mitigate errors and enable the works to be executed in a professional manner.”⁹⁸

That said, insofar as avoidable PM errors occurred for which it might be said that MTRCL has a responsibility, McQuillan, Glover and Southward agree that they did not render the structures under consideration unsafe and, moreover, it is submitted that MTRCL should receive the recognition it deserves for taking the necessary steps to implement all those measures which are referred to above to either mitigate or avoid completely PM errors and failings of the kind which occurred on the Project. MTRCL welcomes and looks forward to receiving the recommendations which the CoI sees fit to make in its Final Report and takes this opportunity to reiterate and emphasise that its top priority is public safety, an objective that it will do its absolute utmost to achieve and, in the context of the Hung Hom Station *has* achieved.

Dated 17 January 2020

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Jonathan Wong
Kaiser Leung
Counsel for MTRCL**

⁹⁸ §5 of the Joint Statement of PM experts [ER1/Item 9/T-1]; §§21 to 22 of the witness statement of Peter Ewen [BB8/5158-5159].

T&T Recommendations
with Actions Taken / To Be taken
[Status as at January 2020]

Code No.	T&T Recommendations	Action Taken / To Be Taken
PP1	The 'Project Integrated Management Policy' (PIMS/MAN/001/A4) to be re-written to make Quality Policy clear and succinct. This new Project Integrated Management Policy to be signed by the Board to underpin commitment to management principles and behaviours.	<ul style="list-style-type: none"> The Project Integration Management Policy has been revised and issued by MTRCL Executive with clear commitment to quality management added
PP2	PIMS requires simplifying in regards to Project Quality Management to allow access and ease of use for all MTRCL employees and to provide a 'Golden Thread of Quality from Board to Site'.	<ul style="list-style-type: none"> A quick reference guide for staff on PIMS documentation has been issued for reference by all staff
PP3	A specific Project Quality Management Plan document to be written to act as a guide to the quality expectations within PIMS.	<ul style="list-style-type: none"> A Quality Management Plan for SCL has been endorsed by the Project Director and issued by MTRCL Executive
PP4	Simplified guidance and flow charts in English & Chinese for onsite monitoring procedures and the proposed new NCR procedure. Digital forms to be in both English & Chinese.	<ul style="list-style-type: none"> NCR categorisations have been redefined and NCR reporting procedure has been amended and implemented on SCL Contracts Translation of essential workflows in PIMS into Chinese has been carried out and the most frequently used procedures and workflows have been issued.
PP5	Introduce yearly review of PIMS by the review panel and capture feedback from those on site regularly to drive 'bottom up' improvements.	<ul style="list-style-type: none"> Survey of staff on PIMS usage has been carried out with the findings being used to support an initiative to revamp the existing PIMS An internal MTRCL PIMS review panel has been formed and is continuously updating the current PIMS An Independent External Consultant has been appointed to carry out the review and revisions. The PIMS documentation structure is being modified to be more easily implemented based on activity flow charts, clearer guidance on responsibilities and a whole lifecycle structure. The Consultancy commenced in October 2019 and will be completed in Q4 2020

Code No.	T&T Recommendations	Action Taken / To Be Taken
PP6	Inspection records to be captured digitally (including photographic records) and held centrally by a reporting team independent of the delivery team to allow analysis of inspections and positive reporting.	<ul style="list-style-type: none"> • Contracts awarded for new digital reporting and supervision system to cover on-site communication, workflow and supervision, including RISC and NCR processes. • A new digital reporting and supervision system to cover on-site communication has been introduced to the main SCL North South Line Contracts. • An on-site digital system for managing workflows and sign-off of RISC and NCRs has been introduced on all SCL major Contracts • Both systems are being continually upgraded to enhance performance based on site feedback
PP7	Reporting to be expanded to capture other quality and conformity issues such as requests for information, design change requests, and field change requests. Other positive reporting to be implemented such as Requests for Inspection planned vs held, audits planned vs held, 'hold points' planned vs passed.	<ul style="list-style-type: none"> • The new digital supervision and reporting system noted in PP6 now includes dashboard reporting facilities which capture KPIs for monitoring of quality on site. A lookahead system to record planned v actual inspections of hold points has been introduced on site
PP8	NCRs to be re-categorised to capture lower less 'significant' defects.	<ul style="list-style-type: none"> • NCR categorisations have been redefined and are now being used on SCL Contracts. They are also being incorporated into digital reporting and monitoring workflows
PP9	If the rework needs tracking - it is an NCR.	<ul style="list-style-type: none"> • Same action as PP8
PP10	There is to be one central NCR database, managed by MTRCL (to include MTRCL, Form B, and contractor NCRs)	<ul style="list-style-type: none"> • Digital infrastructure for central control of an NCR database is under development. A manually administered central data base for NCRs and Form Bs, including those from contractors, has now been established. Manual database for MTR raised NCR now live. A database of NCRs raised by contractors has been established and is monitored by MTRCL
PP11	All contractors and sub-contractors to have access to the NCR database and empowered to raise NCRs.	<ul style="list-style-type: none"> • System referred to in PP10 is accessible at appropriate contractor levels to suit the work being undertaken (with confidentiality restrictions as necessary still under consideration)

