**Commission of Inquiry into the Diaphragm Wall and Platform Slab Construction Works at the Hung Hom Station Extension Under the Shatin to Central Link Project**

# MTRCL'S CLOSING SUBMISSIONS

## I. OVERVIEW

1. MTRCL takes its duties and responsibilities, particularly public safety, very seriously and has recently taken important steps to address any public concerns arising out of MTRCL's capital projects. The CoI will recall that MTRCL's witnesses emphasised that MTRCL's paramount consideration was safety[1].

2. MTRCL reiterates a point emphasised during both its written and oral openings; it is a "*learning organisation*", which makes continuous efforts to develop and enhance its management systems – MTRCL learns not only from its many successes, but also from challenges in its projects.

3. MTRCL has used its own PIMS to manage and deliver successfully railway projects for over 20 years. The system is certified to be ISO9001 compliant. The Project Management Experts, Rowsell and Huyghe, signed a JSPM[2] which stated:

> *"3. We agree that MTRCL is a very experienced organization with extensive experience and capability in the planning, delivery and operation of railway networks and systems in Hong Kong.*
> *4. We acknowledge that MTRCL has a proven track record in delivering many major railway projects."*

4. As part of its constant review and improvements, in April 2014 MTRCL's Board responded to public concerns over the XRL, constituting the IBC comprised of independent non-executive Directors. The IBC, together with two independent project management experts, reviewed MTRCL's internal systems, controls and

[1] See, for example, the oral evidence of: TM Lee at **[T32/17:8-18:18; 22:13-24]**; Rooney at **[T28/120:18-22]**; Kit Chan at **[T26/79:20-80:3**].

[2] **[ER1/9].**

management relating to the XRL, whereby two reports dated July and October 2014 were prepared containing various recommendations. The Chairman and Prof. Hansford were also members of the IEP which reported to the Government in December 2014.

5. MTRCL implemented the recommendations of the IBC and IEP reports by strengthening its corporate governance and the systems and processes which applied to large scale capital projects. It also established both the CWC and a new Engineering Division to strengthen MTRCL's "*check and balance framework*" and to provide the requisite controls and oversight of its capital projects.

6. On 21 June 2018, in response to the problems experienced on the SCL Project the MTRCL Board of Directors unanimously voted to mandate the CWC to conduct a review of MTRL's project management processes and procedures for the SCL Project with the assistance of an independent third party consultant.[3]

7. In August 2018, CWC appointed T&T to support its review, particularly how PIMS should be incorporated into the quality management and supervision aspects of all MTRCL's construction projects[4]. T&T's Interim Report[5] included recommendations for enhancing quality control management and supervision across MTRCL's projects, and Rowsell generally agreed with them[6].

8. CWC took action immediately to implement T&T's Interim Report, by recommending that a structured approach to the adoption of appropriate recommendations from T&T should be introduced to track the progress of their implementation into both existing and future contracts. MTRCL's Executive

[3] See paragraphs 22 and 23 of the witness statement of Fred Ma **[B1/B109]**.

[4] See the proactive measures already implemented by MTRCL, as summarised in the Memorandum dated 3 January 2019 from MTRCL's Stephen Hamill which is appended to Appendix D the Huyghe's Report [**ER1/2/Appendix D**], an updated version of which is appended to Mayer Brown's letter of 22 January 2019.

[5] **[B17/B24421-B24476]**

[6] **[T39/119:8-18]**; paragraph 200 Rowsell's Report [**ER1/1/86**].

Committee endorsed this approach in November 2018 and set up a Special Taskforce to oversee the implementation process.

9. The Taskforce's membership was drawn deliberately from both MTRCL's Projects and Engineering Divisions and includes representation from the design, construction, quality assurance, contracts and procurement sections and the Intelligent Portfolio Office (checks and balances). Each of the T&T recommendations has been assigned to a particular member of the Taskforce who is responsible for ensuring that the relevant, appropriate measures are being put in place at a working level to address the applicable recommendations. These measures either have been or are being developed across multiple groups and forums within both MTRCL's Projects and Engineering Divisions e.g. digital forms of communication and site supervision are now being introduced across the SCL Project,[7] whilst quality assurance professionals are studying how to better interpret PIMS documents and experienced site supervisory staff are developing enhanced training documentation to improve the training of front line staff in the management of quality matters on site.

10. T&T's recommendations can be broadly broken down into 6 categories which Rowsell agreed with [8] , namely: Processes & Procedures; Organisation; Commercial & Contractual Strategy; People & Capability; Project Control; and, Tools & Technology.

11. Rowsell accepted that by taking the steps it had to implement the T&T recommendations, MTRCL had acted both proactively and responsibly[9]. It is submitted that MTRCL should be commended for the way in which it has addressed the T&T recommendations in such an expeditious and structured manner, particularly as T&T's key issues such as training, management of site

[7] For further detail see section VI(ii)(d) below.

[8] **[T39/186:1-187:20]**.

[9] **[T39/188:16-189:14].**

supervision processes and documentation such as NCR and RISC Forms, the adoption of enhanced digital management on site and the review of the Quality Management Structure have been given priority. Other long term goals such as the restructuring of PIMS and the introduction of changes to contract documentation are under review and consultation and will in due course be put in place for future projects.

12. Coincidentally, the T&T recommendations are replicated in large measure by the PM Experts' recommendations[10].

13. An updated schedule of steps taken to implement T&T's recommendations is attached to these Submissions as requested by the CoI. MTRCL is determined to ensure that issues of a similar kind experienced on the SCL Project do not recur. That said, the weight of the independent structural engineering evidence that was put before the CoI was clearly and irrefutably to the effect that the Hung Hom Station structure is safe[11].

14. As for Leighton, MTRCL appointed it as the main contractor/registered general building contractor for the Contract 1112 works. Contract 1112 imposed obligations upon Leighton pertaining to the system of supervision, monitoring, inspection and reporting to ensure the compliance, quality, safety and integrity of the works[12].

15. Regrettably, as elaborated in further detail below, the evidence before the CoI reveals that there are a number of shortcomings on Leighton's part, including (without intending to be exhaustive and without prejudice to MTRCL's rights): failure to submit alternative design proposals in relation to changes to the permanent works; failure to prepare and maintain as-built records and other documents as required under Contract 1112; and non-compliance with its

[10] See Table 3 of Huyghe's Report [**ER1/2/67-81**].

[11] See further Section IV.

[12] For the detail see paragraph 7 of Kit Chan's statement dated 13 September 2018 [**B1/B263**]. See also paragraphs 44 to 49 of MTRCL's Opening Statement [**OS/5/7].**

contractual obligations on the quality of the works.

## II. THE PRINCIPAL MATTERS BEFORE THE COI

16. As might have been expected, the primary focus of both the factual and expert evidence that was placed before the CoI was directed at those events or elements of the construction of the works under Contract 1112 which could be said to give rise to genuine and realistic public safety concerns and which fell within its Terms of Reference.

17. The first two matters below were investigated in considerable depth.

### II(i) Coupler connections

18. The nature and extent of any non-compliant rebar/couplers i.e. whether the evidence placed before the CoI established that there *really was* the scale of unacceptable cutting of the threaded ends of the rebar alleged so that such rebar was not connected into the couplers, either properly or at all, thereby jeopardising the structural safety of the slabs and thus public safety.

19. In this regard and as foreshadowed in MTRCL's written and oral openings, there was a sharp contrast and palpable conflict between the evidence of MTRCL, Leighton and Fang Sheung on the one hand and the exaggerated, unsubstantiated and ultimately non-credible evidence of Jason Poon and his employees from China Technology on the other, without which this CoI would in all probability never have come into being.

20. It is submitted that in this context perhaps the most telling point for the CoI to grapple with when assessing the credibility of the China Technology evidence is that during the construction of the slabs Jason Poon *never* raised these serious allegations, which he accepted raised serious issues in terms of structural integrity and hence public safety, with either MTRCL or Government – even though he claimed that both he and his China Technology employees saw them happening and *before* concrete was poured over the cut rebar by the very same China

Technology employees, which pouring both concealed the alleged malpractice and created a potential "*time-bomb*" so far as the public safety concerns caused thereby were concerned.

21. Like MTRCL, the CoI may well consider that Jason Poon's omission to inform either MTRCL or Government was all the more remarkable given the facts that he is not the sort of character to shy from confrontation. He is far from the kind of quiet, timid sub-contractor who would keep silent if he had genuine concerns.

22. On the other hand, MTRCL's evidence is consistent and credible: MTRCL's inspectorate staff in around August/September to December 2015 identified several occurrences when a small number of rebars had been cut short and not properly connected to the couplers, all except 3 of which were rectified immediately to MTRCL's satisfaction. The weight of the evidence from both MTRCL and Leighton is that these incidents were identified in the normal course of MTRCL's and Leighton's supervision/site inspection and surveillance procedures.

23. Taking into account the results from the opening up exercise, there is no credible evidence to suggest the large-scale malpractice which Jason Poon has alleged and the CoI is asked to make a finding to such effect to allay public concerns in this regard.

24. In any event it bears emphasis that MTRCL's SE Expert, Glover, gave clear, cogent, and unchallenged evidence to the CoI that:

> *"The allegations of cutting of threaded bars had to be investigated to allay concerns about the extent of such malpractice, but that should not obscure the fact that such malpractice would have to have been on such an unimaginable industrial scale and, in addition, focused in specific areas, to have any effect whatsoever on the structural integrity of this construction, particularly in terms of making it unsafe – which it is not."*[13]

[13] See paragraph 8.2 of Glover's Report **[ER1/6/10]**. The CoI's and Leighton's experts, McQuillan and Southward, strongly concur with this view. See Section IV below.

The results of the opening up have not changed that assessment.

25. McQuillan, the CoI's SE Expert, also stated that the PAUT readings obtained as a result of the opening up exercise did not in general give him any indication that the threaded bar ends had been cut and thereby shortened.[14] In these circumstances, it is submitted that structural safety is not an issue and the CoI is asked to make a finding to such effect to allay any remaining fears harboured by the Hong Kong public so far as the allegation of cut couplers are concerned.

26. Sections III to IV below provide a detailed analysis of the evidence concerning the issue of alleged non-compliant rebar/couplers and structural integrity.

## II(ii) Change in connection detail for the EWL slab and the D-walls

26. During the course of the hearing, the CoI has become acquainted with what came to be known as the "*First Change*" (i.e. the change in reinforcement details within the D-walls) and the "*Second Change*" (i.e. the change in connection detail between the EWL slab and the east D-walls in Areas B and C) respectively. An overview of these changes is in MTRCL's opening and will not be repeated here[15].

27. MTRCL maintains, as it did in its oral opening submissions, that the First Change "*was reflected in six batches of BA14 submissions for the D-walls to the Buildings Department made between January 2015 and January 2016*", and the "*Buildings Department accepted all batches of the BA14 as-built submission for the D-walls on 5 May 2017*", such that "*there is no issue with this change in the reinforcement details of the east D-wall*" because "*it has been closed out by the Buildings Department and in fact it's of historical interest only*"[16]. It is submitted that the focus should therefore remain firmly on the Second Change, both from a structural safety and project management perspective.

---

[14] [**T44/100:19 – 101:17**] & [**T44/183:3 – 183:21**]. McQuillan also cast doubt upon the fact that the photographs at D1/D227-D228 demonstrates that a T40 Type A as opposed to a T40 Type B bar was being cut, which would not have caused any problem had it then been screwed into a normal coupler. [**T44/125:2 – 126:24**].

[15] [**T2/52:5-59:16**].

[16] **[T2/60:21-63:7]**.

28. MTRCL emphasises that the evidence placed before the CoI concerning the change in connection detail establishes indisputably that the change is an improvement on the original detail with a minimised risk of workmanship issues so far as the splicing assemblies were concerned and, in addition, had no impact on the structural integrity of the EWL slab or the D-walls. In this regard, Glover states in his report:

> *"A further point that also needs to be fully understood is that the Contractor's Alternative Detail for the EWL slab to the east Diaphragm Wall connection is a superior detail to the accepted connection detail described by the consultation drawings, both in terms of performance and constructability. In structural terms, it is reasonable to view this as a change of a design detail and not a detailed design change; the force actions have not been changed, but the detail has been substantially improved"*[17].

29. Glover's view is reflected in and entirely consistent with paragraph 3 of the JEM[18].

**II(iii) Errors in the 15 June 2018 Report[19] ("June Report")**

30. MTRCL produced the June Report at the specific request of RDO following media allegations at the end of May 2018 concerning defective coupler installation.

31. Section VI below contains a comprehensive analysis of the relevant factual evidence and project management issues. In summary:

    (i) The June Report was produced under great pressure of time in two weeks and at the same time as there were ongoing works to progress. Moreover, the focus at the time was squarely on the alleged defective coupler installations.

    (ii) The inadvertent omission to take into account the Second Change (which entailed less slab-to-wall coupler connections) led to the unfortunate inaccuracy in the estimated number of couplers in the EWL slab.

[17] See paragraph 8.7 of Glover's Report **[ER1/6/11-12];** also paragraph 98 of McQuillan's Report [**ER1/3/41**].

[18] **[ER1/3/117-119]**

[19] **[B1/B1-B46]**

(iii) The inaccuracy is regrettable but MTRCL emphasises that there was certainly no intention to mislead. MTRCL has been taking proactive steps to implement recommendations of T&T, Rowsell and Huyghe.

**II(iv) Ancillary matters**

32. In addition to the two principal matters which are referred to above, the CoI heard a limited amount of evidence concerning alleged defects in the construction works.

33. In respect of the use of mass concrete to backfill Area A, this has been explained by MTRCL[20], and as McQuillan rightly pointed out, *"[t]his is an approved cost saving method […]. It did not alter the structural dead weight and therefore did not compromise the resistance to flotation"*[21]. This is, quite simply, a non-issue[22].

34. None of the defects considered by the engineering experts, to the extent that they exist, pose any safety concerns so far as the public (or anyone else) is concerned.

> *"All agreed except Nick Southward (not part of his brief)*[23] *that miscellaneous workmanship issues eg spalling, voiding, gaps etc. were all repairable.*
>
> *The main discussion related to mis-aligned shear links. All agreed this was of no structural significance in the context of the slab rebar"*[24]
>
> *"[t]here is no evidence of any structural or serviceability problems with the D-walls. The only instance of dampness […] is well within the specified tolerance level"*[25].

35. Again, the CoI is invited to make a finding to such effect to allay any remaining fears harboured by the Hong Kong public so far as these defects are concerned.

36. A detailed analysis of the evidence and structural safety issues (or lack thereof)

---

[20] MTRCL's presentation dated 21 September 2018 **[A1/A30]**; paragraphs 98 to 100 of the statement of James Ho **[B1/B353]**.

[21] Paragraph 87 of McQuillan's Report **[ER1/3/36-37]**.

[22] See paragraph 98 below.

[23] Southward of Tony Gee served a report on behalf of Leighton which was entitled and limited to 'Change of Details at Eastern D-walls and Slabs' [**ER1/5/1-83**].

[24] JEM paragraph 4 **[B20/B26419]**.

[25] McQuillan's Report **[ER1/3/44]**.

concerning these defects or alleged defects is in Section IV(v) below.

## III. CHINA TECHNOLOGY'S ALLEGATIONS

37. China Technology/ Jason Poon made a number of serious allegations which led to the setting up of this CoI, as well as (unhelpfully although not entirely surprisingly) during the course of the hearing[26].

38. Broadly speaking, Jason Poon's allegations fall into the following categories:

(i) Cutting of threaded rebars on a large scale[27].

(ii) Corruption on site.

(iii) Miscellaneous matters, including new allegations raised during his cross-examination, including: (1) Lightweight concrete was wrongly used in Area A by Leighton;[28] (2) Lack of crimping of rebars; (3) Failure to use a torque meter to install coupler assemblies; (4) Top of D-walls was not constructed with through bars; and, (5) Chipping-off top of D-wall into an "*A*" shape.

39. Jason Poon's evidence is unsubstantiated and ultimately incredible.

### III(i) General observations on Jason Poon's credibility

40. The first point to note is that during the construction of the slabs Jason Poon never raised the allegations concerning defective rebars when he claimed that he and the China Technology witnesses saw the widespread malpractice happening and before concrete was poured by China Technology covering up the reinforcement.

(i) Jason Poon first raised allegations of rebar cutting in his 6 January 2017 email to Zervaas of Leighton[29] – some 8 months after concrete was poured

[26] Even China Technology's counsel in oral opening stated that so far as China Technology saw it, the crux of the CoI is "*essentially threefold*": (i) was there any cutting of threaded rebars; (ii) if so, who was or were the parties cutting them or directed the cutting; and (iii) where did the cutting occur and the number of threaded rebars involved: **[T1/64: 21 – 65: 4]**.

[27] Despite Jason Poon insisting that he only used the word "systematic": **[T10/20:21 – 21:7]**.

[28] Jason Poon's evidence to LegCo Panel Sub-committee on Matters relating to Railways **[A1/A85-A88]**.

[29] **[C12/C7937-C7938]**.

by China Technology – against a background of a commercial dispute with Leighton. This fact alone casts serious doubt over the genuineness of the allegation.