Code No.	T&T Recommendations	Action Taken / To Be Taken
PP12	This database to be maintained centrally and independently of the delivery team to maintain governance and traceability.	<ul style="list-style-type: none"> System referred to in PP10 is being managed by the PMO to provide independence from Site Project Management Team. It is intended that that management will be transferred to Engineering Quality Division in due course
PP13	MTRCL to be the party to close out the NCR once the contractor has provided sufficient evidence for its satisfactory completion.	<ul style="list-style-type: none"> System referred to in PP6 allows MTRCL an oversight on all NCRs to ensure NCRs raised by contractors are being adequately addressed
PP14	Positive reporting of site checks and routine observations by digitalised site diaries	<ul style="list-style-type: none"> Digital diary has been introduced in SCL Contracts
OR1	Strengthen the quality assurance role - increase the number of staff responsible for project quality assurance, and re-train others, i.e. providing confidence that the contractor will continue to deliver the defined quality standards by reviewing and monitoring their processes, staff capability and methodology	<ul style="list-style-type: none"> A new quality management team reporting to the Engineering Director to enhance quality performance by providing an independent "second line of defence" is now in place The new Quality Manger reported for duty in May 2019 and has built up a team of 10 staff throughout 2019. The Engineering Division QA team will increase resources for future Projects as required MTRCL Executive has approved the re-organisation of the Corporatwide Quality Management Team under a three tier control structure, with Project Division providing the first tier, with Engineering Division providing the "Second Line of Defence" and a "Third Line of Defence" comprising the quality process being provided by way of the Internal Audit Department reporting to the Board
OR2	Those members of the MTRCL delivery team who have specific duties for quality and safety under the terms of the Code of Practice for Site Supervision 2009 (CoP) should have a formal and independent reporting line as a fundamental part of the Quality System	<ul style="list-style-type: none"> Independent QA team under the control of Engineering Division has been developed as referred to in OR1
OR3	Quality to have representation and reporting independently at Board level to those responsible for delivery to introduce strong 'checks & balances' strengthening the governance and confidence in the delivery team.	<ul style="list-style-type: none"> Same action as OR2

Code No.	T&T Recommendations	Action Taken / To Be Taken
CC1	Strategic review on major programme and organisation set up for the delivery of large-scale projects. Set up of a fully resourced project organisation, supported by a Project Management Office (PMO), with clear line of accountability to deliver large and complex infrastructure projects such as SCL.	<ul style="list-style-type: none"> • Long term action to be addressed prior to future Projects commencing as part of a more rigorous 'lessons learned' review from the past 5 Projects. The next major construction contract will not start until 2021 at the earliest. As an intermediate step the existing PMO resources are being increased to enhance quality management
CC2	Consider negotiating a larger cap on the employer's financial exposure with the Government. Also to introduce "final target cost" instead of the "initial target cost", which includes the effect of price adjustment for employer's change/risk, as the reference point for pain/gain share.	<ul style="list-style-type: none"> • Review of contract commercial management issues will be carried out prior to future Projects commencing – long term action. A Contracts & Procurement Review Committee has been set up to identify any possible improvements required for future Contract strategy and Documentation
CC3	Consider further investigations into the use of other collaborative forms of contract (e.g. NEC contracts) which drive proactive project management and best practices with an independent 'Supervisor' focusing only on quality.	<ul style="list-style-type: none"> • Same action as CC2 • The Review Committee referred to in CC2 is also reviewing current forms of contract adopted in MTRCL's projects and will make recommendations for improvement, particularly with respect to collaborative forms of contracting • The NEC4 form of contract is being trialed on SCL Contract C11081. The tendering process for contract award has now commenced and has adopted the NEC PSC Option A form of contract
CC4	A set of quality KPIs are recorded and trend-analysed which form the basis of any quality incentivisation scheme and allow quality performance to be systematically fed back to subsequent procurement process.	<ul style="list-style-type: none"> • See comment against PP7. KPI reporting and trend analysis will be part of the new system being introduced. • The initial set of quality KPIs relating to RISC Sheets for inspection of works on site has been developed and is being used in dashboard reporting on major SCL Construction Contracts.
CC5	Introduce a provision which requires the contractor to notify all NCRs, including that of his supply chain, before the employer's team does and incentivises the contractor to do so.	<ul style="list-style-type: none"> • New NCR process and workflows have been introduced– see comments against PP6, PP10 & PP13
CC6	Where quality KPIs are available, it is recommended to incentivise the contractors by rewarding the contractors who achieve a high quality score and/or sits at the top of quality KPI table amongst other contracts under the same portfolio of projects	<ul style="list-style-type: none"> • Incentivisation scheme is being considered for future Projects (see comments in CC2 and CC3)

Code No.	T&T Recommendations	Action Taken / To Be Taken
		<ul style="list-style-type: none"> No change to existing contracts being considered, as any change to commercial aspect of existing contracts would require Government's approval
CC7	Consider introducing provisions which require the contractor to include requirements to strengthen quality performance in any sub-contracts, such as; <ul style="list-style-type: none"> - to use the MTRCL NCR central register and to do so will require a web-based digitalised system; - Incentivisation scheme at sub-contract level for quality performance with clear KPIs; - use of collaborative form of contract; and - capturing cost of rework. 	<ul style="list-style-type: none"> Long term action for review on future contracts Changes to existing sub-contracting processes considered not feasible for live SCL Contracts but is being considered for future Contracts
CC8	Review of the P&CD process and procedure and create stronger links referenced in PIMS in order to strengthen the focus of quality management and the link between quality and commercial management throughout the project life cycle.	<ul style="list-style-type: none"> Long term action for future Projects The independent consultancy referred to in PP5 includes a review of how the revised PIMS interface better with the P&CD procedure with a full project lifecycle approach to PIMS
PC1	Introduce specific training for quality management starting with the existing training available for 'Self Audits'	<ul style="list-style-type: none"> New enhanced training has been introduced for site supervision teams which includes training for staff with statutory responsibilities under the Quality Supervision Plans and Site Supervision Plans Retraining of staff qualified to carry out Self Audits has been carried out A register is now in place to record training attended by site supervision staff to ensure training matches duties being performed on site
PC2	Re-skill and re-assign SLOW/IOW/CEs with QA focus to support CoP	<ul style="list-style-type: none"> New enhanced training has commenced for site supervision teams. (see PC1) A 2020 lookahead on site staff training needs specific to the works activities across live contracts against PIMS supervision roles has been carried out. Enhanced training to match roles and responsibilities with works activities was carried out throughout 2019 and has commenced for 2020
PC3	Raise the profile of the quality manager as a professional with specific training and potentially look at chartership programme	<ul style="list-style-type: none"> A new senior management position to lead the Engineering Division's Quality Section has been established and the

Code No.	T&T Recommendations	Action Taken / To Be Taken
		<p>new Quality Manger is now in place. Strict professional qualification standards have been observed when recruiting staff to the new section. External training for staff to obtain auditing accreditation is also being provided</p>
PC4	<p>Site competence: define levels of competency required, monitor and report</p> <ul style="list-style-type: none"> - Establish competency matrix to address requirements in the CoP - Conduct competency assessment for all applicable project staff - Provide training to bridge competency gap as required 	<ul style="list-style-type: none"> • Matrix developed for levels of individual staff competence as required by the CoP • Competency assessment of staff performing SSP sign off duties on SCL Contracts has been carried out and found to be adequate. Training as required for remaining SCL site staff has been carried out • A Competency Working Group has been established to develop procedures and proformas to evaluate all staff's competences for the roles they carry out. A competency review procedure has been drafted and will be developed further. Competency reviews of staff have commenced
PC5	<p>Mandatory quality training on induction (supported by new quality management plan)</p>	<ul style="list-style-type: none"> • Mandatory E-training for existing and new staff is now in place
PC6	<p>Site quality alerts and toolbox talks – communicate and share knowledge regarding high impact or recurring NCRs.</p>	<ul style="list-style-type: none"> • A Quality Alert System has been introduced by Projects Division on SCL Contracts.
PC7	<p>Leadership & Behaviours: Re-prioritise quality – 'Build it right, build it safe'</p>	<ul style="list-style-type: none"> • Briefing given to all staff by Divisional GM – Projects
QP1	<p>Implement BIM strategy to capture asset data – it is recommended to plan what level of quality related certification is required and verify its integrity</p>	<ul style="list-style-type: none"> • Common Data Environment ('CDE') for BIM went 'live' in December 2018 and will be used as a data management tool in future Projects • The first application of the new CDE will be on SCL Contract C11081 and will include data capture. This contract will be awarded in Q2 2020 and is currently out to tenders • MTRCL Executive has endorsed the strategy that all future design and construction projects managed by Project and Engineering Departments will be carried out using BIM

Code No.	T&T Recommendations	Action Taken / To Be Taken
QP2	Readiness reviews – forward planning meetings and readiness approaching critical/hold points to be established as 'business as usual' for construction management team.	<ul style="list-style-type: none"> • 2-month rolling activities, including hold points, introduced into agendas for regular CM and SConE site meetings
QP3	ITPs to be more specific about what the contractor will be checking and how. MTRCL role is to check that it is being done and that correct releases of design are referred to, all RFIs are cross referenced, and that the ITP includes any field change requests	<ul style="list-style-type: none"> • Ongoing action for site training and development of digital management systems • Design verification hold points now introduced into RISC forms on site • RISC Forms have been redesigned to introduce an additional hold point for Design Management staff to verify that the works are being installed using the latest revised design data • The PIMS for site monitoring and supervision has been amended to specify hold point activities for approval to proceed by MTRCL staff • The PIMS has also been amended to clearly identify accountability and responsibility levels of site staff with respect to ITP review and hold point approval
QP4	Application of schedule as a tool – include hold points and quality control points in a Work Breakdown Structure (WBS) and 'set-up' template. The MTRCL schedule to show MTRCL interface points and include audit calendar as key dates on the schedule, audits on MTRCL team, self-audits and contractor audits	<ul style="list-style-type: none"> • Ongoing action
TT1	Introduce digitalised data capture of NCR, RISC, Field Change Requests etc. with asset data aligned to BIM strategy.	<ul style="list-style-type: none"> • Digital data capture systems have been introduced – see PP6 • Systems were chosen based on their vendors' confirmation that they will be capable of being further developed to link with BIM strategy for future Projects.
TT2	Short term data capture solutions to support long term strategy	<ul style="list-style-type: none"> • Same action as TT1