(ii) Contrast the unchallenged evidence of: (i) Philco Wong that Jason Poon did not mention rebar cutting or defective connections to him[30]; and, (ii) Raymond Au (Principal Contracts Administration Manager) that when he contacted Jason Poon at the request of Philco Wong, Jason Poon said that the matter had been resolved[31]. Indeed, the fact that Philco Wong directed Raymond Au to contact Jason Poon evidences MTRCL's understanding at the time that it was a contractual rather than a construction issue.

(iii) Jason Poon cannot explain why he did not raise the matter with MTRCL at the time the cutting allegedly occurred and was unable to give any convincing reason why he did not pursue the matter further or directly with MTRCL in January 2017, after he received payment from Leighton.[32] Nor was he able to give any convincing explanation as to why he waited for 9 months to issue a "*chaser*" to Leighton after January 2017[33].

(iv) Contrast the firm and, once again, unchallenged evidence of Rooney that Jason Poon never raised such issues with him in site walks.[34]

(v) Even Jason Poon's 6 January 2017 email asserted that the alleged malpractice took place between MTRCL's shifts and stated "*MTRC didn't discover such malpractice*" and "*[the] pour had been poured without finding on such malpractice finally*"[35]. The email contradicts Jason Poon's claim that he had told Rooney about the cutting, and his evidence that

[30] Philco Wong's witness statement §§43-45 **[B1/B150-B151]**.

[31] Raymond Au's witness statement §§4-7 **[B16/B13674-B13675]**; **[T32/48:11 – 49:19].**

[32] **[T9/105:3-108:23]** and **[T9/114:22-115:13]**.

[33] **[T8/20:1-17]**.

[34] Rooney's witness statement §§113-114 **[B1/B216]**; **[T28/91:15 – 92:14].**

[35] **[D1/D234]**; **[C12/C7937-C7938].**

MTRCL knew about it and was trying to catch the delinquents. Unsurprisingly, he was not able to answer the pertinent question from the Chairman why he did not raise the matter with MTRCL at the time when the offending act allegedly took place[36].

(vi) When he could not give any credible explanation why the matter was not raised with MTRCL at the time, he resorted to arguing that the June Report[37] "*by deduction*" confirmed that China Technology staff "*had reported*" rebar cutting to MTRCL[38] – which it did not.

(vii) Despite a number of opportunities for him to explain, Jason Poon was not able to give any credible reason why he did not raise the matter with MTRCL or Government at the time the malpractice allegedly took place[39].

(viii) Similarly, Jason Poon sent his email to the Secretary for Transport and Housing on 15 September 2017 amidst commercial disputes with Leighton[40]. When he reached settlement with Leighton he coincidentally informed Government that the matter "*had reached satisfactory understanding and full clarification ie the suspecting subject had been cleared now and no significant impact is retained … We believe it is a full and final end of the issue and may we invite to close all relevant files accordingly*" (emphasis added)[41]. It is inconceivable if Jason Poon held any honest belief in the existence of massive defective work that he could or would have written that email.

41. Jason Poon is far from the kind of quiet timid sub-contractor who would keep

[36] **[T10/127:15 – 131:2]**; see similarly **[T10/69:4 – 70: 19]**.

[37] At page 5 of the June Report **[B1/B5]**.

[38] **[T10/131:5 – 137:20]**.

[39] **[T7/140:15 – 23]**; **[T10/63:2 – 65:4]**; **[T10/143:16 – 145:21]**. **[T10/77:1 – 82:22]** is another example of Jason Poon not being slow to defend his corner: in this case, to issue a press statement to "correct" certain statements made by Hon Michael Tien on 31 May 2018 with which he disagreed **[C32/C24117]**.

[40] **[G3/G2033]**.

[41] China Technology email 18 Sep 2017 **[G3/G2048]**; Raymond Cheng's witness statement §§10-13 **[G3/G2022-G2023]**; SH Leung's witness statement §§9-17 **[G3/G2026-G2028]**.

silent if he had genuine concerns. He was not slow to argue with the Chairman[42] and with counsel for MTRCL[43]; he even accused counsel for the CoI of 'shifting goal posts'[44] and of unfair treatment[45]. He accepted that when an error in his witness statement was pointed out that he would get emotional.[46] His allegation that he did not voice out his alleged concerns about rebar cutting during site progress meetings because he was "*only a sub-contractor*" is simply incredible[47]; his explanation is also illogical[48].

42. Jason Poon is also prone to exaggeration, without any credible basis. The very serious corruption allegation is a good example. Further:

(i) Jason Poon mentioned corruption on site at the end of his interview with MTRCL in June 2018, without giving any details[49].

(ii) He did not mention corruption in his witness statements or police statements at all, despite knowing that the CoI had asked for all relevant information[50].

(iii) When he was confronted with the lack of any credible explanation for his allegation of large scale cutting of rebars, he resorted to alleging that there was corruption on the part of Leighton supervisors, but he was not able to give particulars of his allegation[51]. When pushed, he was driven to advance the baseless allegation that Fang Sheung *might* have gained advantage in

---

[42] **[T10/164:21 – 166:19]**.

[43] **[T10/74:20 – 76:18]**.

[44] **[T7/9:23 – 12:1]**.

[45] **[T7/145:2 – 148:7]**.

[46] **[T10/76:19 – 25]** – although he chose not to correct errors in his witness statements which he knew about **[T7/16:20-18:14]**, **[T8/109:18-118:17]**

[47] Jason Poon's witness statement §93 **[D1/D38]**.

[48] **[T11/27:19 – 31:6]**.

[49] Transcript of interview **[B5/B3089]**. Because of this allegation, MTRCL made a report to the ICAC, and did not refer to Jason Poon's allegations in the June Report: Lincoln Leong **[T32/156:14 – 158:20]**; Fred Ma **[T33/36:5 – 19]**; **[T33:43:14-16]**. There is no substance in China Technology's insinuation that MTRCL treated China Technology unfairly in presenting the June Report.

[50] **[T9/155:20 – 159:6]**.

[51] **[T7/75:17– 90:12]**; **[T11/40:12-18]**.

reducing labour cost[52], but remarkably that allegation was *not* put to Fang Sheung's witnesses. Clearly Jason Poon was making it up as he went along.

(iv) Ultimately, he had to accept that he had no direct evidence of corruption[53].

(v) The corruption allegation shows Jason Poon's troubling propensity to make very serious allegations with potentially wide-ranging consequences without any basis whatsoever. His evidence must be treated with considerable caution.

43. Another good example is the allegation that Leighton brought a large hydraulic cutting machine[54] on site to cut "*bundles*" of rebars when there is absolutely no evidence to substantiate that at all, [55] especially since such a practice would severely damage the threads and render the threaded ends unusable.[56] Jason Poon had to retract his evidence and change it unconvincingly to Leighton workers taking individual rebars from bundles and cutting them one by one with the hand held wire cutter.[57]

44. The beguiling attempt by Jason Poon to produce a large number of site photographs must be mentioned. Despite being explicitly asked to provide all relevant information to the CoI, Jason Poon did not mention anything about these unspecified photographs. Indeed, at one stage, Jason Poon claimed that China Technology had carried out a review and had found a "*large number*" of photos and videos supporting his allegation of rebar cutting, but some of these had been deleted pursuant to the confidentiality agreement with Leighton[58]. Further:

---

[52] **[T7/87:1 – 13]**; **[T10/45:3 – 48:2]**.

[53] **[T11/40: 12 – 18]**.

[54] Jason Poon later conceded that there was no such large hydraulic cutting machine **[T10/152:12 – 153:15]**

[55] Jason Poon's Police Statement (10 July 2018) §10 **[D1/D765.4]**; **[T7/55:16 – 56:25]**.

[56] See paragraph 69 and Appendix VI of McQuillan's Report **[ER1/3/33]**, where McQuillan summarised the CIC bar cutting experiments and observed (amongst other things) that when a hydraulic bending and shearing machine was used to cut rebars, the *"bar end was distorted and the threads were severely damaged, precluding any attempt to insert the bar into a coupler **[Appendix VI-15 to 18]**"*. **[ER1/3/92-94].**

[57] **[T10/7:5-24]**

[58] **[T8/13:20 – 17:21; 80:18 – 89:13]**.

(i) Jason Poon's police statement dated 31 July 2018[59] provided an index of numerous photographs and videos said to have been taken at site, without addressing them in any of China Technology's witness statements, including 5 witness statements from Jason Poon, the last of which was served after Day 5 of the hearing on 28 October 2018, and then amended on 29 October 2018.

(ii) An attempt was made by counsel for China Technology on Day 1 of the hearing on 22 October 2018 to adduce the photographs (said to be 21,718)[60]. When a query was raised about what exactly Jason Poon wanted to do, the response was, rather unhelpfully, that Jason Poon wanted them adduced as evidence before the CoI but would not rely on them at all[61].

(iii) In his examination-in-chief, Jason Poon attempted to raise various allegations based on certain photographs not mentioned in any of his 5 witness statements, and was given the chance to provide a further witness statement to explain what he wanted to say[62]. However, China Technology's counsel again informed the CoI that Jason Poon would not rely on the photographs at all[63].

(iv) Jason Poon was given a last chance to go through the photographs and provide all photographs relating to rebar cutting or shortening by 16 November 2018. The Chairman went further, and told Jason Poon that if he had found other compelling photographs, an application could be made to adduce them as well. Jason Poon said he would consider it, but in the event the CoI received no further response from him in that regard[64].

---

[59] [**D1/D829-D832**].

[60] **[T1/63:25 – 64:17; 76:12 – 82:1]**.

[61] **[T1/86:14 – 89:8].**

[62] **[T6/116:17 – 136:22]**.

[63] **[T6/143:12 - 14]**.

[64] **[T8/106:12 – 108:14]**.

(v) It is patently obvious that other than the photographs that Jason Poon had actually referred to[65]. there is nothing to support any suggestion that the photographs contain any, let alone credible, evidence of rebar cutting or other malpractice. This appears to be a case of "*setting the stage*" to put the blame on the CoI for not allowing him to present evidence to the CoI.

**III(ii) Evidence reveals limited incidents and a small number of cut rebars**

45. Jason Poon alleged that as many as 30,000 defective rebars were involved: China Technology's email 15 September 2017[66]; although he seemed to retract from that figure in his oral evidence[67]. He mentioned different numbers at different times: in Apple Daily's report dated 30 May 2018 the number of defective coupler assemblies given was 5,000 (it is obvious that the information was provided by Jason Poon)[68]; in the interview with MTRCL on 13 June 2018, however, he put forward a "*rough estimate*" of 1,000 rebars being cut[69]. In his oral evidence, 1,300 was mentioned[70].

46. Nevertheless, Jason Poon never substantiated any of the figures he deemed appropriate to parade before different audiences at different times.

47. When confronted with the absence of any foundation for his allegation, Jason Poon resorted to new allegations never mentioned before, including: failure to use a torque meter to install the rebars; absence of crimping; installed rebars should not have any exposed threads, etc[71]. These allegations should be rejected:

(i) There is no evidence supporting failures in respect of crimping of rebars, or that crimping has any relevance. This baseless allegation simply faded

[65] See List of 39 photographs supplied by China Technology to the CoI **[A1/A415-A421]**. Even then, only a few of the photographs are relevant.

[66] **[C12/C7987]**; **[T8/32:3 – 7]**.

[67] **[T8/58:25 – 59:8]**.

[68] **[A1/A41-52]**.

[69] Jason Poon's witness statement §87 **[D1/D37]**; **[T8/57:2 – 59:8]**.

[70] **[T8/55:22-24]**.

[71] **[T8/30:25 – 44:23]**.

away.

(ii) The allegation that there should be no exposed threads at all is contrary to BOSA's manuals, of which Jason Poon was ignorant[72]. The claim is unequivocally contradicted by BOSA's evidence given during the hearing[73].

(iii) Similarly, despite Jason Poon's reliance on not using a torque meter, it is abundantly clear that he was oblivious to the fact that BOSA did not require the use of any specific instrument such as torque meter to install the rebars[74].

(iv) No evidence remotely supports any of his other allegations.

48. Eventually, Jason Poon conceded that his case on public safety was that about 5% of the couplings or 1,000 (based on his unsubstantiated "*rough estimation*") had been cut short, but that 5% defective couplings would not undermine the essential structural integrity of the D-walls and platforms[75].

49. There is simply no credible evidence in support of any rebar cutting of the kind or scale alleged by Jason Poon and the CoI is invited to make a finding to such effect to allay any public concern in that regard.

50. MTRCL witnesses confirmed 6 incidents of cut rebars between August/September and December 2015:

(i) The 1st incident occurred in around August/September 2015 when Kobe Wong found 1 or 2 cut rebars in Area C1-1 or C1-2. He immediately informed Leighton's supervisor Chan Chi Yip, and Kobe Wong personally supervised the rectification work on the same day[76].

---

[72] **[T36/99:5-103:1]**; **[H25/H44854]**.

[73] Paulino Lim **[T36/99:5-25]**.

[74] [**A1/A508** (non-ductility couplers)] ; [**A1/A590** (ductility couplers)]; Paulino Lim [**T36/86:15-87:10**].

[75] **[T8/52:18 – 54:8]**.

[76] Kobe Wong's witness statement §§68-73 **[B1/B438-B439]**.

(ii) The 2nd incident took place in around October/November 2015, in Area B. Similar to the first incident, Kobe Wong saw cut threaded ends of 1 or 2 rebars. Although he did not personally supervise the rectification work, he inspected the rectified rebars and couplers and saw that they were all compliant[77].

(iii) The 3rd incident took place on 15 December 2015 when Andy Wong found 1 or 2 rebars had been shortened in Area C3-2/C3-3. When Kobe Wong inspected the area personally, he found 5 rebars had been shortened and not screwed into couplers and that the rebars were barely touching the couplers. Kobe Wong informed Chan Chi Yip of Leighton and the defective rebar coupling assemblies were rectified on the same day. Kobe Wong sent an email to (inter alios) Leighton's Joe Leung, Andy Ip, Kevin Harman and Edward Mok, whereby Leighton issued NCR 157 to Fang Sheung[78].

(iv) The 4th and 5th incidents occurred in around December 2015, after the 3rd incident. Kobe Wong again found one or two rebars with threaded ends cut short, in Area C1-5 and Areas B-4/B-5 respectively. The defective rebars were rectified shortly afterwards or on the next day[79].

(v) The last incident known to MTRCL witnesses occurred between 16 and 31 December 2015, when Andy Wong during regular surveillance in Area C1-5 saw 5 to 6 rebars which were not screwed into couplers. He informed the Leighton site staff and Leighton/Fang Sheung managed to rectify 3 of the defective rebars. However, 3 of the defective rebars located in the lower part of the top mat could not be remedied before concreting commenced.[80]

51. On the other hand, the evidence of China Technology's witnesses (other than

---

[77] Kobe Wong's witness statement §§74-75 **[B1/B439-B440]**.

[78] Kobe Wong's witness statement §§77-84 **[B1/B440-B441]**; Andy Wong's witness statement §§17-29 **[B1/B452-B454]**; email with photographs **[B10/B7456-B7460]**; NCR-157 **[B6/B4121-B4132].**

[79] Kobe Wong's witness statement §§85-86 **[B1/B441]**.

[80] Andy Wong's witness statement §§30-37 **[B1/B454-B456]**; **[T30/128:22-129:15; 130:7-20]**; **[B5/B2902].**

Jason Poon) of witnessing rebar cutting is not credible:

(i) Each of But Ho Yin, Ngai Lai Chi, Li Run Chao and Chu Ka Kam purport to confirm events described in Jason Poon's witness statement which allegedly took place when they were not even on site, when they could not possibly have any personal knowledge of such matters.

(ii) Despite their claims that they had seen cutting of rebars (from a long distance), and were told to report to MTRCL (in the case of But Ho Yin)[81] or take photographs (in the case of Chu Ka Kam),[82] none of them did anything of the kind and could not explain why they did not comply with their instructions.

(iii) The simple fact is that had there been such repeated incidents of rebar cutting as allegedly witnessed by China Technology's witnesses (as well as Jason Poon), there is no conceivable reason why these were not reported to, or formally raised with, MTRCL or even Government at the time.

(iv) Overall, their evidence is contradictory, evasive and confusing.

52. In any case, Jason Poon unequivocally accepted that even according to *all* China Technology witnesses including himself, they knew of a total of just *12 incidents* of rebars being shortened, which China Technology proceeded to concrete over.[83] It is most regrettable, if they did indeed witness any malpractice at the time, that they elected not to alert MTRCL or Government immediately.

53. It is also important to note that the China Technology witnesses are not able to give clear evidence as to what type of rebars were being cut. Significantly in this regard, it is reasonably clear that even in the photograph which is, perhaps, the closest objective evidence that seems to show a worker cutting a threaded rebar

[81] **[T3/128:18-24]** and But Ho Yin's witness statement §13 **[D2/D912-D913]**.

[82] **[T6/72:3-73:5]** and Chu Ka Kam's witness statement §§14-15 **[D2/D974]**.