Progress Update for CoI Recommendations Implementation by MTRCL

[Status as at January 2020]

	Recommendation	Follow-up Actions Being Taken	CoI Ref¹
1. Promoting Public Safety			
1.1	<u>On-going monitoring of station structure</u>		460
	- Instrumentation, by means of fibre optics or other approved measures, at the east and west diaphragm walls and the East West Line and North South Line platform slabs to detect movement during operational phase of the station, and movements should be monitored and reported to the Government.	Evidence concerning alternative proposals involving visual monitoring has been placed before the Commission in CoI Stage 2 and awaits the Commission's consideration.	(391)
2. Leadership, Competence and Governance			
2.1	<u>Leadership</u>		-
2.1.1	- Closer involvement of senior leaders of all parties - Government, MTRCL and contractors - working collaboratively to achieve a quality outcome, involving senior leaders being more visible to the workforce and taking a lead role in communicating key messages throughout their respective organisations.	<ul style="list-style-type: none"> • SCL Steering Group on communications involving Executive and Senior Management of MTRCL and Government has been set up • A first Senior Leadership forum between MTRCL / Government / contractors has been held with the following objectives <ul style="list-style-type: none"> - Developing and aligning consistent and disciplined 	471 F-1

¹ Paragraph reference in the redacted Interim Report; F-X denotes paragraph reference in Annexure F.

	Recommendation	Follow-up Actions Being Taken	CoI Ref¹
		<p>communication strategies</p> <ul style="list-style-type: none"> - Fostering a collaborative working relationship at all levels - Building a working culture that supports constructive challenges <ul style="list-style-type: none"> • PSC Meeting Agenda has been reviewed and enhanced to encourage greater transparency between all stakeholders and early reporting of issues to Government 	
2.1.2	- Leadership roles should be developed in line with the principles set out in ISO9001:2015.	<ul style="list-style-type: none"> • As the overarching document of the ISO9001 compliant PIMS (Projects Integrated Management System), the PIMS Policy has been updated, signed by the current CEO of MTRCL and published since May 2019. The new Policy defines better project management principles and articulates expected behaviours of staff involved in managing railway projects. • The word "quality" is now adopted and prominently used in the latest updated PIMS Policy, further reinforcing MTRCL's focused attention to "quality", in addition to "safety" and the "environment". • An External Consultant has been appointed to carry out a full review and update of the PIMS documents with the emphasis on clarifying roles and responsibilities (including Leadership), such that these are consistently and clearly defined and embedded across all documents, with the use of a standard 'RACI' (Responsibility, Accountability, Consulted, Informed) model being implemented. 	F-1

	Recommendation	Follow-up Actions Being Taken	CoI Ref¹
2.1.3	- Establish a cross-party Senior Leadership Forum comprising the Government, MTRCL, contractors and major sub-contractors to monitor working relationships and cultural aspects of service delivery and to agree ways of developing collaborative working.	See item 2.1.1 bullet 2	F-2 (455)
2.2	<u>Competence</u>		-
2.2.1	- Review the “Competence” requirements for personnel engaged in project management/sponsorship roles and review checks and procedures to ensure ongoing competence of project-related staff.	<ul style="list-style-type: none"> • MTRCL have established a Transformation Board to carry out a comprehensive review and update of current management procedures and processes to be adopted in Project Delivery. Six Working Groups have been formed to drive improvements, one of which is dedicated to the development of Competency Management Processes. • A Competency Management Procedure is currently under development by the Working Group to develop a framework of requirements for all key roles across supervisory staff for all principles 	473
2.2.2	- Put in place effective measures to reduce the risk of failure by mistake, incompetence or malicious act.	<ul style="list-style-type: none"> • Quality Department has introduced a Quality Site Alert System to identify developing problems on site and notify other Contracts to be on the lookout for similar issues • A ‘Second Line of Defence’ has been introduced on site to provide independent monitoring and verification of the works 	474
3. Looking to a More Collaborative Culture			