[83] **[T10/167:10 – 173:21]**.

with a handheld wirecutter taken by Jason Poon on 22 September 2015,[84] the rebar in the photograph appears to be a *Type B* T40 rebar: a Type B rebar had 22 threads while a Type A T40 rebar had 11 threads[85]. If, therefore, that (assumed) cut Type B rebar was screwed into a coupler on the adjacent bay of the slab, it would still be technically acceptable if the "shortened" rebar was screwed into the coupler fully[86].

## IV. NO STRUCTURAL SAFETY ISSUE

### IV(i) Joint Expert Memorandum

54. The SE Experts' evidence strongly supports the conclusion that there is no safety issue arising from any defective coupler assembly works and that the Hung Hom Station structure is safe and will perform as intended.

55. Importantly, all SE Experts[87] held a without prejudice meeting on 18 December 2018 and signed the JEM[88] recording their agreements on matters discussed[89].

56. At various parts of their evidence, Au and Yeung attempted to resile from the JEM[90]. Au and Yeung complained they were not given sufficient information prior to the meeting, there was no agenda and they could not do any preparatory works for the meeting. Au further complained that it was a "*very lengthy meeting*" (which took place between 11am and 2:30pm) and that he was "*starving*"[91]. Incredibly, he alleged that he did not wish to prolong the meeting by raising further

---

[84] **[D1/D228]**; see McQuillan's annotation **[ER1/3/107] ; [T44/101:7-17]**.

[85] McQuillan's Report §§73-74, 108, Appendix IX [**ER1/3/34, 44-45, 107**]; Paulino Lim **[T36/84:15-18; 99:5-100:3]**. Paulino Lim of BOSA, based on the rebar having 13 threads, thought it was a T50 Type A rebar: **[T36/95:13-17]**, but only T40 threaded rebars were used in the construction of the EWL slab. McQuillan **[T44/100:23-101:17; 125:2-126:15]**.

[86] Paulino Lim **[T36/107:4 – 19]**; **[T44/126:7-127:3]**.

[87] McQuillan for the CoI; Au for the Government; Glover for MTRCL; Southward for Leighton; Yeung for China Technology.

[88] **[ER1/3/120-123]**.

[89] [**T44/81:16-20; 88:15-16]**.

[90] E.g. Additional Comments on the JEM by Au **[G20/G15046-15048]**; [**T40/61:3-62:4; 66:22-68:24]; [T41/68:11-25]**.

[91] If it is a matter under consideration at all, food was offered during the meeting: [**T44/89:14-16]**.

objections[92].

57. It is not open to Au and Yeung to go into the methodology which resulted in the without-prejudice agreement to justify their departure therefrom. As the Chairman rightly noted, "*we had a group of eminent engineers who spent a deal of time together, debating the issue, as we encouraged, so they were free to say what they wished to say, they were free to put their reservations in, and to enter into no doubt very robust argument when necessary, and they did come to an agreement to which all of them put their signature*"[93]. It neither assists the CoI nor the public for Au and Yeung to resile from their agreement in such manner. In particular:-

(i) McQuillan deliberately decided to set no agenda for the meeting. He was aware of the fact that different experts at the meeting would have different issues that they wished to raise. The experts were free to discuss anything that anybody wished to raise and leave the meeting[94].

(ii) The experts were able to agree on many issues that were raised during the meeting. All the experts present contributed to the drafting of the JEM. Contrary to Au's insinuation that he was somehow forced to sign the JEM, like all other experts present, he had ample opportunity to consider the contents of the JEM. In fact, having considered its contents, he decided to insert a caveat at paragraph 3 of the JEM before signing it.[95] This complaint has no merit.

58. There is no basis whatsoever to doubt the validity of the JEM.

**IV(ii) The structure has a large degree of redundancy and robustness**

59. First, the experts agreed that "*less than 50% of the bottom steel was required for Code compliance purposes*". Further, "*irrespective of the code requirement, the*

[92] [**T40/61:3-24]**; Yeung's Report at §44 **[ER1/8/10]**.
[93] [**T40/76:2-14]**.
[94] [**T44/87:9-88:16]**.
[95] [**T44/88:17-89:2]**.

*EWL slab does not, in theory, rely on steel at the interface, at the bottom, for flexure and shear capacity*"[96]. Notably:

(i) As McQuillan forcefully explained, the bottom mat of rebar at the EWL slab and D-wall interface will never be in tension.

(ii) In its completed state, the D-walls of the box structure are being pushed inwards because of the external soil and water pressures, and the EWL and NSL slabs act as struts in compression against the D-walls. The top of the D-wall at the interface with the EWL slab, if unrestrained, is always pushing inwards against the bottom of the D-wall and at the same time trying to pull out from the top of the EWL slab because of the inward curvature of the D-wall between the EWL and NSL slabs. The resulting deflection and bending moment is that at the interface between the EWL slab and the D-wall, the bottom of the slab is always in compression with the joint trying to close, whereas the top is always in tension trying to open.

(iii) The reason why bottom mat couplers (which are always in compression) are required for the EWL slab is to comply with the HKCOP 2004. McQuillan concluded that, Code compliance aside, in terms of structural and safety requirements the bottom mat rebars are redundant[97].

(iv) Glover and Southward confirmed that view. The quantity of rebar in the EWL slab soffit and the top of the NSL slab is substantially over-provided. As the Chairman observed, that is in the circumstances an assurance and comfort[98].

60. In other words, "*minimal engagement length [of coupled rebars at the bottom mat*

[96] JEM §§1-2 **[ER1/3/120-121]**

[97] HKCOP 2004 at section 9.3.1.3 **[H8/H2964]** provides that "*in simply supported slabs or end support of continuous slabs, half the calculated span reinforcement should be anchored into the support*"; McQuillan Report §§14, 27-32 42, 89-91, App II-7 **[ER1/3/18, 21-22, 25, 38-39, 68-69**].

[98] Glover's Report at §§5.1-5.5, 5.8, 8.10 **[ER1/6/5-6, 12-13]**; **[T42/114:16-116:25]**; **[T44/8:19-25; 113:22-114:1].**

*of the EWL slab, if any] is irrelevant*"[99] in terms of structural safety[100].

61. The NSL slab acts like the EWL slab but in reverse in that it tries to bend upwards. The NSL slab has to resist the very significant uplift pressure caused by the high external groundwater level relative to the level of the internal groundwater at the underside of the NSL slab. The top of the NSL slab is in compression and therefore the top mat couplers at the D-walls are not required structurally. The bottom mat coupled connections are critical in terms of the flexure and shear capacity of the NSL slab. The barrettes improve the structural performance of the NSL slab. There is no evidence of any distress in the NSL slab and no reported problems[101].

62. As to Code-compliance, it is clear from the Foreword to the HKCOP 2004[102] that the guidance given therein is not mandatory and the design parameters set out therein are sufficient, but not imperative conditions, to achieve a safe and robust structure[103]. Therefore, deviation, if any, from the HKCOP 2004 does not lead to the conclusion that the structure is not safe. Au's suggestion that HKCOP 2004 provides mandatory minimum requirements is contrary to the expressed status of HKCOP 2004 and has no merit[104]. In any event, McQuillan, Glover and Southward are satisfied that Code-compliance has been achieved[105]. Indeed, in Glover's view the quantity of rebar provided in the soffit of the EWL slab is substantially over-provided[106].

63. The experts were unanimous that currently the BD has no specific design and construction requirements in respect of seismicity but requires compliance with

---

[99] McQuillan's Report at §122 **[ER1/3/38]**

[100] **[T44/112:16-113:6];** In McQuillan's words, "*you can sever the reinforcement [at the bottom mat of the EWL slab] and the slab would still carry the load as intended. It wouldn't exceed its bending capacity; it wouldn't exceed its shear capacity*".

[101] McQuillan's Report at §§106-107 **[ER1/3/44]**; Glover Report at §5.8 **[ER1/6/6]**; [**T41/47:22-50:24]**.

[102] **[H8/H2821]**.

[103] Glover's Report §5.7 [**ER1/6/6**].

[104] Au's Report at §§3.1.1, 6.2.1 **[ER1/7/5, 9]**; **[T41/40:10-41:20]**.

[105] McQuillan's Report at §126 **[ER1/3/49]**; Southward's Report at §9.3 **[ER1/5/25]**; [**T42/102:3-9]**; **[T44/19:24-25]**.

[106] Glover's Report at §§5.7-5.8 **[ER1/6/6]**.

the ductility requirements of HKCOP 2004, including couplers. Further:

(i) A ductility coupler is designed for extreme loading conditions where the connection is subjected to cycles of stress reversal (tension to compression). In Glover's view, given the low to moderate seismicity of Hong Kong[107], the specification of ductility couplers is an unnecessary requirement for the Hung Hom station box. Buried box structures around the world have survived very heavy ground movement and remained effectively in their elastic zone[108].

(ii) In McQuillan's view, with which Au and Glover agreed, the geometry of the connection between the EWL slab and the east D-wall precludes any ductility. The structural plastic deformation which might occur during seismic activity will develop lower down the D-wall. Ductility couplers are therefore not required where used in the EWL slab to D-wall joint[109].

(iii) In any event, Code-compliance is deemed to provide some inherent structural resilience against a seismic event[110].

64. Secondly, the MTRCL/Leighton Joint Statement[111] confirms that for Areas B and C, the reinforcement details of the EWL slab connection at the top of the east side D-wall had changed in the majority of the panels, so that through bars were used instead of couplers connecting rebars on both sides of the D-wall.

65. The opening up results confirm that the top of east D-wall panels was in general constructed in accordance with the proposed design amendment drawings[112].

66. Consequently, given that the top of the west D-wall has a different design and configuration involving vertical couplers, any potential problem with the coupler

[107] Information Note 08/2015 "Seismicity of Hong Kong" **[A1/A695]**.

[108] Glover's Report at §4.5-4.7 **[ER1/6/4-5]**; [**T43/99:10-100:8]**.

[109] McQuillan's Report at §89(2) **[ER1/3/38]**; Glover's Report at §8.9 **[ER1/6/12]**; **[T40/62:18-66:14]**.

[110] McQuillan's Report at §§42-44 **[ER1/3/25-26]**; **[T40/59:4-14; 62:8-17]**.

[111] **[B19/B25486].**

[112] **[OUI/OU437-OU439]**

connections at the top mat of the EWL slab is in a very limited area and, obviously, very localised. It is not just a question of whether couplers are screwed insufficiently and/or partially cut, but also a question of their location. As McQuillan emphasised in his evidence, the top of wall coupler installations are only safety critical in the very few east D-walls panels which retained couplers and have no through bars[113].

67. Importantly, the clear and convincing evidence of McQuillan, Glover and Southward is that the through bar reinforcement detail is superior to the original arrangement accepted by BD. Further, JEM §3 records all experts agreed unequivocally that "*the change from couplers to through bars in the top of the east D-wall was a better detail and provide more steel across the interface (subject to a review of the internal stresses at the top-of-wall construction joint relating to the "first change" and its rebar detailing). Notwithstanding, all agreed the outcome would not show the construction joint to be problematic*"[114]. Further:

(i) Notably, in this regard Atkins has carried out the required check and demonstrated there is no issue as the stresses are within acceptable levels[115].

(ii) Au commented that Atkins only carried out some calculations for a typical slab-wall joint which is not enough and that there are problems with the calculations, but was unable to provide what he considered to be the correct calculation[116]. It should be noted that calculations carried out by Mannings were only disclosed by Government on the last day of the SE Experts' evidence. However, Au informed the CoI that Mannings does not have all the base data to carry out the calculations. As Government's counsel

[113] [**T40/86:21-89:6**]; **[T44/97:21-98:10; 133:21-135:14]**.
[114] [**ER1/3/118**].

[115] Atkins' calculations for internal stresses at the construction joint (cut-down wall top interface) for the 1st and 2nd Changes **[J6/J4556-J4567]**; McQuillan's Report at §118 **[ER1/3/47]**; Southward considered Atkins' calculations as "*extremely conservative*" because in his view, there cannot be any more shear force: [**T42/118:12-119:13]; [T43/4:1-15]**.

[116] Au's Report at §§6.4.3.3-6.4.3.7 **[ER1/6/11-13]**; [**T40/156:21-158:8]**; [**T41/20:1-4].**

observed, given that the calculations were done on the basis of incomplete base data, they would not really assist the CoI[117]. That said, the fact remains that all experts agreed that the outcome of such calculations would not show the construction joint as a result of the through bar connection details to be problematic[118].

(iii) Anyway, McQuillan considers the suggested calculations are "*pedantic and unnecessary*", and a "*complete overkill and a total waste of resource*".[119]

68. Further, the through bars eliminate the vertical construction joints at the top of the D-wall with the top of the EWL slab and the OTE slab. As Southward explained, these interfaces are points of high stress and as a matter of good practice HKCOP 2004 recommends that construction joints are avoided in points of high stress. The stress on the horizontal construction joint as a result of the change is lower than the original vertical construction joints[120]. Further:

(i) HKCOP 2004 at section 8.7.1[121] permits forces to be transmitted from one bar to another by: (1) lapping of bars; (2) welding; or, (3) mechanical devices, thereby assuring load transfer in tension-compression or in compression only. There is no evidence that the changes have reduced the area of rebar provided and thus reduced the tensile and/or shear capacity of the EWL top-of-slab to D-wall connection. On the contrary, the as-constructed detail increases the amount of longitudinal reinforcement that connects the EWL slab to the D-wall so the structure is stronger with more robustness and redundancy[122].

---

[117] [**T40/84:10-24]; [T44/67:13-68:13]**.
[118] Au attempted to resile from his agreement during his oral evidence **[T41/68: 11-25]**. In this regard, as above, he had no good reason for doing so.
[119] [**T44/121:10-122:21]**.
[120] **[T42/107:8-108:5]**.
[121] **[H8/H2946]**.
[122] McQuillan's Report at §53 **[ER1/3/28]**; Report by Tony Gee on Change of Details at Eastern D-walls and Slabs dated 16 September 2018 at Section 9 **[H14/H35293-H35295]**; Southward Report at §9.5.1 **[ER1/5/26]**.

(ii) As McQuillan explained, the original design is analogous to a "*butt joint*" whereas the through bar reinforcement detail is analogous to a "*shelf joint*", wherein the trimmed-down D-wall is encapsulated and "*clamped*" by the EWL slab bending away in one direction, the OTE bending away in the opposition direction, and the self-weight of the integral "*block*" of reinforced concrete which bears down on the top-of-wall construction joint. The "*block*" is prevented from splitting above the D-wall by the embedded tension rebar.

(iii) The internal stresses at the top-of-wall construction joint are all of compressive nature. Any tendency for a shear force to develop across the interface would be resisted by the "*clamping*" action of the EWL and OTE slabs which bear against the D-wall[123].

(iv) This is consistent with the view of Southward and Glover. Glover also noted that because of the geometry of the EWL slab and the OTE slab forming effectively a continuous slab locking in the top of the wall into a "*rebate*" in the slab soffit, the quality of the construction joint has a minimal effect on the performance of the slab to wall connection[124].

69. Thirdly, the low percentage strength utilisation generally throughout the structure[125] means the impact of any defective coupler connections on structural safety is low.

70. As Glover noted, most elements in a structure are not operating at 100% of their capacity under full operational loadings. This can be a result of prudent design, standardisation or the fact that the critical loading conditions had passed[126].

---

[123] McQuillan's Report at §§98-100 **[ER1/3/41-42]**.
[124] Glover's Report at §§8.7-8.9 **[ER1/6/11-12]**; Southward's Report at §§9.2-9.3 **[ER1/5/25]**.
[125] The strength utilization of a structural element is the ratio between the force applied to the structural element and the design ultimate strength of the structural element: Arup's Assessment Report on Holistic Study to verify as constructed condition dated 9 November 2018 at §4 **[B19/B25128] [T42/114:2-9**].
[126] The measure of this over-provision is referred to as the percentage strength utilisation of an element: Glover's Report at §6.6 **[ER1/6/8].**

71. Three reputable consulting engineering companies (Atkins, Arup, and COWI) have assessed and reviewed the strength of the station box structure. The structures under consideration do not generally perform above a utilisation of 50 percent, and sometimes less.[127] McQuillan concluded that structural utilisation throughout is relatively low, meaning that there is adequate reserve capacity in the EWL slab and its east D-wall connections[128].

72. The low levels of utilisation arise in great part from the phased nature of the construction. During construction, the EWL slab was free spanning between the D-walls and subjected to severe construction loads and the slab was designed for these extreme conditions[129]. These loads have subsequently reduced with associated reduction in the stresses in the EWL structure. Further:

    (i) In addition, extra supports have been constructed in the form of columns and walls from the NSL, which reduce the spans of the structures and the effects of subsequent operational loadings[130].

    (ii) The track way lies virtually over, and loads directly onto, the D-walls. The cyclic loading on the EWL slab arising from train operation is consequently less than would be expected from other sources such as an earthquake[131].