	Recommendation	Follow-up Actions Being Taken	CoI Ref¹
3.1	<u>Fostering integrated working arrangement</u>		-
3.1.1	- Consider options for working arrangement in which Government staff could be integrated within MTRCL teams on a regular basis to help ensure a common understanding of requirements, improve communications, undertake joint forward planning and to resolve issues more efficiently.	To promote communication and collaborative working, RDO engineers and inspectors have been co-located at MTRCL NSL site offices since Q3/2019. Monthly site visits by RDO engineers are also held which are followed-up with office discussions with the MTRCL project team on areas of concern and priority issues.	F-9
	- Review options for more integrated and co-located working between the parties to achieve greater transparency of issues, better forward planning and joint risk management.	Ditto	F-45
3.1.2	- Create more collaborative culture between the Government, MTRCL and contractors with the objective of achieving more successful project outcomes, e.g. Closer working relationship between BD and MTRCL and its designers and contractors to facilitate dialogue in all engineering matters.	<ul style="list-style-type: none"> • See item 3.1.1 • MTRCL/BD meeting format has been amended to promote more collaborative working with respect to BD Submissions 	451- 452
3.2.	<u>Introducing New Engineering Contract (“NEC”)</u>		F-44
	- Introduce standard use of an industry standard collaborative form of contract such as NEC4.	<ul style="list-style-type: none"> • NEC4 will be adopted in the next two major contracts to be awarded: <ul style="list-style-type: none"> - Ma Chai Hang Recreation Ground Detailed Design 	(454)

	Recommendation	Follow-up Actions Being Taken	CoI Ref¹
		<ul style="list-style-type: none"> - Tung Chung Line Extension Preliminary Design • Further use of NEC Contracting is also being actively considered 	
3.3	<p><u>Adopting Building Information Modelling (“BIM”) as a collaboration tool</u></p> <ul style="list-style-type: none"> - Develop, implement and promote the use of BIM as a collaboration tool. 	<ul style="list-style-type: none"> • MTRCL has now set up a Common Data Environment to facilitate the future design and data management on site using BIM. Training on how to use this Common Data Environment has commenced • All designs/construction/approval/certification data as well as method statements and ITPs will be linked to the BIM model to ensure that there is one single source of truth • Executive has endorsed the decision that all future Projects will be fully designed and managed from the Preliminary Design Stage onwards using BIM. The required documentation to enforce is being prepared • The next 2 design consultancies to be awarded by MTRCL in Q2 2020 have been prepared with contract documents that mandate the use of BIM 	<p>469</p> <p>F-46</p> <p>(428-434)</p> <p>(437)</p> <p>(454)</p>
3.4	<u>MTRCL’s internal organisation</u>		-
3.4.1	<ul style="list-style-type: none"> - Consider ways of inducing closer working between different groups within the project organisation to avoid the risk of silo-working in which information and knowledge is not shared. Consider the effectiveness of existing 	<ul style="list-style-type: none"> • iShare has developed as a web-based knowledge and information management portal for managing documents, information and other functions for internal knowledge sharing and collaboration purposes. It is accessible to all MTRCL staff across contracts and contractors. 	F-3

	Recommendation	Follow-up Actions Being Taken	CoI Ref¹
	communication arrangements between the teams and throughout the organisation. Review information databases and systems to ensure a single accessible source of true position accessible as appropriate to all people.	<ul style="list-style-type: none"> • PIMS are being updated as referenced in item 2.1.2 • Dashboard reporting has been introduced to keep all parties better informed on developing issues • RISC Sheet format has been redeveloped to be inclusive of all relevant parties for review and sign off digitally • RISC, RFI, Site Discussions and Quality Observations are all now digitised for ease of access to relevant parties 	
3.4.2	- Review and clarify MTRCL roles and responsibilities in relation to the provisions and requirements of the Conditions of Contract. In particular, ensure that the position of Engineer to the Contract is understood and that roles and responsibilities respect the need for the Engineer to act impartially in the administration of the contract. The role of the Engineer needs to be integrated and compatible with the roles of others in MTRCL who have responsibilities for delivering obligations under the Entrustment Agreements (“EAs”).	<ul style="list-style-type: none"> • As part of the Transformation Initiative mentioned in item 2.2.1, a Working Group on Commercial & Contract Procedure has been set up and MTRCL’s Projects Division is looking at the various forms of contract to be adopted by MTRCL in the future • The role of the Engineer in future Projects will be transferred to the Engineering Division to give a greater degree of independence 	F-4
3.4.3	- Review arrangements for managing relationships with stakeholders to ensure that there is clarity on responsibilities and clear lines of communications particularly with Government Departments, and set out	<ul style="list-style-type: none"> • See item 2.1.1 • As part of the review of PIMS referred to above, a framework is being developed for a Stakeholder Management Plan which will be introduced in future Projects 	F-5

	Recommendation	Follow-up Actions Being Taken	CoI Ref¹
	such arrangement in a Stakeholder Management Plan which is accessible by all involved in the project delivery.		
4. Commercial Issues			
4.1	<u>Devising and developing a conflict of interest policy</u>		F-12
	- Developing a conflict of interest policy appropriate and applicable to projects of this nature, the administration of which may be assigned to the Project Coordination Meeting or other committees as appropriate.	<ul style="list-style-type: none"> • Recommendation under review • Procedure introduced for SCL Project to better manage firewalls where the same Design Consultants are currently employed by Contractors and MTRCL on Contract 1123 	
4.2	<u>Commercial settlements</u>		F-48
	- Including subcontracts within the provisions for commercial settlements set out in the EA to provide the Government with greater transparency of commercial settlements which have a significant impact on the settlement of the final contract value and greater control on the settlement of the contract final account.	This recommendation will be addressed by the Working Group on Commercial & Contract issues referred to above	Para 143 of Rowsell Expert Report
4.3	<u>Subcontracting arrangements and commercial settlements</u>		-
4.3.1	- Review the procedures for the approval of sub-contracts and any subsequent revisions which change the conditions and / or prices.	See item 4.2	F-47