    (iii) Glover concluded that these low levels of utilisation confirm that the structure has a comfortable level of robustness and redundancy. It follows that the demands on the coupler connections are very much less than expected.[132]

---

[127] Arup's Holistic Study to Verify As-constructed Condition Assessment Report dated 9 November 2018 at §4.1 **[B19/25128]**; COWI Report at §6 **[ER1/4/30-34]**; Au **[T41/35:18-36:4]** Southward Report at §16 **[ER1/5/51-52].**
[128] McQuillan's Report at §89(7) **[ER1/3/39].**
[129] [**T41/13:18-14:8].**
[130] These columns and walls provide similar support for the NSL slab. As Glover explains "*the upthrust in the middle of the spans [of the NSL slab] is being taken up to the EWL slab"*: **[T43/155:3-10]**; **[T44/15:13-16:12]**; McQuillan further explained that the live load on NSL would further alleviate the bending moment caused by the upthrust in the NSL slab **[T44/157:16-158:9].**
[131] **[T41/41:21-42:16].**
[132] Glover's Report at §§6.10-6.13, 8.4 **[ER1/6/9, 11]**; *see also* Glover's confidence in the reserve of strength [**T43/126:8-15].**

73. Fourthly, the identified individual incidents of defective coupler connections do not raise any structural safety concerns.

74. The evidence reveals a very limited number of rebars which might have been cut short[133]. In Glover's words, such malpractice "*would have to have been on such an unimaginable industrial scale and, in addition, focused in specific areas, to have any effect whatsoever on the structural integrity of this construction, particularly in terms of making it unsafe*" [134]. Therefore, even assuming that all of these incidents were not Type B rebars being cut short for use as Type A rebars, the confident conclusion could be reached that the as-constructed platform slabs are structurally safe.

75. Further, McQuillan has reviewed the relevant evidence and concluded that there is no structural safety concern arising:-

(i) In relation to Andy Wong's evidence that there were three non-coupled starter bars located at the lower part of the top mat of rebars of the construction joint in Area C1-5 which were not rectified[135], McQuillan is of the view that given that there is so much shear over-capacity the overall integrity of the construction joint is not compromised[136];

(ii) In relation to NCR 157[137], which involved a defective coupler assembly at the junction of the east D-wall and a construction joint, these were immediately remedied and NCR 157 was subsequently formally closed out[138];

---

[133] Even the preliminary results of the opening up to date are inconclusive: McQuillan [**T44/98:23-99:20**].

[134] Glover's Report at §8.2 **[ER1/6/10].**

[135] Andy Wong's Witness Statement at §§30-34 **[B1/B454-455]**; [**T30/128:16-129:15]**.

[136] McQuillan's Report at §97 **[ER1/3/41]**.

[137] **[B6/4121-4132]**.

[138] McQuillan's Report at §96 **[ER1/3/40]**; The other incidents of defective coupler connections identified by MTRCL and/or Leighton's frontline staff (apart from Andy Wong's second incident) were all remedied: Kobe Wong's Witness Statement at §§66-88 **[B1/B437-B442]**; Edward Mok's Witness Statement at §§28-48 **[C12/C8113-C8117].**

(iii) In relation to the "rebar cutting" photograph[139], which appears to show a worker cutting a Type B threaded rebar[140], this has been addressed in paragraph 53 above[141].

76. More importantly, as Southward rightly highlighted, the structure has already been built and the load on the couplers is already there and there is no sign of distress - with which McQuillan and Glover agreed. If it was going to fail, it would have already failed as its critical load condition has already passed during construction. The future loading on the coupler assembly is due to the trains as they move over the slab and the stress in those bars is "*quite small*". While trains are heavy, they are nothing compared to the weight of the 3 metre slab. There is no safety issue[142].

77. Thus, the station box structure has a large degree of redundancy and robustness, consequently comfortable margin of safety which supports Glover's, McQuillan's and Southward's conclusion that the structure is safe for its intended lifespan[143].

**IV(iii) Opening Up exercise does not reveal any safety concern**

78. The opening up works commenced on 10 December 2018 [144], with two principal objectives: (i) to verify the as-constructed conditions of the EWL slab to D-wall connection; and, (ii) to investigate the workmanship quality of the D-walls, the EWL and NSL slabs to D-wall connection, and concrete and steel reinforcement.

79. While the "*pass*" criterion specified by the HyD in its online results bulletin is a 37mm thread engagement length for a T40 Type A coupled assembly [145], McQuillan, Glover and Southward conclude that for the purpose of assessing

---

[139] **[D1/D227-D228].**

[140] In this regard, Paulino Lim has given evidence that while the cutting of a Type B threaded rebar to be used as a Type A threaded rebar is not recommended, it is technically possible **[T36/116:15-20]**.

[141] McQuillan's Report at §108 **[ER1/3/44-45]; [T44/125:2-127:3].**

[142] [**T42/133:12-134:16]**; **[T43/64:8-15; 65:21-66:6; 66:21-67:21]**. There is no cyclic loading on the connections: Oral evidence by Glover **[T43/114:24-115:9]**; **[T44/108:23-109:5; 121:1-9]**.

[143] Glover's Report at §8.10 **[ER1/6/12-13]**; Southward Report at §17 **[ER1/5/53]**; McQuillan's Report at §126 **[ER1/3/49]**.

[144] This is part of the implementation of the MTRCL's Holistic Proposal for Verification & Assurance of As-constructed Conditions and Workmanship Quality of the Hung Hom Station Extension (Rev B) **[B20/26099-26136]**. **[OU1/OU4]**

[145] **[G20/G15039]**.

structural safety, 6 threads (or 24~26mm) engagement should be the criterion employed[146]:-

(i) The BOSA Seisplice System Thread Strength Calculation Table[147] gives a verified pass criterion of 22mm (5.5 threads x 4mm pitch) as an absolute minimum to achieve full rebar tension and 24mm (6 threads x 4mm pitch) to give a safety factor of 1.14. Therefore, based on the calculation for complete threads with full integrity, the number of threads that is required to achieve the specified tensile strength is 6 (or 24mm). This was confirmed by BOSA's lab tests, which were witnessed by BD representatives[148].

(ii) Further, as McQuillan highlighted, the actual stress levels in the EWL slab and rebar at the D-wall connections (based on the low utilisation rate) are relatively low. Accordingly, 6 threads engagement is already a conservative criterion in terms of structural safety[149].

80. There is a clear, but vitally important, distinction between compliance and safety. This CoI is concerned with safety and fitness-for-purpose. Accordingly, the CoI should approach these opening up results by reference to the test criterion for safety, not technical compliance[150]. In other words, the criterion as endorsed by McQuillan, Glover and Southward should be adopted (i.e. 6 threads).

81. Au attempted to challenge BOSA's calculation and tests[151]. However:-

(i) Au has not carried out any calculation or test to support such a challenge.[152]

(ii) BD witnessed the tests without objection, but would have objected had they

---

[146] McQuillan's Report at §§119-125 **[ER1/3/47-49]**; **[T42/136:20-25; 153:7-21]**; **[T43/119:4-10]**.
[147] **[H25/44527.1]**.
[148] **[H25/44520-44526];** As Southward rightly stated "*We've seen a test and it's been tested and we know it's strong enough. So that's what I mean. If we have 60 per cent engagement, that's what happens, so we know the structure is then safe.*" [**T43/61:7-11]**.
[149] [**T44/101:23-102:15].**
[150] [**T44/35:4-16].**
[151] Au's Report at §2.5 **[ER1/7/5]**; [**T40/39:17-40:25; 43:7-44:5]**; [**T41/3:18-4:7; 7:18-8:19; 22:1-9].**
[152] [**T41/8:20-9:23; 22:10-12; 28:1-5].**

considered there was any invalidity with the testing procedure[153].

(iii) Au also queried whether the tests were on Grade 460 (which according to Leighton was used up to around May 2016[154]) or Grade 500 rebar, whilst agreeing that if Grade 500 was used, instead of Grade 460, one would get an even better result in terms of strength.[155]

82. Glover compellingly explained that elongation test was irrelevant to structural integrity. The test involves pulling the coupler at a high level of stress and measuring the elongation, to test a particular component as to whether it does what it should do and "*it is an error to then extrapolate that into what happens in the structure"*. McQuillan also agreed with this and noted that because of the utilisation values of the structure, they are never going to strain to 0.1 of a millimeter[156].

83. Of the latest opening up results, on the basis that 6 threads (i.e. 24mm ~26mm) engagement represents safety, as of 21 January 2019 there are *only* three results that can be regarded as "*failures*":

(i) One defective top coupler was found at EH44 with an engagement length of 6.22mm (9-10 exposed threads)[157]. In McQuillan's view, if this is an isolated incident (which it is based on current evidence) and there are no adjacent rebars similarly compromised, the coupled joint can be left as is or welded. McQuillan further highlighted that given that there are only a limited number of D-wall panels where couplers were retained on the top rebar layer of the EWL slab, the potential for finding similar defects is small[158].

(ii) Two defective connections were found in the EWL slab soffit at EH107

[153] [**T41/21:2-6; 25:15-23; 85:7-19].**
[154] [**T44/200:10-14].**
[155] [**T41/4:3-15].**
[156] [**T44/42:12-45:16; 105:12-107:20].**
[157] Item 5 of PAUT Preliminary Result (as of 21 January 2019) **[OU454]**
[158] McQuillan's Report at §§120-121 **[ER1/3/47-48]**; Glover Report at §7.1-7.3 **[ER1/6/9-10]**

and at WH113 with engagement lengths of 9.40mm (6-7 exposed threads) and 20.86mm (7-8 exposed threads) respectively[159]. However, the coupled rebar at the bottom mat of the EWL slab is always in compression and the coupler and bar are redundant[160], so the structure is safe.

(iii) *All* SE Experts agreed that given the redundancy of the couplers in the bottom of the EWL slab, further opening up of the soffit is unnecessary and the focus should be directed to the top of the east D-wall to verify the as-built drawings and the details which are of structural significance[161].

84. Importantly, the results are not suggestive of any systematic/large scale threaded rebar cutting. In this regard, McQuillan helpfully prepared a spreadsheet re-organising the data into three relevant groupings (i.e. embedded length, length of bar end and engaged length). Based on his analysis of the results of the PAUT readings, McQuillan concluded that there is generally no indication of threaded rebar cutting[162]. The available evidence and opening up results mean the likelihood of a large number of failed couplers concentrated in one location is "*extremely remote*"[163].

85. Some of the PAUT results may suggest that the threaded portion of the rebars may be a few millimeters shorter than the usual length of a Type A rebar[164]. It is inconceivable that anyone would cut short a Type A threaded rebar by just a few millimeters. Not only is there no purpose served[165], but it is also difficult to perform such cutting. A probable explanation for this is that workers may have taken a Type B threaded rebar and cut it short to serve the purpose of a Type A threaded rebar, which while not recommended is technically possible.[166] This

[159] Items 22 and 98 of Phased Array Preliminary Result (as of 21 January 2019) **[OU454]**
[160] McQuillan's Report at §122 **[ER1/3/48]**; **[T43/138:24-139:15]**
[161] JEM at §6 **[ER1/3/122]**
[162] **[ER1/3.2]**; **[T44/99:22-101:6]**
[163] [**T44/31:7-33:2]**
[164] see e.g. item 21: 35.34 mm (+/- 3mm tolerance)
[165] If the worker were to cheat, he may better off cutting a more significant portion
[166] [**T36/116:15-20]**

would produce the odd results in the opening up exercise. Another possible explanation may simply be the potential unreliability of the PAUT, the accuracy of which McQuillan doubted[167].

86. Overall, Glover concluded that the evidence supporting the structural adequacy and safety of the construction means there is little case for further opening up the structure since sufficient samples have already been obtained to statistically gain confidence that such widespread/wholesale illegal cutting has not taken place[168]. This, of course, is consistent with the factual evidence.

## IV(iv) New coupler installation criterion that came up during the course of the opening up exercise

87. In Au's oral synopsis, he referred to BOSA's letter to BD dated 7 January 2019[169] and contended that 10 full threads are supposed to be engaged and it should be tightened so that the bars are "*butt-to-butt*", otherwise the assembly may be considered loose[170]. The Chairman rightly noted this letter was written in January 2019, by which stage this whole thing had "*blown up*", that anyone would make sure their position is secured as far as possible in law, that it was a defensive letter and that little weight should be attached to it[171]. The Chairman observed that the purported "*butt-to-butt*" requirement was new to the present proceedings and did not appear until during the oral evidence of the SE Experts in the week of 14 January 2019.[172]

88. MTRCL has raised concerns with the shifting focus of the CoI. Originally, the two most important matters that the CoI was concerned with were the issue of cut rebar and the change in connection detail, which remained the focus for a large part of

[167] [**T44/98:23-99:20]**; see for example the odd result at item 98 of the PAUT preliminary results (as of 21 January 2019) **[OU454]**, which suggests that the coupled rebar at that location has a threaded length of 51-55mm (20.86mm engagement length + 7-8 exposed threads (4mm per thread) + 2mm chamfer), *i.e.* a Type B rebar.
[168] Glover's Report at §10.5 **[ER1/6/14]**; [**T43/140:16-141:8]**
[169] **[H26/45640].**
[170] [**T40/30:3-14]**; [**T41/62:2-66:14]**; Similar argument by Yeung **[T41/144:9-16].**
[171] **[T42/48:7-22].**
[172] [**T42/89:13].**

the hearing. It was against those two matters that issues of safety were to be considered.

89. However, the CoI was then told about the opening up, which was directed initially at establishing only the extent of the cut rebars and whether the connection detail was in accordance with Leighton's and MTRCL's as-constructed drawings. The current situation is that the safety of the structure is now being determined (at least so far as Government and China Technology is concerned) by reference to the opening up exercise and, in particular, whether rebars satisfy the purported "*butt-to-butt*" requirement. The problem with this is that none of these matters were investigated in the factual evidence e.g. whether BOSA gave instruction courses to the workers wherein direction was given that rebars had to be "*butt-to-butt*" (not accepted by MTRCL) and how that impacts upon the evidence on surveillance and inspection.[173]

90. MTRCL reserves its position so far as this new development is concerned. However, as a minimum it is submitted that insofar as the CoI is considering making any finding which impacts on MTRCL in relation to these "*new matters*", as a matter of fairness a proper opportunity ought to be afforded to MTRCL to test any evidence that may be produced against it by *inter alia* producing its own relevant evidence. In the current circumstances, the CoI may consider that BOSA should be made a party to the Inquiry so that the purported "*butt-to-butt*" requirement can be properly interrogated. Without prejudice to the foregoing, MTRCL makes the following submissions regarding the issue of "*butt-to-butt*".

91. The only reference made in the QSP to "*butt-to-butt*"[174] states that "*BOSA CNC threading machines are always programmed by default to allow a positive tolerance on the thread length. This is to ensure butt-to-butt connections can always be achieved when the rebars are spliced inside the coupler*". It is submitted

[173] [**T42/86:10-88:11].**
[174] **[H9/4280].**

that these sentences are at best a manufacturing specification to ensure butt-to-butt connections *can* be achieved, rather than mandatory requirements that such connections *must* be achieved in coupler installations. Further:-

(i) BOSA's Manual contains *no* requirement for a "*butt-to-butt*" connection in the instructions for proper coupler installation for Type A threaded rebars.

(ii) In BOSA's Manual it is stated that "*After connection has been fully tightened, one should see a maximum [tolerance] of two full threads to ensure a proper installation*"[175]. The concept of tolerance accords with Glover's experience that "*all bolts, all screwed threads are designed to have a level of percentage which is less than 100 per cent…this idea of lack of 100 per cent engagement is not a new issue*"[176]. This is precisely the basis on which MTRCL's inspectors based their visual inspection on[177].

(iii) Contrary to Yeung's contention that the "*tolerance*" stated in the BOSA Manual refers to the threading process (i.e. namely BOSA may produce threaded rebars with up to 12 threads)[178], it is clear from the evidence that a Type A threaded rebar has 10 or 11 threads[179]. Accordingly, if a maximum of 2 threads showing is acceptable and there are 10 or 11 threads on the rebar, only 8 (32mm) or 9 threads (36mm) are required be engaged.

(iv) As the Chairman noted, if a "*butt-to-butt*" connection was vital or necessary to ensure integrity, it would have been stated as an instruction so that workers on site would know[180]. In fact, Andy Wong's clear evidence is that he conducted his visual inspection of the coupler assembly to see if there would be an over-exposure and he operated with the understanding that

---

[175] [**T41/178:14-179:2].**
[176] [**T43/87:22-88:11].**
[177] [**T30/142:10-17**]; **[T42/19:11-19].**
[178] [**T41/179:9-181:17].**
[179] BOSA Seisplice System Thread Strength Calculation Table **[H25/44527.1]**; Paulino Lim **[T37/99:23-100:3]**; Chairman's conclusion that there are ten threads on threaded rebar samples after counting **[T41/182:2]**; Yeung **[T42/22:22-25].**
[180] **[T42/31:6-19**; **38:6-12].**

there should be at most one or two threads exposed, and Au conceded that he likely had the tolerance stated in the BOSA Manual in mind[181].

(v) As Yeung sensibly conceded, from a practical standpoint when construction workers are tightening rebars into a coupler, there is no way they can guarantee that they achieve "*butt-to-butt*" (as there could be debris in the coupler which gave the impression that "*butt-to-butt*" has been achieved)[182].

(vi) This would have required inspectors to conduct PAUT or similar testing on each coupler connection to ensure "*butt-to-butt*" is achieved, which is not practical on a construction site.

92. Therefore, it is submitted that there was no requirement during the course of the works for "*butt-to-butt*" connections to be achieved to ensure safety.

## IV(v) Ancillary matters

93. Apart from any defective coupler connections, various minor defects or alleged defects have been raised and addressed during the course of the CoI: namely: (1) water leakage through the D-walls; (2) misaligned shear links; (3) the alleged use of "*lightweight*" concrete as backfill in Area A; and, (4) honeycombing. None of these ancillary matters, to the extent that they exist, pose any safety concerns whatsoever so far as the public (or anyone else) is concerned.

### IV(v)(a) Water leakage through the D-walls

94. As noted in MTRCL's opening submissions, the D-walls were built to comply with the stringent requirements of Contract 1112. A D-wall is an underground structure and is technically difficult to achieve full watertightness, as recognised by MTRCL's Materials and Workmanship Specification for Civil Engineering Works[183].

[181] **[T30/142:12-17; T42/19:11-24].**
[182] [**T42/28:4-13; 31:20-34:11].**
[183] Section 19.77 **[B16/12548]; [T2/22:10-24:25].**

95. McQuillan also noted that despite allegations of water ingress through the D-walls, just one damp area was observed at a joint between two panels on the east D-wall above the lower NSL slab level. Any instances of through-seepage were successfully remedied by pressure grouting in the normal manner. McQuillan is firmly of the view that there is no evidence of any structural or serviceability problems with the D-walls and the only instance of dampness is well within the specified tolerance level.[184]

**IV(v)(b) Misaligned shear links**

96. On 27 September 2018, MTRCL issued NCR 266 to Leighton[185], which concerned the non-compliance of the anchorage and spacing of as-built shear reinforcement for the EWL slab with the construction drawings/ contract requirement. While as part of MTRCL's Louis Kwan's formal inspection he conducted spot-checks of the vertical shear links, this was not discovered until September 2018[186]. As explained by Man Sze Ho, this may be because the shear links, which were fixed at certain spacings, were dislodged or moved in position during the concreting process since they were not secured by way of a wire but were just hooked onto the bar[187].

97. Nevertheless, it is noted that *all* the SE Experts clearly and unequivocally agreed that the misaligned shear links "*was of no structural significance in the context of slab rebar*"[188]. McQuillan further explained that the "*links are active over the greater part of their length and the areas are over-reinforced because of the significant rebar lapping*"[189]. Accordingly, such defect does not pose any safety

[184] McQuillan's Report §§86, 105 **[ER1/3/36, 44]**.
[185] **[H19/39704].**
[186] **[T29/61:22-63:5].**
[187] **[T22/43:12-23].**
[188] JEM at §4 **[ER1/3/121].**
[189] McQuillan's Report at §110 **[ER1/3/45]**; *see also* Glover Report §§11.5-11.6 where Glover noted that "*in many cases the links were provided as an extra precaution because of concerns about the uncertainties associated with construction loadings…However, in its post-construction loading condition and shorter spanning arrangement, the stresses in the structure have now generally reduced. As a result, I would expect the required extent of shear*

concerns whatsoever.

**IV(v)(c) Alleged use of lightweight concrete as backfill in Area A**

98. Jason Poon alleged at a special meeting of the Subcommittee on Matters Relating to Railways of the Legislative Council on 13 July 2018 that MTRCL had used lightweight concrete to backfill Area A[190]. This bare, untrue assertion was not substantiated at all. Mass concrete (the same type of concrete as the concrete to be poured) was used for backfilling in Area A in the space between the in-situ wall and the D-walls on the NSL level[191]. Leighton used some recycled dense concrete at the very bottom and topped it up to the requisite level using normal dense concrete. As McQuillan concluded, this "*did not alter the structural dead weight and therefore did not compromise the resistance to floatation*"[192].

**IV(v)(d) Honeycombed concrete at the soffit of the EWL track slab**

99. In or around August 2016 when both the EWL and the NSL slabs were completed, MTRCL began the process of checking the EWL/NSL slabs and the D-walls for snags and defects. During the snagging process, instances of honeycombed concrete were identified at the soffit of the EWL slab in late 2016, which was a snag/defect attributable to China Technology's inadequate workmanship. The identified snags/defects were subsequently rectified, and no honeycombing was observed during the post-pour snagging process[193].

100. In addition to the ongoing snagging process, pull out tests and core tests at the EWL and NSL slabs have been carried out. The results indicated that no honeycombing existed at the pull out or core sample locations in the EWL and

*links to be much reduced to the extent that share reinforcement is not generally required, except in localized areas*" **[ER1/6/15-16].**

[190] English Translation of HK01 Article dated 13 July 2018 **[A1/85-88].**

[191] James Ho's 1st Witness Statement at §§98-100 **[B1/353].**

[192] McQuillan's Report at §87 **[ER1/3/36-37].**

[193] Michael Fu's Reply Witness Statement §§7-11 **[B16/13680-13681]**; Kobe Wong's Reply Witness Statement §§17-24 **[B16/13667-13669].**

NSL slabs.[194]

101. In the course of preparing and finalising the proposed load test, MTRCL had to identify potential locations at the soffit of the EWL track slab for the anchoring of the load test equipment. During this exercise, MTRCL and Leighton's site staff observed suspected poor concrete quality at the EWL slab soffit. Upon removing the loose/suspected defective concrete on the soffit surface and inspecting those locations up close in August 2018, MTRCL identified poor concrete quality concealed above the soffit surface. Consequently, MTRCL issued four NCRs to Leighton to formally record the poor quality concrete observed on site, and in order to request Leighton to submit a formal remedial proposal for the rectification of the defects[195].

102. As to the cause of honeycombing, Glover explained that with the concentration of reinforcement, "*whoever was responsible for casting the concrete should have used a smaller aggregate and should have used a super-plasticiser, and they didn't, and that has certainly contributed to the honeycombing*"[196].

103. All the SE Experts (save for Southward - as it was not part of his brief) have unreservedly agreed that the "*miscellaneous workmanship issues e.g. spalling, voiding, gap etc. were all repairable*"[197]. Leighton has already engaged a specialist sub-contractor to remedy the poor concrete quality identified on site[198].

104. As McQuillan observes, where honeycombing was discovered, the defective concrete has been removed and a repair strategy is being formulated. Where honeycombing has been removed and the bottom steel has been exposed, the rebars have lost bond and therefore some dead load capacity. In McQuillan's view, "*the reserve capacity of the EWL slab will allow for this but it will be necessary to*

[194] Michael Fu's Reply Witness Statement §§12-19 **[B16/13682-13683].**
[195] Michael Fu's Reply Witness Statement at §§20-22 **[B16/13683-13684]**; Corrigendum to Michael Fu's Reply Witness Statement **[B16/13686.1]**
[196] [**T44/54:17-55:7; 56:6-58:2].**
[197] JEM at §4 **[ER1/3/121].**
[198] Michael Fu's Reply Witness Statement at §29 **[B16/13686].**

*carry out a re-analysis on completion of the repair work*" [199]. Further, Glover noted that "*the lapped bars in the zone of honeycombing have become de-stressed…the structure has low strength utilisation level, that the most critical loading and span situation had passed, and that the load has been redistributed to adjacent areas.*"[200] i.e. the concrete defects do not cause any structural safety issue.

105. Accordingly, it is perfectly clear from the evidence that none of these minor defects or alleged defects pose any safety concerns, so the structure is *safe*. As Glover forcefully put it, "*the construction, really, of that station should be allowed to continue, because when you think about it, every day you are denying society an asset that it can use. Why? There's physically no reason from a technical point of view why you can't do that.*"[201]. Further, all experts agreed that any remaining public safety concerns can be allayed by maintaining long term monitoring of the structure[202].

## V. THE PM EXPERTS' VIEWS AND AGREEMENTS CONCERNING MTRCL'S PROJECT MANAGEMENT SYSTEMS AND MEASURES

106. The PM Experts had agreed "*on nearly all the major project management issues*"[203]:

> *"6. We agree that MTRCL's overall project management obligations are defined and set forth in the Entrustment Agreement (EA3), MTRCL's PMP, PIMS, BD's Instrument of Exemption, BD's Code of Practice for Site Supervision 2009, the contract documents between MTRCL and Leighton and the Quality Supervision Plan for coupler installation as per BD's Acceptance Letters.*
>
> *7. We agree that MTRCL has a thorough knowledge and understanding of its responsibilities and duties associated with delivering the Entrustment Activities for a project of this magnitude and complexity.*
>
> *8. We agree that the PIMS is defined in the PMP and includes*

[199] McQuillan's Report at §§83, 109 **[ER1/3/3, 45].**
[200] Glover's Report at §11.3 **[ER1/6/15].**
[201] [**T43/125:12-16].**
[202] JEM §5 [**ER1/3/122**].
[203] **[ER1/9/T-1]**

*manuals, procedures and practice notes and provides a robust basis for the development and implementation of project specific plans.*

*9. We agree that the PIMS is accredited with ISO 9001* [204] *and the PIMS undergoes periodic internal review and external audits to ensure it stays up to date to serve its purpose in the management of railway projects."*

107. In addition, the JSPM records the following recommendations:

> *"10. We suggest that certain improvements can be made to the PIMS as follows:*
>
> *a. Review the PIMS manuals and identify any broad language that can be converted into project specific information.*
> *b. Review and refresh the older documents in the PIMS system.*
> *c. Consider opportunities to rationalise or combine documents to reduce the overall numbers to which practitioners have to refer.*
> *d. It would be desirable to be more specific about which PIMS manuals are applicable to a project and job roles rather than just including a long list of all PIMS documents.*
>
> *11. Whilst we are not fully agreed about the adequacy of the Project Management Plan, we do agree there is room for improvement, and additional modifications can and should be made. Our suggestions for improvement include:*
>
> *a. Consideration should be given to preparing a cross-referencing system between the PMP and the PIMs to help identify the roles and responsibilities of the various staff members, including contractual roles and responsibilities.*
> *b. Review and improve the detailed content of the PMP, to make them more comprehensive and relevant to the project by translating generic guidance into project specific requirements.*
> *c. Consider the inclusion in the PMP of proposals for any project partnering arrangements and initiatives."*

108. The above recommendations stem from the fact that the PMP and PIMS were never projects specific. Therefore, on complex projects such as Contract 1112, MTRCL accepts that it would be helpful to provide further instructions on how to use these documents and, in addition, to add more project specific data. By refreshing and augmenting the PMP and PIMS procedures additional transparency and enhancement of the current project management procedures will

[204] Rowsell's Report at §26.

be provided.

109. MTRCL has already implemented or is in the process of implementing the recommendations which are referred to in paragraph 107 above[205]. Whilst there is always room for improvement, one must not lose sight of the robustness of MTRCL's project management processes and controls. Indeed, the PM Experts agreed that *"it is common that some mistakes or oversights will inevitably be made in the performance of the works of such scale and complexity"* [206].

110. Nevertheless, as the PM Experts pointed out, *"procedures should be in place to mitigate errors and enable the works to be executed in a professional manner"*[207], and MTRCL accepts this. With this in mind, MTRCL will address the inaccuracies in the June Report and the associated areas for improvement.

## VI. ISSUES ARISING FROM THE JUNE REPORT

111. The media reports alleging defective coupler installations and rebar fixing works appeared on 30 May 2018[208], and upon the request of RDO on 31 May 2018[209], MTRCL set about preparing the June Report[210].

112. As stated in MTRCL's oral opening submissions, "*MTR had to produce a report very quickly and indeed did so on 15 June 2018 under considerable pressures of time […] in just two weeks*", and this was "*at the same time as there were still substantial ongoing works*"[211].

113. In very broad terms, the preparation of the June Report involved, amongst other things, ascertaining the total number of couplers within the whole of the EWL slab; and, reviewing the records available to confirm that an adequate level of

---

[205] T&T's 38 recommendations are summarised in Appendix A of MTRCL's Memo dated 3 January 2019 which is appended to Huyghe's Report [ER1/2/Appendix D]

[206] See also TM Lee's oral evidence at **[T32:16:4-18:18]**.

[207] Paragraph 5 of JSPM. **[ER1/9/T1]**

[208] **[A1/A32-A40]**; **[A1/A48-A51]** (English translations: **[A1/A41-A47]**; **[A1/A52-A53]**).

[209] **[B10/B7644-B7645]**.

[210] **[B1/B1-B46]**.

[211] **[T2/18:5-12]**.

supervision and inspection was provided by MTRCL.

114. In relation to ascertaining the total number of couplers, both MTRCL and Leighton took part in the exercise:

(i) James Ho explained that the CM team carried out the exercise using the as-built drawings for the D-walls and the estimate provided by Leighton.[212]

(ii) Clement Ngai explained that the DM team was also instructed to confirm the CM team's estimate, again by using the as-built drawings for the D-walls[213].

(iii) Rooney pointed out that MTRCL and Leighton reconciled their figures[214].

(iv) It was based on this rushed exercise that the June Report stated at paragraph 5.3.1.7 that "*[i]n accordance with the design accepted by BD, the total number of couplers connecting the EWL slab to the east and west diaphragm walls was approximately 23,500*"[215].

115. As for confirming the level of supervision and inspection, the CM team reviewed the available records pertaining to the EWL slab:

(i) In a limited time, the CM team obtained and reviewed, amongst other things, the contemporaneous RISC forms recording the inspection of the rebar fixing works and the pre-pour checks in respect of all 32 bays of the EWL slab[216].

(ii) As Rooney explained, his understanding was that the RISC forms confirmed that the couplers were checked, and he genuinely trusted his IOWs and ConEs who were all experienced professionals[217]. Therefore,

---

[212] **[T27/3:5-5:9]**; paragraph 72 of the statement of James Ho **[B1/B345]**.

[213] **[T25/69:11-73:13, 76:8-13]**; paragraph 75 of the statement of James Ho **[B1/B346]**.

[214] **[T28/37:6-12, 66:3-7]**.

[215] **[B1/B24]**; see also paragraphs 91 to 97 of the statement of Rooney **[B1/B211-B212]**.

[216] **[H1/H38-H406]**.

[217] **[T28/81:19-25]**.

what MTRCL had to do was to substantiate internally that 20-50% of the couplers were inspected as per the requirements in the QSP[218] and BD acceptance letters[219], and for that purpose coupler checklists[220] were prepared in June 2018[221].

(iii) Based on the contemporaneous RISC forms and the exercise carried out by the CM team, the June Report at paragraph 5.3.3 expressed the understanding at the time that "*[a]ll inspection records indicated that the works were acceptable, with no anomaly*"[222].

116. Unfortunately, and certainly with no intention to mislead, in the course of preparing the June Report and the coupler checklists, the CM team did not take into account the Second Change, which meant that there were less slab-to-wall couplers connections. As explained in MTRCL's oral opening submissions, this issue "*finally came to light when MTR's construction management team reviewed site photographs […] together with other related information, in or around July 2018*"[223].

117. It is regrettable that the CM team did not take into account the Second Change during the preparation of the June Report, but it bears emphasis that this was an inadvertent product of *five extenuating factors*:

(i) The June Report was prepared under immense time pressure, at the same time when the CM team was attending to its daily tasks and challenges in respect of the ongoing works on Contract 1112.

(ii) The June Report dealt with events which occurred some three years previously, and this required the search for and collation of a large volume

[218] **[B5/B2640-B2658]**.
[219] **[H9/H3871-H4053]**.
[220] **[B7/B4537-4598]**.
[221] **[T28/28:23-31:10; 33:6-14]**.
[222] **[B1/B29]**.
[223] **[T2/21:16-22]**.

of information and records from 2015/2016.

(iii) The change in connection detail was considered at the time of the construction of the EWL slab to be a minor change, particularly in the light of many other more pressing issues (e.g. underpinning works) which the CM team had to deal with on a daily basis[224].

(iv) At the time, the "*biggest focus was, from everyone's perspective, on trimmed bars and the background to the trimmed bars and what records there were related to the trimmed bars*"[225].

(v) Above all, MTRCL simply "*didn't have enough of the team that was originally involved in the construction involved in that period from the end of May through to the 15th, to be able to recall clearly and to point out that this change in construction detail had occurred*"[226].

118. Therefore, it is understandable that something was missed during the process of preparing the June Report. In any event, MTRCL put its 'hand up' to the issue once it was known, as demonstrated by its letter dated 13 July 2018 to the RDO based on the information available at that time[227].

119. In MTRCL's submission, the June Report inaccuracies can be traced back to four aspects of project management with room for improvement, namely: (i) Hold point inspections and RISC forms; (ii) MTRCL's supervision and inspection of coupler installations; (iii) Contemporaneous record-keeping for coupler inspections; and (iv) Management of change in connection detail and as-built records.

[224] Paragraph 73 of the statement of James Ho **[B1/B345-B346]**; TM Lee at [**T32/16:4-18:18]**.

[225] See Rooney's oral evidence at **[T28/83:15-21]**.

[226] See Rooney's oral evidence at **[T28/83:3-12]**.

[227] **[B1/B69-B73]**.