	Recommendation	Follow-up Actions Being Taken	CoI Ref¹
4.3.2	- Review the arrangements for the commercial settlements of sub-contracts to include a stage for MTRCL to verify and accept that proposed settlements are in line with the approved sub-contract terms and conditions.	See item 4.2	F-48
4.3.3	- Review and rationalise the provisions for disallowable costs and consider incorporating works not undertaken in accordance with approved plans and procedures as a disallowable costs.	See item 4.2	F-49
5. Rules and Requirements			
5.2	<u>Clarifying design submission and consultation procedures</u>		-
5.2.1	- Review the wording of the Particular Specification in relation to alternative works design proposals to ensure that the process and terminology is aligned with the contract conditions.	See item 4.2	F-17
5.2.2	- Ensure that the construction method statements are in place based on the latest approved designs before construction commences.	<ul style="list-style-type: none"> • PIMS Practice Note on "Monitoring of Site Works" which includes the use and review of methods of construction is currently being updated to reflect the RACI of MTRCL in site inspection • All ITPs within current contracts have been reviewed against best practice since the SCL issues came to light • The PIMS Consultancy referred to above will also address this issue 	F-18

	Recommendation	Follow-up Actions Being Taken	CoI Ref¹
		for future Projects	
5.2.3	- Review the liaison arrangements between the Contractor’s design team, the Building Authority and MTRCL’s design and construction management teams to ensure common understanding of submission requirements and awareness of design issues and the forward programme of potential submissions.	<ul style="list-style-type: none"> The revised PIMS currently being prepared will address enhanced measures for stakeholder engagement and statutory submission processes. These PIMS will be RACI based At site level, regular meetings are now being held between all parties and BD to identify submission requirements and the status of submissions made, together with the prioritisation of submissions against the programmed works on site 	F-19
5.3	<u>Rationalising and clarifying supervision requirements</u>		-
5.3.1	- For future infrastructure projects, require site presence of the designer to assist in ensuring implementation of design intent in the works.	<ul style="list-style-type: none"> The role of the DLR on site is now being more strictly enforced in all existing Contracts to ensure that design related issues are dealt with efficiently The presence of Design Staff on site in future projects is being addressed in the Commercial & Contract Working Group referred to above 	470 (416)
5.3.2	- Review documents which set out supervision requirements and guidance to rationalise the documents to a more manageable and readable number, ideally with a view to producing an all-inclusive and bilingual “Supervision Manual” accessible to all involved in supervision and inspection procedures.	<ul style="list-style-type: none"> A new SCL Quality Management Plan (QMP) with a quick reference guide for staff on PIMS documentation has been prepared and issued to all project staff and is readily accessible on iShare The PIMS review being carried out by the External Consultants referred to above will also see a shift to flowchart based sub-process documents supporting clear RACI definitions, and clearer definition of minimum mandatory requirements (with mandatory documents vs recommended 'good practice' guidelines being separated into 	F-20 (419)

	Recommendation	Follow-up Actions Being Taken	CoI Ref¹
		<p>different document types for clearer reference and use).</p> <ul style="list-style-type: none"> This will mean shorter and easier to comprehend documents. The documents will be grouped together online into relevant disciplines (e.g. Construction Management) and sub-disciplines (e.g. Site Monitoring / Supervision), and will also be accessible online by relevant Job Title, but it should be noted they will not be published in the form of a 'Supervision Manual'. 	
5.3.3	- Develop a clear definition of supervision for the purpose of contractual obligations and adopt a consistent approach to terminology throughout the documentation, with requirements being specific about the information that needs to be recorded and certified.	<ul style="list-style-type: none"> See item 4.2 The PIMS being prepared by the External Consultant will include the details of the roles and responsibilities of the staff under the Contract with respect to their obligations. This Consultancy will be completed towards the end of 2020 and the revised suite of documents produced will be used to manage future projects 	F-21 (422)
5.3.4	- Make the frequency of supervision and inspections flexible and reactive to the compliance and performance of work with requirements, with less frequent supervision supported by self-certification and audits upon demonstration of consistently high-quality work.	<ul style="list-style-type: none"> See item 4.2 A new Independent Quality Assurance Team in Engineering Division, titled AM&V, for Second Line Defence has been set up to monitor performance of teams on site. PIMS training for all front line Project Staff has been enhanced to improve the site team's understanding of their supervision role. PIMS classroom training has been introduced and an online Training Module to be completed by all Projects staff are planned. This will be supplemented by discipline specific training. Specific training on quality management has been delivered to 	F-22 (416)