## VI(i) Hold point inspections and RISC forms

### VI(i)(a) Factual evidence on hold point inspections

120. The CoI has heard extensive evidence relating to hold point inspections:

(i) As a starting point, Rooney confirmed during the hearing that the rebar fixing works in each bay were inspected by MTRCL and Leighton on a layer-by-layer basis during routine site surveillance[228]. This is consistent with the evidence of Fang Sheung's Cheung Chiu Fung (foreman)[229] and Leighton's Edward Mok (Graduate Engineer)[230]. The pre-pour check was a further hold point involving a thorough check of all rebars, formwork and cast-in items[231].

(ii) The rebar fixing works for each bay of the EWL slab were hold points under the ITPs[232], and the top and bottom rebar mats in each bay were inspected on two separate occasions and covered by a single RISC form[233].

(iii) Louis Kwan, a grade T3 TCP under the CP stream[234] and a ConE II[235], explained that occasionally he received advance copies of the RISC forms[236] or a WhatsApp message or call from Leighton,[237] notifying him that the top or bottom mat in a given bay was ready for inspection. This is consistent with his evidence that Leighton "*was often late with its paperwork and submitted the RISC forms after the relevant works had*

[228] **[T28/15:17-17:10]**; **[T29/58:5-59:13]**.

[229] **[T14/75:8-10]**.

[230] **[T21/19:12-18]**.

[231] **[T28/17:11-19:18]**.

[232] See the ITPs referred to in paragraph 15 of the statement of James Ho **[B1/B325]**.

[233] Paragraph 48 of the statement of Louis Kwan **[B1/B388]**.

[234] Paragraph 12 of the statement of Louis Kwan **[B1/B376]**, which refers to the SSP at **[H10/H4507-H4528]** as an example.

[235] Louis Kwan inspected the rebar fixing works in Areas B and C except bays C3-2 and C3-3: see paragraph 47 of the statement of Louis Kwan **[B1/B388]**.

[236] **[T29/2:8-19]**.

[237] **[T29/14:9-12]**.

*already been completed*"[238].

(iv) Nevertheless, the unchallenged evidence of Louis Kwan is that the hold point inspections for rebar fixing works were all carried out by reference to the working drawings, and typically, the spacing of the rebars, the number of layers of rebars, the lap length of the lapped rebars and the diameter of the rebars would be spot-checked.[239]

(v) As summarised by the Chairman, the crux of Louis Kwan's evidence is that in each and every bay for which he signed-off a RISC form, he inspected both the bottom and top mats of the rebars on a spot-checking basis, and whatever problems there might have been in those bays had been checked and rectified[240]. This is notwithstanding the fact that the actual inspection dates of the top and bottom mats are unclear on the face of the RISC forms.

(vi) On any count, Louis Kwan's evidence that he is "*confident that the top and bottom layers of rebars have both been inspected on a spot-checking basis, in order to ensure that they had been properly fixed […]*"[241] has not been doubted or challenged.

121. To be clear, MTRCL acknowledges Louis Kwan's evidence that the hold points and RISC forms which he signed off were only related to the top and bottom mats of rebars and not the inspection of coupler connections specifically[242]. This does not mean that MTRCL's inspectorate staff did not otherwise carry out sufficient site surveillance and inspection of the splicing assemblies[243].

122. As far as the rebar fixing works in the EWL slab are concerned, it is clear from the factual evidence that those works were properly inspected at the relevant hold

[238] Paragraphs 49 to 50 of the statement of Louis Kwan**[B1/B389]**.

[239] Paragraphs 52 and 55 of the statement of Louis Kwan**[B1/B389-B390, B392]**.

[240] **[T29/14:13-23]**.

[241] Paragraph 50 of the statement of Louis Kwan **[B1/B389]**.

[242] **[T29/20:20-21:12]**.

[243] This will be addressed as a separate topic in Section VI(ii) below.

points. That said, the fact that the hold points were not clearly defined to cover the inspection of coupler installations led to some confusion within the CM team as to the division of labour, and this contributed to the inaccuracies in the June Report. In this regard, the recommendations of the PM Experts are pertinent.

**VI(i)(b) Observations of the PM Experts**

123. In respect of the inspection of the rebar fixing works in the EWL slab, Huyghe specifically noted that the "*informal layer by layer inspections were part of a wider system of routine inspection carried out by both MTRCL and Leighton personnel and also involved formal RISC inspections at hold points*"[244]. He also stated that:

> "*It appears that the RISC checks, when executed and documented properly, were comprehensive, albeit sometimes late. The RISC checks process seems to follow a systematic approach for inspecting the work. The inspections were witnessed by Leighton, properly documented, and not performed in a haphazard or random fashion.[…]*"[245]

124. Both PM Experts agreed that "*if the bottom layers of the rebar are obscured by the subsequent top layers, then an individual inspection by layer (or by mat) should have been performed*"[246]. In particular, Huyghe pointed out that "*the inspection of the bottom mat would require a separate inspection and a sign off procedure*" [247]. MTRCL accepts that this is an area for improvement and welcomes the said recommendations which will be implemented[248].

**VI(i)(c) Improvement measures already taken by MTRCL**

125. Huyghe and Rowsell pointed out that [249] many of their recommendations essentially replicates T&T's recommendations[250] which MTRCL has already

---

[244] Paragraph 185 of Huyghe's Report **[ER1/2/45]**.

[245] Paragraph 169 of Huyghe's Report **[ER1/2/42]**.

[246] Paragraph 17 of the JSPM **[ER1/9/T-3]**.

[247] Paragraphs 199 to 200 and item 11 of Table 3 of Huyghe's Report **[ER1/2/48; 78]**; paragraphs 173 and 195 of Rowsell's Report **[ER1/1/82-83;85]**.

[248] See Carl Wu's oral evidence at **[T31/74:1-22]**.

[249] Paragraph 57 of Huyghe's Report **[ER1/2/19]**; paragraph 200 of Rowsell's Report **[ER/1/86]**.

[250] **[B17/B24421-24476]**.

taken proactive steps to implement.

126. The relevant improvement measures already adopted by MTRCL are set out in item 11 of Table 3 of Huyghe's Report, and the updated memorandum from Stephen Hamill confirming the latest developments to which the CoI is referred[251].

## VI(ii) MTRCL's supervision and inspection of coupler installations

### VI(ii)(a) The interpretation of "quality supervision"

127. The QSP was prepared by Leighton/BOSA and submitted by MTRCL to the BD by a letter dated 12 August 2015.[252] The QSP appended BOSA's technical manual for the installation of couplers prescribing the quality control/assurance scheme therefor.

128. Section 5 on "*Supervision on Site Works*"[253] requires MTRCL's quality control supervisors to have the same "*minimum qualification and experience*" as a grade T3 TCP.[254] MTRCL's inspectors were suitably qualified in that regard e.g.:

(i) Kobe Wong (IOW until November 2015, and thereafter SIOW II until March 2018) was in fact assigned under the SSPs as a T3 TCP[255] for the RGE stream[256] in respect of the D-walls works and the excavation and lateral support works at EWL track level.[257]

(ii) Andy Wong (AIOW) has previously been a T3 TCP on another site and is also suitably qualified.[258]

129. The meaning of "*quality supervision*" under the QSP has been the subject of some

---

[251] See under cover of Mayer Brown letter of 22 January 2019 as per the request of the CoI at **[T40/1:17-3:8]**.

[252] **[B5/B2640-B2658]**.

[253] **[B5/B2647]**.

[254] **[B5/B2645]**.

[255] Indeed, even China Technology's Jason Poon respected Kobe Wong and agreed at **[T11/35:16-17]** that *'he has a say on acceptance under QSP'*.

[256] Jason Wong's evidence is that in principle, a quality control supervisor only needs to have the qualification and experience of a TCP T3, and it does not matter which stream he/she is under: **[T31/139:4-8]**.

[257] **[T30/112:10-16]**; see also paragraphs 17 to 18 of the statement of Kobe Wong **[B1/B421]**, which refer to the SSPs at **[B5/TS2, TS40586, TS40593]**.

[258] **[T30/121:16-18]**.

debate throughout the hearing. In MTRCL's submission, in contrast to Leighton's obligation of "*full time and continuous supervision*", the QSP contemplated the checking of 20/50% of the coupler splicing assemblies by MTRCL, and this can be achieved either by watching the rebars being screwed into the couplers or inspecting the completed splicing assemblies afterwards, or a combination of both:

(i) Leighton's Stephen Lumb (Head of Engineering) pointed out that "*splicing assemblies*" in the QSP referred to "*the finished product of coupler plus the two bars which are engaged, not the process*", and the Chairman also accepted that "*there was an obligation thereafter to check what had been done by way of the assembly*"[259].

(ii) Stephen Lumb said that "*in the context of Hong Kong supervision just means the normal daily supervision and inspection regime. It certainly […] doesn't mean that you are man-marking someone who is actually physically screwing a bar in*"[260], as it would be impractical and require ten times the number of site supervisors[261] – a view with which Huyghe and Rowsell agree[262].

(iii) Rooney similarly explained that "*the normal interpretation of that type of terminology is that both the contractor and MTR will have people full-time on site, but […] there wouldn't necessarily be somebody full-time at every location, throughout the whole working day*"[263]. He also pointed out that "*the normal situation is that the contractor will supervise, and the engineer or the engineer's representative and his team will inspect and check*"[264], because:

> "*[…] from an industry standard, it would be unusual and difficult for,*

[259] **[T25/55:11-56:17]**.

[260] **[T25/57:8-12]**.

[261] **[T25/57:5-13]**.

[262] Paragraphs 149 to 156 of Huyghe's Report **[ER1/2/] [ER1/2/8-40]**.

[263] **[T28/107:23-108:4]**.

[264] **[T28/129:19-23].**

*let's say, the MTR inspectors to supervise individuals on site to carry out work, because there isn't -- the responsibility line is not there for an inspector to supervise a worker. […]*"[265]

(iv) Therefore, as summarised by James Ho, the QSP only required that:

"*[…] when we do our 20 per cent or 50 per cent inspection, that means we don't have to stand there full-time […] looking at the rebar fixers screwing in that rebar into the couplers. […] But what we have to do is to check afterwards, after they complete the installation work, the remaining pitch, 1 to 1.5 pitch, remaining, that's there, that's equivalent to, you know, the rebar is actually screwed in, in the couplers.*"[266]

130. The foregoing evidence is very much consistent with:

(i) The opinion of the PM Experts, who both agreed that supervision is not "*man-marking*", and that "*the obligation on MTRCL was to supervise at least 20% of the splicing assemblies*" [267] . As Huyghe observed, "*[s]upervisors and inspectors do not watch every installation as long as they schedule their inspections properly and can verify that the work is being installed properly*".[268]

(ii) The legal principles relating to the supervisory duties of a contract administrator or architect, which are instructive given that there is a close (albeit imperfect) analogy with MTRCL's role - see **McGlinn v Waltham Contractors Ltd** [2008] Bus LR 233 (TCC) at [218]:

"*(a)* ***The frequency and duration of inspections should be tailored to the nature of the works going on at the site from time to time****: see Corfield v Grant 29 Con LR 58 and Jackson & Powell, at para 8–240. […]*

*(e) However, even then,* ***reasonable examination of the works does not require the inspector to go into every matter in detail; indeed, it is almost inevitable that some defects will escape his notice****: see East*

[265] **[T28/130:19-25]**.

[266] **[T27/28:12-22]**.

[267] Paragraphs 26 to 27 of the JSPM **[ER1/9/T-4]**.

[268] Paragraph 152 of Huyghe's Report **[ER1/2/39]**; see also his oral evidence at **[T39/43:2-20; 54:9-55:7]**, and Rowsell's oral evidence at **[T39/145:9-19]**.

> *Ham Corpn v Bernard Sunley & Sons Ltd [1966] AC 406 and Jackson & Powell, at para 8–239.*
>
> *(f) It can sometimes be the case that an employer with a claim for bad workmanship against a contractor makes the same claim automatically against the inspecting officer, on the assumption that, if there is a defect, then the inspector must have been negligent or in breach of contract for missing the defect during construction. That seems to me to be a misconceived approach.* ***The architect does not guarantee that his inspection will reveal or prevent all defective work****: see Corfield v Grant 29 Con LR 58.* ***It is not appropriate to judge an architect's performance by the result achieved****: see Jackson & Powell, at para 8–238."*

**VI(ii)(b) Factual evidence on MTRCL's supervision and inspection**

131. The CoI is referred to paragraphs 83 to 87 of MTRCL's opening statement[269] summarising the construction sequence and inspection process. Record-keeping will be dealt with separately but the evidence is that MTRCL did supervise and inspect the coupler splicing assemblies for the D-walls and the EWL slab.

132. First, in relation to the D-walls, MTRCL's IOWs carried out thorough site surveillance and inspection of the rebar cage and coupler installations:

    (i) Prior to the commencement of the D-walls works, the IOWs were instructed by their SIOW, Dick Kung, to supervise and inspect the coupler splicing assemblies in the D-walls.[270] At that time, Kobe Wong (who was then an IOW) referred to the QSP submitted by Leighton under CSF no. 1112-CS-LCA-CB-000007A dated 23 August 2013[271], which was applicable to the "*installation of couplers for Diaphragm wall and barrettes*"[272] – this was confirmed and not challenged at the hearing[273].

[269] See also paragraphs 28 to 30 of the statement of Kobe Wong **[B1/B426-B429]**.

[270] Paragraph 42 of the statement of Kobe Wong **[B1/B431]**.

[271] **[B5/B2659-B2675].**

[272] Paragraph 9 of the reply statement of Kobe Wong **[B16/B13659]**.

[273] **[T29/128:15-133:3]**.

(ii) Kobe Wong's unchallenged evidence is that he attended a training session hosted by BOSA in 2013, together with the relevant personnel of Intrafor and Leighton[274]. Paulino Lim confirmed[275] that "*[t]he training involved coupler installation and protection*" and going through "*QA and QC manuals*"[276].

(iii) MTRCL notes the belated suggestion by BOSA that its couplers are designed to "*ensure butt-to-butt connections can always be achieved*".[277] This is an after-thought. As mentioned above, there is no evidence that this was brought to the attention of MTRCL's inspectorate staff at the training sessions, and none of this could be tested with any of the factual witnesses – MTRCL again reserves its position in this regard.

(iv) The evidence of Intrafor's Gillard is that MTRCL's IOWs were always on site to inspect the rebar cages, and Intrafor would never install a rebar cage without a tripartite inspection having taken place.[278] Thus, his understanding is that "*100% of the cages and connections in relation to the diaphragm wall were systematically inspected by Leighton and MTR*".[279]

(v) Kobe Wong consistently explained that MTRCL's IOWs, AIOWs and Works Supervisors inspected the rebar cages and the coupler connections thereof based on the shop drawings.[280] There are comprehensive cage-by-cage records[281] of these inspections confirming that Intrafor, Leighton and MTRCL inspected the couplers connecting the rebar cages.[282]

---

[274] **[T29/121:25-122:7]**; paragraphs 22 of the statement of Kobe Wong **[B1/B422]**.

[275] **[H26/H45189-H45192]**.

[276] Paragraph A5 of the statement of Paulino Lim **[H25/H44826-H44827]**; **[T36/73:3-76:6]**.

[277] **[H26/H45853, H45858]**.

[278] **[T3/66:6-68:6]**.

[279] Paragraph 269 of the statement of Gillard **[F1/F93]**; paragraph 59 of the 2nd statement of Gillard **[F34/F19771]**.

[280] **[T29/121:15-24]**.

[281] **[F17/F11206-F33/F19741]**.

[282] Paragraph 37 of the statement of Kobe Wong **[B1/B430]**; **[T2/152:13-154:16]**.

(vi) The consistent evidence of both MTRCL and Intrafor is that all the rebar cages were systematically inspected, as a rebar cage would never be lowered into the trench without MTRCL's prior inspection.[283] This is further confirmed by the RISC forms which cover all the rebar cages for each panel.[284]

(vii) Above all, the panel records also consisted of coupler inspection record sheets[285] based on Appendix B of the QSP,[286] confirming that all coupler connections were satisfactory. As Kobe Wong explained, these were signed off by Intrafor and often also by Leighton, and a minimum of 20% of the record sheets were also countersigned by MTRCL pursuant to the QSP[287].

133. Turning to the EWL slab, the preponderance of factual evidence is that MTRCL's IOWs and ConEs did in fact carry out site surveillance and inspections in respect of the coupler splicing assemblies:

(i) The consistent evidence of Kobe Wong is that MTRCL's inspectorate staff ensured that there was quality control in respect of the splicing assemblies during daily site surveillance and inspection.[288] There was in fact proper site surveillance and inspection of the splicing assemblies, even though the IOWs did not formally understand themselves to be the quality control supervisors assigned under the QSP and so did not countersign any record sheets.

(ii) Kobe Wong "*would pay attention and look at how they carry out coupler*

---

[283] **[T3/61:1-62:19; 66:6-68:6]**; paragraphs 7.1 to 7.2 of the reply statement of Kobe Wong **[B16/B13658]**; paragraph 59 of the 2nd statement of Jean-Christophe Jacques Olivier Gillard **[F34/F19771]**.