	Recommendation	Follow-up Actions Being Taken	CoI Ref¹
		project teams as has the retraining of staff nominated as self-auditors	
5.3.5	- Review the requirements for formally defined hold-points in relation to the contract provisions for not covering-up work without inspection and clarify whether inspection certificates apply to both hold-points and pre-covering up inspections.	The new iSuper digital system introduced on site will more efficient in terms of managing hold points and allows for easy identification of any hold points which have been passed without authorisation. The system is fully archivable for tracking of certification documents	F-23 (419)
5.3.6	- Review options for the use of the latest technological applications and tools to support the efficient effective recording of site records.	<ul style="list-style-type: none"> • See item 5.3.5 • New digital management tools for site records (iSuper and iComm) have been introduced. These include systems for managing the key activities of RISC Sheets and NCRs. Trials on a system for digitising Site Diaries are under way. In addition, a secure site communication system to record discussions/requests/actions between MTRCL and the Contractors, which allows for archiving of the communications records, has been introduced • The above systems have provided a quick short term solution. MTRCL is also looking to develop a more robust long term digital system for future Project Management. MTRCL's Projects Division has received endorsement from the Executive that all future Projects will be delivered using BIM technology from the Preliminary Design through to the hand-over of the Project to the Client. A Common Data Environment has already been developed in-house to facilitate this and will be used in the Ma Chai Hang Recreation Ground Contract to be awarded Q2 2020 and the Tung Chung Line Extension which 	F-24 (426-427)

	Recommendation	Follow-up Actions Being Taken	CoI Ref¹
		will also be awarded in Q2 2020. Enhanced site project management systems will be developed to be compatible with BIM and rolled out in future Construction Contracts	
5.3.7	- Ensure there are procedures in place to record who are undertaking supervision duties on a daily basis and that supervisors have the required level of competence.	<ul style="list-style-type: none"> • See item 2.2.1 for reference to the Working Group on Competency • Re-Training on CoP for Site Supervision 2009 to SIOW / IOW / ConE / SConE on appropriate Contracts has been carried out. This training now forms part of the training requirements for staff on new Projects as they come on line 	F-25 (422)
5.3.8	- Ensure that records are kept to support the possible application of the contractual disallowable cost provisions.	The iSuper system discussed in item 5.3.5 and 5.3.6 provide archived records on approvals for work to proceed which can be used to evaluate potential disallowed cost activities	F-26
5.4	<u>Reviewing site entry/exit systems and records</u>		F-27
	- Review the existing entry/ exit site staff recording system in relation to: <ul style="list-style-type: none"> • knowing who is on site; • supporting the payment of people under the commercial model; • knowing who undertook work inspections and who certified work; and 	This recommendation is currently under consideration	

	Recommendation	Follow-up Actions Being Taken	CoI Ref¹
	<ul style="list-style-type: none"> helping to confirm that the required level of supervision and the ratio of supervisors to workers. 		
5.5	<u>Reviewing non-conformance reporting</u>		-
5.5.1	- Review current guidance on non-conformance reports (“NCRs”) to ensure clarity and consistency on when NCRs should be issued.	<ul style="list-style-type: none"> The NCR process has been substantially revised to allow more detailed categorisation of NCRs, enhanced communication on issues with all stakeholders and increased visibility on close out rates. The system is now digitised for ease of recording and tracking NCRs PIMS have been updated to reflect the new system and staff trained in its use 	F-28 (408)
5.5.2	- Encourage “near-miss” non-conformance reporting to drive continuous improvement.	A pilot run of a module called "Quality Observation" under iSuper has been implemented on Contract 1123 and Contract 1128 since Sep 2019 for the MTRCL inspectorate to capture "quality issues" found prior to Hold Point inspections. The "quality issues" are logged and communicated to the relevant contractor(s) for action, and the due closure of which is monitored	F-29 (410)
5.5.3	- Maintain a single NCR database across all parties which is accessible to all supervisors and inspectors to allow recurrent issues to be readily identified.	<ul style="list-style-type: none"> A database on iShare capturing NCRs and issued by MTRCL and NCR Registers provided by contractors are being maintained for access by both parties covering all SCL Contracts For future projects MTRCL’s Projects Division will move towards one system using a digital platform 	F-30 (409)
5.5.4	- Review and enhance the NCR close-out procedures including effective monitoring arrangements.	See item 5.5.2	F-31 (409)

	Recommendation	Follow-up Actions Being Taken	CoI Ref¹
5.6	<u>Reviewing Project Management Plans (“PMPs”)</u>		-
5.6.1	- Make PMPs more comprehensive and relevant to the project by translating generic guidance into project specific requirements while minimising cross-reference to other documents.	<ul style="list-style-type: none"> The current PMP for the SCL Project has been amended to update information within the PMP which has been superseded As a long term objective, MTRCL will be revisiting the PMP format and contents to address the recommendations for future Projects. MTRCL has tasked the Projects Quality Working Group (PQWG) under the Projects Transformation Programme Board to address the recommendations prior to the commencement of the next major Project 	F-32
5.6.2	- Consider including an introductory section in PMPs setting out MTRCL’s corporate policies and the project strategic objectives to help steer the development of the project.	See item 5.6.1	F-33
5.6.3	- Include specific details about which PIMS manuals are applicable to a project and job roles.	<ul style="list-style-type: none"> A new SCL Quality Management Plan (QMP) with a quick reference guide for staff on PIMS documentation has been issued in May 2019. All project staff are notified of the issue of this PIMS document and it is readily accessible on iShare. Project staff training on specific PIMS relevant to their work task has also been implemented for existing SCL site staff since the SCL incidents occurred and will in the long term be expanded to train future Projects Staff across all roles and responsibilities on new Projects as they are progressed 	F-34

	Recommendation	Follow-up Actions Being Taken	CoI Ref¹
		<ul style="list-style-type: none"> MTRCL has commissioned a consultant (who has been engaged since October 2019) to review and revamp the PIMS. Recommendations relating to PIMS documentation will be addressed in the new PIMS accordingly. This review will also address relevant training requirements for staff in the revamped PIMS 	
5.6.4	- Consider including in the PMP (i) proposals for partnering arrangements and initiatives; (ii) checklists for sub-contract approval procedures; and (iii) commercial management procedures.	See item 5.6.1 bullet 2	F-35
5.7	<u>Reviewing Project Integrated Management System (“PIMS”)</u>		-
5.7.1	- Review and update PIMS procedures and manuals, to ensure alignment of project management guidance and procedures with contractual procedures.	<ul style="list-style-type: none"> As referred to above, an External Consultant has been appointed to review, reformat and re-write all PIMS based on RACI principles, a whole project lifecycle approach and a workflow based format. This Consultancy is being managed by a PIMS Working Group and will be completed in Q4 2020. As an intermediate solution, MTRCL has also formed an internal PIMS review group which is progressively updating the PIMS in their current format to address concerns 	F-36 F-37 (467)
5.7.2	- Highlight in the manuals the aspects of the guidance which need to be assessed for the specific	See item 5.7.1	F-36 F-39

	Recommendation	Follow-up Actions Being Taken	CoI Ref¹
	circumstances of a project and translated into project-specific guidance in the PMP, and the aspects of PIMS manuals which need to be converted from generic advice into project specific proposals.		
5.7.3	- Review training (with the contractor where appropriate) on PIMS and contract procedures, including ongoing refresher training and the coverage of any updates to the procedures.	<ul style="list-style-type: none"> • Since Q3/2018 a more structured training on PIMS and contract procedures (such as SCL PMP and SSP) has been provided to project staff and the contractor's staff. Training of this nature will be ongoing. An annual training plan on the subject is in place, which is subject to continuing review and updating under the auspices of the PIMS Working Group. This training will be sufficient to address staff needs for the remainder of the SCL Project • As part of the PIMS Review Consultancy looking at future Projects, further recommendations on training in PIMS specific to the roles of different staff will be further developed. As part of the PIMS Review project, an introductory Online Training Module is being developed which will become mandatory for all personnel involved in Projects delivery. This will be supplemented by additional training of staff on the specific PIMS procedures and process requirements that staff are required to adopt when performing their duties. • All PIMS documents will be related to Project Stage, Discipline / Sub Discipline, as well as to specific Job Titles, to enable a clearer definition as to which procedures relate to which relevant role 	F-38
5.8	<u>As-built drawings requirements and production</u>		-

	Recommendation	Follow-up Actions Being Taken	CoI Ref¹
5.8.1	- Review the current documents setting out requirements for as-built drawings to ensure consistency and clarity on roles, responsibilities and procedures, and pull them together in the PMP	The Project Transformation Board referred to above has set up a Project Quality Working Group who will be responsible, in collaboration with the External PIMS Consultant, for reviewing and updating all aspects of as-built documentation	F-40
5.8.2	- Clarify and maintain site records to support the delivery of the contractual requirements for the prompt recording of as-built dimensions and details	<ul style="list-style-type: none"> • See item 5.8.1 • The adoption of BIM in future Projects will improve the accuracy of as-built data by developing it in 'real time' as the works progress on site 	F-41
5.8.3	- Introduce rigorous monitoring of as-built drawing production and report the monthly progress to PSC	<ul style="list-style-type: none"> • See item 5.8.2 • The SCL Monthly Co-ordination Meeting with RDO/BD/GEO has been enhanced to investigate in depth submission matters, including as-built records. The status of submissions, including as-built records has been reported to PSC since Q4 2018 	F-42
5.9	<u>Clarifying method statement procedures</u>		F-43
	- Review and clarify the procedures for the submission and acceptance of working method statements	<ul style="list-style-type: none"> • PIMS Practice Note on "Monitoring of Site Works" has been updated in August 2019 to reflect, amongst other enhancements the RACI of MTRCL in site inspection • All ITPs within current contracts have recently been reviewed to ensure their continuing applicability to the works to be inspected 	