[284] **[T3/81:2-17]**.

[285] See e.g. **[G17/G12661.310]**; these record sheets also form part of the records disclosed at **[F17/F11206-F33/F19741]**.

[286] **[B5/B2673]**.

[287] **[T29/123:11-125:13]**.

[288] **[T30/5:19-20; 76:17-22]**; paragraph 45 of the statement of Kobe Wong **[B1/B432]**.

*installation*"[289] and keep record photos,[290] and he personally "*spent a large proportion of [his] time on site doing surveillance […] from 9:30 am to 5 pm*".[291] As Kobe Wong explained, his daily site surveillance involved observing from a short distance the rebar fixers take out each rebar, remove the protective cap from the threaded end, and then successfully screw the rebar into the coupler, after which Kobe Wong would move closer to check that no more than 1 to 1.5 threads were exposed from the couplers.[292]

(iii) Importantly, Kobe Wong distinctly remembers occasions when he observed more exposed threads than usual due to the use of Type B rebars in Type A connections, and he "*asked to unscrew it to prove that it was type B*" and that the thread engagement was satisfactory.[293] Further, Kobe Wong "*did in fact direct those IOWs/AIOWs (e.g. Mr Tommy Leong) to look at the coupler installation when carrying out routine site surveillance*",[294] as corroborated by the unchallenged evidence of Henry Chan (Works Supervisor).[295]

(iv) It is noteworthy that the site surveillance and inspection process was carried out progressively, day by day, over a period of time, because coupler installations did not take place "*continuously*" *or* "*every single second*", but would only take place at specific points of the day while the rebar fixing works were carried out in a given bay.[296]

(v) Andy Wong corroborates Kobe Wong's evidence. He was full-time on site and paid attention to whether the rebars were "*properly screwed on*" during

[289] **[T30/8:11-13]**.
[290] **[T30/78:16-25]**.
[291] **[T30/22:6-12]**.
[292] **[T30/60:9-62:12]**.
[293] **[T30/81:6-82:18]**; paragraph 92 of the statement of Kobe Wong **[B1/B444-B445]**.
[294] Paragraph 60 of the statement of Kobe Wong **[B1/B435]**.
[295] Paragraphs 14 to 15 of the statement of Henry Chan **[B1/B467]**.
[296] **[T30/77:7-15; 78:16-25; 105:20-106:23]**.

daily site surveillance of Areas C2 to C3. He would watch the rebars being screwed into the couplers, "*do a visual inspection, that is to see if there would be an over-exposure of threads*", and then finally "*use my hand or use my leg to push it, to see if they were stable*".[297]

(vi) Andy Wong was at pains to stress that he did his best throughout Areas C2 and C3,[298] and like Kobe Wong, he did so as a responsible AIOW even though he was not formally assigned as a quality control supervisor under the QSP:

> "*Concerning couplers, well, it wasn't my duty, but because I'm a responsible person, I had to have oversight of everything. I did not have any checklist, but I would still check on compliance. Regarding couplers, if it's within the area I was in, I would look at them, because they were very important.*"[299]

(vii) Based on the day-to-day site surveillance activities carried out by MTRCL, Kobe Wong is confident that the coupler splicing assemblies were satisfactory, and he confirmed in no uncertain terms that MTRCL had met the requirements in the QSP and BD acceptance letters.[300]

(viii) The daily site surveillance and inspections carried out by MTRCL's IOWs, AIOWs and Works Supervisors were complemented by the site surveillance activities carried out by the ConEs. In particular, Louis Kwan confirmed that he spot-checked the couplers[301] by having the rebars unscrewed for checking during routine site surveillance,[302] which he found to be satisfactory.[303]

(ix) Similar to the IOWs, Louis Kwan carried out site surveillance and

---

[297] **[T30/131:15-132:12; 142:10-22]**.

[298] **[T30/142:23-143:5]**.

[299] **[T30/131:16-18; 142:4-9]**.

[300] **[T30/62:21-25]**.

[301] **[T29/109:3-110:13]**; paragraphs 58 to 59 of the statement of Louis Kwan**[B1/B396]**.

[302] That is, before the splicing assemblies became obstructed by other rebar layers: see **[T29/115:13-116:8]**.

[303] **[T29/113:2-114:22]**.

inspection of the coupler splicing assemblies even though he was not formally assigned to countersign any record sheets under the QSP:

> "*[…] because […] as an engineer, I think I should ask more on site, no matter whether that particular responsibility or particular form is going to be signed by me or by any other colleagues, but as an engineer I think I should ask them to show me how they properly do it, and if they don't then I need to make sure that they -- they need to properly do the works.*"[304]

134. Therefore, the weight of the evidence is that MTRCL's IOWs and ConEs carried out the requisite site surveillance and inspection of the coupler splicing assemblies. Further, as will be discussed in more detail below:

(i) The fact that the system of supervision and inspection was working is demonstrated by MTRCL's consistent evidence that the inspectorate staff identified and procured the immediate rectification of the occurrences of trimmed rebar threaded ends.

(ii) There was one isolated exception in bay C1-5,[305] as observed by Andy Wong, of three non-compliant rebars which could not be rectified because they were located in the lower portion of the top mat and concreting was in progress.[306] However, this does not mean that routine site surveillance or hold point inspections have not been properly carried out in that bay, given that MTRCL's routine site surveillance and hold point inspections[307] were necessarily based on spot-checking[308] rather than 100% inspection of every rebar and coupler, and it is never possible to achieve perfect workmanship.

135. However, it does appear that neither the IOWs[309] nor the ConEs[310] who carried

[304] **[T29/115:2-9]**; also **[T29/23:10-16]**.

[305] **[T30/129:10-15]**.

[306] Paragraphs 33 to 34 of the statement of Andy Wong **[B1/B455]**; **[T30/139:3-5]**.

[307] Paragraph 50 of the statement of Louis Kwan**[B1/B389]**.

[308] See Louis Kwan's oral evidence at **[T29/59:22-60:6; 109:3-12]**.

[309] See Kobe Wong's oral evidence at **[T30/4:17-5:20]**.

[310] See Louis Kwan's oral evidence at **[T29/16:13-24]**.

out routine site surveillance and hold point inspections were formally assigned and/or formally informed of their assignment as quality control supervisors under the QSP to countersign any coupler inspection record sheets[311].

136. The lack of any formal assignment of a quality control supervisor under the QSP for the EWL slab resulted in confusion between the IOWs and ConEs as to their respective inspection and record-keeping responsibilities, and this again contributed to the inaccuracies in the June Report. As TM Lee acknowledged, "*certainly that is something we need to look at, why there's not a clear assignment*"[312]. It is therefore convenient to consider the project management issues arising from MTRCL's allocation and implementation of its supervision and inspection responsibilities.

**VI(ii)(c) Observations of the PM Experts**

137. In general, the PM Experts did not identify any material issues relating to the supervision and inspection of the rebar cage installations and coupler splicing assemblies in the D-walls. The focus for the CoI is therefore on the EWL slab.

138. In respect of the supervision and inspection of the coupler splicing assemblies for the EWL slab, both PM Experts agreed that "*MTRCL had in place a supervision team comprising engineers and inspectors who had a continuous presence on site to undertake the supervision duties*"[313]. Furthermore, Huyghe observed that:

> "*It appears from the evidence of the MTRCL's Kobe Wong [T29/125:24-126:15, T29/127:10-16, T30/8:11-16] and Andy Wong [T30/142:18-22] that they inspected the works, including the coupler splicing assemblies. These site inspections identified instances of rebar/coupler defects and the site staff ensured that these matters were remedied quickly.*"[314]

139. Huyghe's unchallenged opinion was that the "*project staff members appear to*

---

[311] This was despite the fact that Jason Wong (CP) at [**T31/138:4-20]** and Kit Chan (CM and CP Representative) at **[T26/105:5-14]** were under the impression that Kobe Wong was the quality control supervisor for the EWL slab just as he was for the D-walls.

[312] **[T32/37:14-19]**.

[313] Paragraph 27 of the JSPM **[ER/9/T-4]**.

[314] Paragraph 178 of Huyghe's Report **[ER1/2/44]**.

*have conducted their inspection and supervision duties based on their collective experience, regardless of whether there was any stated procedure to be followed*"[315] and that Kobe Wong was a grade T3 TCP "*so he had the right credentials*".[316]

140. Nevertheless, both PM Experts agreed that "*there was a lack of clarity for the designated responsibility of formal inspections and for maintaining records*"[317] as there was no formal assignment or record of MTRCL's quality control supervisors.[318]

141. Again, MTRCL accepts that there is room for improvement, and notes that the PM Experts recommended the following actions:

(i) A clear and consistent definition of supervision should be developed throughout the documentation, with specific requirements about the information that needs to be recorded and certified[319].

(ii) A review of the current documents on supervision duties should be carried out to produce an all-inclusive, multilingual supervision manual accessible to all involved in supervision duties[320].

(iii) Options for use of technology to support efficiency and effectiveness in supervision and record-keeping should be reviewed[321].

(iv) A review of the training process should be carried out to include ongoing refresher training and integrated training sessions with the contractor on

---

[315] Paragraph 180 of Huyghe's Report **[ER1/2/44]**.

[316] **[T39/57:7-9]**.

[317] Paragraph 27 of the JSPM **[ER1/9/T-4]**; paragraph 181 of Huyghe's Report **[ER1/2/44]**.

[318] **[T39/55:19-56:7]**.

[319] Paragraph 28 of the JSPM **[ER1/9/T-4]**; item 2 of Table 3 of Huyghe's Report **[ER1/2/68]**; paragraph 171 of Rowsell's Report **[ER1/1/82]**.

[320] Paragraph 28 of the JSPM **[ER1/9/T-4]**; item 6 of Table 3 of Huyghe's Report **[ER1/2/72]**; paragraphs 170 to 173 of Rowsell's Report **[ER1/1/82]**.

[321] Paragraph 28 of the JSPM **[ER1/9/T-4]**; items 7 and 12 of Table 3 of Huyghe's Report **[ER1/2/74;79]**; paragraphs 174 to 176 of Rowsell's Report **[ER1/1/83]**.

PIMS, contract procedures and the QSP[322].

(v) An assessment should be carried out of the procedures and processes actually occurring on the project to compare them with the procedures and processes in the PIMS and BD requirements[323].

(vi) A QA/QC team separate from the CM team should be established, with a standalone PIMS policy on quality control[324].

**VI(ii)(d) Improvement measures already taken by MTRCL**

142. The relevant improvement measures already adopted by MTRCL are set out in items 1, 2, 4, 5, 6, 7 and 12 of Table 3 of Huyghe's Report, and Stephen Hamill's updated memorandum on the latest developments.[325]

143. This is very much in line with Lincoln Leong's clear evidence that:

> "*[…] the current thinking is to strengthen a number of the lines of defence, including, from a government perspective, looking at enablers like more technology, including enhancing the quality – the number of people, for instance, and the extent of our quality assurance aspect. So there are a number of issues that we are looking at, and some have already been implemented, to further strengthen the three lines of defence.*"[326]

144. The use of technology was particularly welcomed by Rowsell, and he explained that:

> "*The more you can rely on the technology, the more efficient it is. But it also supports communications between the teams so that […] you can immediately use the systems to send out messages and notifications to all members of the team or indeed stakeholders*".[327]

**VI(iii) Contemporaneous record-keeping for coupler inspections**

**VI(iii)(a) Factual evidence on MTRCL's supervision and inspection**

---

[322] Item 5 of Table 3 of Huyghe's Report **[ER1/2/71]**; paragraph 188 of Rowsell's Report **[ER1/1/85]**.

[323] Item 1 of Table 3 of Huyghe's Report **[ER1/2/67]**; paragraph 153 of Rowsell's Report **[ER1/1/79]**.

[324] Item 4 of Table 4 of Huyghe's Report **[ER1/2/70]**; paragraph 153 of Rowsell's Report **[ER1/1/79]**.

[325] See under cover of Mayer Brown letter of 22 January 2019, as per the request of the CoI at [T40/1:17-38]

[326] **[T32/168:11-19]**.

[327] **[T39/120:3-8]**.

145. As already cited above, the QSP required the quality control supervisor record sheets to be prepared, maintained and kept by Leighton in an inspection logbook on site, and MTRCL's site supervisors had to countersign them.[328]

146. However, at the time of the EWL slab works, Leighton had not provided any record sheets or inspection log book to MTRCL for countersignature, and there was inadequate follow-up action during the currency of the works to obtain such records from Leighton. The CoI has heard detailed evidence as to the reason for this omission, and it boils down to *five key points*:

(i) At the time of the EWL slab works, the understanding of Jason Wong[329] and Kit Chan[330] (CP and CP Representative respectively) was that Kobe Wong was the quality control supervisor for both the D-walls and EWL slab. Thus, Kobe Wong/the IOWs were expected to be aware of the QSP requirements.[331]

(ii) James Ho, who took up the role of SConE on Contract 1112 in February 2015, was not aware of the absence of the inspection log book for the EWL slab at the time of the works, as he assumed that records were kept for the EWL slab as with the D-walls.[332]

(iii) The other ConEs, Derek Ma[333] and Louis Kwan[334] have given evidence that they were not made aware of the QSP and did not attend any special induction or meeting on the QSP requirements.

(iv) At the beginning of the construction of the EWL slab, Kobe Wong (who was still an IOW at the time) did ask Leighton whether there should be

[328] **[B5/B2647]**.
[329] [**T31/138:4-20]**.
[330] **[T26/105:5-14]**.
[331] **[T26/104:23-105:4]**.
[332] **[T26/150:13-151:7]**.
[333] **[T27/63:18-64:13]**.
[334] **[T28/159:14-23]**.

similar record sheets for the EWL slab as with the D-walls. Leighton's response was that the QSP only applied to the D-walls and barrettes[335]. This was because the QSP submitted under CSF no. 1112-CS-LCA-CB-000007A dated 23 August 2013[336] was under a cover sheet specifically referring to the "*installation of couplers for Diaphragm wall and barrettes*"[337].

(v) Kobe Wong also explained that MTRCL's ConE team during the D-walls works had left by the time of the EWL slab works[338]. He was told by his seniors that the ConEs were responsible for inspecting the rebar fixing works, and as he was not specifically assigned as a quality control supervisor, he did not ask Leighton any further for record sheets for countersigning as he assumed that a relevant grade T3 TCP would prepare the necessary records[339].

147. In those circumstances, Leighton's failure to maintain any record sheets or inspection log book remained unknown within the CM team, until around early February 2017, when MTRCL's Carl Wu and Peter Fung were commissioned to carry out an internal quality assurance and quality control review. The purpose and scope of the internal review was as follows:

(i) In the light of the email dated 6 January 2017 from Jason Poon to Leighton[340], TM Lee and Rooney both considered in parallel that an investigation would be prudent, and TM Lee approached Carl Wu for that purpose[341].

(ii) In commissioning the internal review, TM Lee wanted "*bigger comfort*

[335] **[T29/128:15-129:7]**.
[336] **[B5/B2659-B2675]**
[337] **[T29/128:15-133:3]**; paragraph 9 of the reply statement of Kobe Wong **[B16/B13659]**.
[338] **[T29/134:16-24]**.
[339] **[T30/5:11-18; 10:12-21]**.
[340] **[C12/C7923]**.
[341] **[T28/132:7-18]**.

*that this line or this slab is constructed in accordance with our PIMS requirements*".[342] This is consistent with Carl Wu's evidence that the exercise was a review and not an investigation:

> "*The review was a management system audit, the scope of which was stated in my review report. The investigation in relation to this bar cutting incident was to find out who did what, when, how, where and why, which was not my mandate.*"[343]
>
> "*The primary objective of this review, by way of a management system audit, is to confirm, through review of the records, that the management system – that a management system is in place to establish confidence that the EWL slab is constructed as planned. That's the primary objective.*"[344]

(iii) TM Lee explained that the focus of the internal review was not so much on the cause because the incidents identified had been rectified.[345] Rooney similarly stressed that there was no evidence at the time that there was anything more than a limited number of incidents which had been rectified.[346]

(iv) Rooney pointed out that although a more in-depth investigation could have been carried out, MTRCL was unlikely to get much out of Fang Sheung. The investigation would have gone to another level had something more substantial been identified.[347]

(v) The review of the records provided by the CM team was carried out by Peter Fung over two to three days,[348] and James Ho and Kobe Wong were interviewed as they were considered to be a good representation of the CM

---

[342] **[T32/21:1-10]**.

[343] **[T31/55:12-16]**.

[344] **[T31/70:22-71:2]**.

[345] **[T32/23:8-12]**.

[346] **[T28/54:7-15]**.

[347] **[T28.47:7-49:25]**.

[348] **[T31/60:11-61:22]**.

team.[349] The final report was issued on 8 February 2017.[350] Carl Wu's understanding at the time was that "*the recommended follow-up actions are related to records which require better collation; they were incomplete*".[351]

(vi) In reaching the conclusion that MTRCL had complied with its supervision and inspection requirements despite certain incomplete records, Carl Wu considered that all the RISC forms showed that the CM team had carried out their duties on a continuous basis[352]:

> "*Of importance is the RISC form that represents continuous inspection by the MTR construction management team, and that we were satisfied that the works are constructed according to the arrangements. There might be incomplete records, as I mentioned in the ten bullet points, but that doesn't mean a system breakdown of any kind, and from a management system audit point of view we can conclude in a positive manner that the system is working. In particular, NCR was detected, reported and closed out, and that's a good sign that the system is working.*"[353]

(vii) In a similar vein, Rooney did not consider it premature to conclude that the construction of the EWL slab was safe, as MTRCL had ascertained the approximate location of Jason Poon's photo, and the fact that Fang Sheung was most likely to be responsible[354].

(viii) The internal review report acknowledged that Leighton's records were incomplete, and recommended at paragraph 5.1 that MTRC's construction team had to "*[c]onfirm the frequency of LCAL and MTRCL supervision were in compliance with the requirement of the QSP, and were recorded on the Record Sheet*"[355]. Carl Wu thought the CM team would follow

[349] **[T31/59:21-60:5]**.
[350] **[B7/B4516-B4520]**.
[351] **[T31/63:20-65:11]**.
[352] **[T31/67:20-68:15]**.
[353] **[T31/71:24-72:9]**.
[354] **[T28/137:18-139:22]**.
[355] **[B7/B4519]**.

up[356].

(ix) To that end, James Ho followed up on the recommendations, and he was satisfied that there were RISC forms and TCP records in place[357]. He also followed up on the inspection log book by instructing Kobe Wong to ask Leighton for the records[358], and by raising it as a regular agenda item in weekly meetings[359]. Unfortunately, this ultimately revealed that Leighton simply had not maintained any inspection log book during the EWL slab works.

148. After the media reports on 30 May 2018 alleging defective steelworks and coupler installations in the D-walls and EWL slab, MTRCL took the necessary steps to urgently obtain information as to its compliance with the relevant supervision and inspection requirements for Contract 1112.

149. The CM team's discussions led to the conclusion that sufficient quality control supervision was carried out, but specific compliance with the 20/50% supervision requirement under the QSP and BD acceptance letters had to be substantiated internally due to Leighton's failure to maintain an inspection log book. For this purpose, the CM team undertook two exercises within a very tight timeframe.[360]

150. First, Kobe Wong was instructed by James Ho to prepare an internal summary of the supervision carried out in respect of the coupler assemblies, and this resulted in a simple summary table entitled "*1112 Coupler Installation checklist*"[361] based on Kobe Wong's review of site photos taken during daily site surveillance[362]:

(i) Kobe Wong habitually took photos during site surveillance, including

[356] **[T31/87:23-88:5]**.

[357] **[T26/153:8-155:14]**.

[358] Paragraph 48 of the statement of James Ho **[B1/B335]**; also Kobe Wong's oral evidence at **[T30/4:29]**.

[359] **[T27/36:2-8]**.

[360] Paragraph 54 of the statement of Kobe Wong **[B1/B434]**.

[361] **[H14/H35070]**.

[362] Paragraphs 55 of the statement of Kobe Wong **[B1/B434]**.

photos of coupler splicing assemblies[363]. As counsel for the CoI acknowledged, these photos were "*illustrative of the process of [Kobe Wong's] inspections*"[364].

(ii) Kobe Wong clarified that the site photos which he relied on in preparing the summary table were those disclosed by MTRCL[365] i.e. over 170 photos – a sizeable collection of photographic records of the EWL slab works[366].

(iii) The dates in the summary table correspond to the dates of the record photo(s) reviewed and thus the dates when the site surveillance and inspection took place. The table also identifies the locations where the photos were taken (as recorded in the photos' file names[367]) and thus where the surveillance/inspection was carried out progressively as the coupler splicing assemblies were being completed[368].

(iv) During the hearing, Kobe Wong demonstrated (with a number of illustrative examples[369]) the contents of those photos and the basis upon which he relied on those photos to confirm that sufficient supervision and inspection of the coupler splicing assemblies were carried out[370]. In Kobe Wong's own words:

> "*Some of the photos I took were very clear. For example, there was one photo that you saw yesterday, I actually put a ruler next to the coupler. So that would prove that I had checked, and there was some general view or some overview showing that the workers were carrying out coupler installation or actually have finished steel fixing. That would mean that I had inspected those areas, I had seen the*

[363] **[T29/139:11-140:7]**.

[364] **[T29/139:7-10]**.

[365] **[B17/B24203-B24373]**.

[366] **[T30/22:13-26:24]**.

[367] **[T30/79:5-8]**.

[368] **[T30/102:11-24; 105:25-106:23].**

[369] See e.g. the site photos of: vertical coupler installations in west D-walls in bay C2-3 taken on 2 October 2015 **[B17/B24211-B24212]**; bottom mat coupler connections in bay C1-4 taken on 15 September 2015 **[B17/B24231-B24232]**.

[370] **[T30/102:4-109:22]**.

*installation of the couplers in that area […] we would check whether there was a maximum tolerance of 1 to 1.5 pitch of the thread.*"[371]

"*[…] Therefore, I would check the photos that we had taken, and then, from those photos, together with the time we spent on inspection on site by myself and my colleagues, and apart from the five incidents that I mentioned in my witness statement, which were all rectified immediately, […] and I was confident that, for those records that I signed, there was no problem and they were okay.*"[372]

(v) Understandably, the summary table was prepared under "*a pressing timetable*", so the statement "*more than 60 per cent of the installed couplers were inspected*" was "*a rough estimate*" based on the bays inspected.[373]

(vi) There was certainly no intention to mislead or to present the summary table as a contemporaneous document, especially since Kobe Wong did not know whether the table was going to be shown to anyone other than James Ho[374] at the time of preparing it.

(vii) As Kobe Wong emphasised, "*this is just a summary. […] So [his] understanding is there is no need to put a date on it*"[375]. It would have been plain to a reasonable person reading the table that this was an after-the-event summary of the dates of previous inspections.

151. Derek Ma said he showed Kobe Wong's summary table to Government representatives on 6 June 2018 and informed them that it was the only MTRCL record available[376], but BD did not accept it and specifically requested further records which were in a similar format as Appendix B of the QSP.[377] This is corroborated by:

(i) Paragraph 10 of the statement of BD's Edward Wong Wing Wah

[371] **[T30/20:7-23]**.

[372] **[T30/21:13-20]**.

[373] **[T30/16:16-19:7]**.

[374] **[T30/46:16-18]**.

[375] **[T30/45:14-15]**.

[376] **[T27/103:19-104:11, 105:11-25]**; paragraph 32 of the statement of Derek Ma **[B1/B365]**.

[377] **[T27/149:13-151:8]**.

(Structural Engineer), who visited the site office on 6 June 2018:

> "*[…]* ***I also referred Kobe Wong to Leighton's coupler checklists [e.g. H14/35055] and told him that MTRCL's checklists should be in the same form****, but the frequency of inspection referred to in the 2 sets of checklists should be different. […]*"[378]

(ii) Paragraph 10 of the statement of BD's Patrick Fan Tak Pun (Structural Engineer), who also visited the site office on 6 June 2018:

> "*[…] However, [the summary table] does not show the dates of signing such records and could not prove that they were contemporaneous records of satisfactory inspection of the works concerned.* ***As such, we did not accept the records and requested MTRCL to provide further documents for checking.*** *[…]*"[379]

152. In the light of the foregoing, James Ho instructed Derek Ma and Kobe Wong to conduct a second exercise and prepare a set of detailed checklists[380]:

(i) Both Rooney[381] and James Ho[382] explained that the purpose of the coupler checklists was for the CM team to substantiate internally that they had complied with the 20/50% supervision requirements in respect of coupler splicing assemblies. In Derek Ma's words, "*somehow we should have such documents to tell ourselves that at least we did carry out such inspections*"[383].

(ii) James Ho[384] and Derek Ma[385] said that the checklists were substantially based on the soft copy templates provided by Leighton (with the number of couplers, drawing references and sketches included) and the D-wall as-built drawings.

---

[378] **[H20/H40414]**.

[379] **[H20/H40410]**.

[380] **[B7/B4537-B4598]**

[381] **[T28/28:23-31:10]**.

[382] **[T27/34:2-8; 41:7-12]**.

[383] **[T27/88:4-6]**.

[384] **[T27/39:14-40:7]**.

[385] **[T27/73:16-75:15]**.

(iii) The preparation of the coupler checklists was carried out under immense time pressure, such that there was not much time to review the information therein. For instance, Derek Ma and Kobe Wong explained that they inadvertently omitted to remove items 5 and 6 (relating to additional drill-in bars which were not subject to the QSP[386]) from some of the checklists[387], and the Chairman rightly noted that "*this would appear to be evidence of that fact*"[388].

(iv) Kobe Wong provided general directions to Derek Ma to ensure that the percentage of couplers covered by the checklists corresponded to the available record photos relied on by Kobe Wong[389]. Kobe Wong was satisfied based on the large number of site photos and his recollection that he and his colleagues had carried out site surveillance in respect of far more than 50% of the coupler splicing assemblies, and he was therefore sufficiently confident to sign the coupler checklists. This was confirmed by the oral evidence of Derek Ma[390], and also Kobe Wong who explained that:

> "*I looked at the record photos, and then there were photos taken by other colleagues. For this area, there were never any problems with coupler installation, and then I myself and my colleagues, when carrying out a site inspection, in the time we did so, I think it could more than cover the assembly process. That's why I was confident to strike out "NS".*"[391]

(v) Derek Ma's unchallenged evidence was that he told the Construction Manager, Michael Fu, that these checklists were not contemporaneous, such that it cannot be dated back to 2015. An express statement was put in on Michael Fu's recommendation to make it clear that it was a

[386] **[T27/98:25-99:4]**; **[T30/59:12-21]**.

[387] **[T27/97:19-98:8; 146:11-148:3]**.

[388] **[T28/74:19-75:9]**.

[389] **[T30/63:18-23]**.

[390] **[T27/91:23-92:8, 94:10-15]**.

[391] **[T30/29:2-8]**; also paragraphs 59 to 60 of the statement of Kobe Wong **[B1/B435]**.

"*retrospective record of coupler installation*"[392]. Kobe Wong considered that "*[t]here was no concealment that these records were retrospective*"[393].

(vi) Kobe Wong was similarly at pains to stress this during cross-examination, explaining that "*[a]t that time, I was certain that the date would not be in 2015, because this is a retrospective record*"[394]. If there were any intention to mislead or deceive, the checklists would have been dated back to the period of the EWL slab works[395], but this was distinctly *not* what was done, and both Derek Ma and Kobe Wong very properly and emphatically considered that to be unacceptable. Indeed, this was why Kobe Wong was "*strongly opposed against signing the records provided by Leighton*".[396]

(vii) Nevertheless, a question did arise within the CM team as to which date should be put on the checklists. As Kobe Wong explained, this was because he had already relocated to the Property Division, such that as at June 2018 he was no longer in a position to sign off any document as an IOW or SIOW, and this was an unprecedented scenario in his view.[397]

(viii) It was within this exceptional context and after a discussion within the CM team that Kobe Wong was instructed to put down the date of 10 February 2017, so as to make it clear that this exercise was in response to the internal review carried out by Carl Wu and Peter Fung. This has been corroborated by the consistent evidence of James Ho,[398] Derek Ma[399] and Kobe Wong.[400]

---

[392] **[T27/75:21-76:2]**.

[393] **[T30/38:15-22]**.

[394] **[T30/30:18-19; 39:6-7]**; also paragraph 57 of the statement of Kobe Wong**[B1/B434]**.

[395] The steel fixing works in the EWL track slabs commenced in March 2015 and ended in August 2016. The steel fixing works in the NSL track slab commenced in December 2015 and ended in May 2016.

[396] **[T30/41:24-42:1]**.

[397] **[T30/30:12-17; 39:2-5; 53:10-13]**.

[398] **[T27/2:19-3:4]**; paragraph 53 of the statement of James Ho **[B1/B336]**.

[399] **[T27/72:5-73:14]**; paragraph 38 of the statement of Derek Ma **[B1/B367]**.

[400] **[T30/30:8-31:2]**; paragraph 57 of the statement of Kobe Wong**[B1/B434]**.

(ix) Although the backdating of the coupler checklists has given rise to an unfortunate confusion, it is important not to lose sight of the fact that these coupler checklists were *not* prepared with any intention to mislead or deceive. This is evidenced by Derek Ma's conscious decision not to put MTRCL's logo on the checklists as this was not to be disclosed as an official document[401], and by Kobe Wong's willingness to sign the records only on the basis that they were for internal use[402] and "*for his own record-keeping*"[403]. It is telling that Kobe Wong has consistently given evidence to that effect:

> "*[…] When these records were prepared, they were meant to be an internal document. I did not expect them to be made public or to be passed on to people outside of my team.*"[404]
>
> "*[…]If the documents were to be passed on to other parties such as the government, then I believe it should be the relevant T3 person to sign the forms.*"[405]
>
> "*Because it was for internal use, and it's not appendix B mentioned in QSP. That's why I wouldn't mind preparing that record.*"[406]

(x) Consistent with the foregoing, the retrospective nature of the checklists was in fact emphasised to BD, RDO and Pypun's representatives, when they were briefly shown the coupler checklists at MTRCL's site office on 7 and 8 June 2018 on the basis that no photocopies were permitted. In Derek Ma's words:

> "*I did emphasise that the records were prepared retrospectively. On day one, when I showed them the spreadsheet, I told them that we did not have those records at the time.*"[407]

(xi) Judging from how full and frank Kobe Wong was in his witness statements

---

[401] **[T27/89:10-91:10]**.

[402] **[T30/41:24-42:1]**; paragraph 56 of the statement of Kobe Wong**[B1/B434]**.

[403] **[T27/89:1-4]**; also paragraph 35 to 37 of the statement of Derek Ma **[B1/B366-B367]**.

[404] **[T30/57:5-8]**.

[405] **[T30/57:16-18]**.

[406] **[T30/94:21-23]**.

[407] **[T27/113:6-9]**.

and his testimony, it is not consistent with his backdating being an intention to deceive or mislead anyone.

(xii) In the cold light of day and with the benefit of hindsight, one may well have done things differently. However, given that there were so many documents to be collated and too little time to think things through carefully at the time,[408] it is understandable why matters were handled in the way they were. The fact remains, as reiterated by Derek Ma, that the intention was *not* to give the impression that the checklists were prepared in February 2017[409] and "*[n]ot to mislead them that these were contemporaneous records*".[410]

153. The signed coupler checklists were provided by James Ho to Rooney on 15 June 2018. It is abundantly clear that although the checklists somehow made their way into the attachments to the June Report, there was plainly no intention whatsoever from MTRCL's senior management or CM team to mislead or 'dress up' the facts:

(i) James Ho said that he reminded Rooney that these checklists were internal and should not be publicised, and this is corroborated by Rooney[411].

(ii) James Ho does not know why or how the coupler checklists ended up in the June Report[412], and Rooney considered that the checklists were "*an internal document that had been prepared at fairly short notice*" and "*there was no value in adding them to the report as attachments*"[413].

(iii) Finally, it bears emphasis that Lincoln Leong (CEO)[414] and Philco Wong (then Project Director)[415] were both adamant that while they asked for the

[408] **[T30/51:2-10]**.
[409] **[T27/82:3-18]**.
[410] **[T27/100:4-7]**.
[411] **[T27/49:9-50:8]**; **[T28/66:12-21]**.
[412] **[T27/50:9-13]**.
[413] **[T27/70:17-71:2]**.
[414] **[T32/127:12-21]**.
[415] **[T32/53:10-23]**.

contents of the June Report to be verified, they did not instruct the checklists to be attached thereto, and most certainly did not know at that time that the checklists were retrospective. This evidence has not been challenged.

154. Based on the foregoing factual evidence, MTRCL reiterates and emphasises that there was absolutely no intention to mislead, and this has consistently been borne out by MTRCL's evidence. In any event, MTRCL has been upfront about the lack of contemporaneous record sheets from day one of this CoI[416].

155. The important point, as TM Lee emphasised during the hearing, is that MTRCL is quite confident that its "*team of inspectors did do the physical check*", and the issue was that the records were not presented in the QSP format, so the CM team needed to "*close the gap*"[417]. It bears emphasis that:

> "*SCL is an extremely complicated and colossal project. In my view, it's as complicated as building Crossrail in London. […] So, on a macro scale, they did a good job. On a micro scale, they also managed to keep a close eye on it. They […] may not be up to speed in documentation. I appreciate that. It's a common problem in the construction industry. The reason why: the site inspector, the foreman, the paper-writing, or the writing, keeping records, they are not as good as legal professionals. Their priority is to maintain the site in a safe manner, making progress, moving the job forward. This is an area of improvement that the whole construction industry in Hong Kong needs to focus on.*"[418]

156. However, the events leading up to the preparation of the retrospective checklists do evidence a failing on the part of both MTRCL and Leighton on Contract 1112 so far as the preparation and checking of the relevant records are concerned, and this ultimately contributed to the inaccuracies in the June Report. MTRCL's sentiments were very much expressed by Lincoln Leong:

> "*Once again, I would say that MTR and the use of PIMS […] has been used for a number of years and have successfully built new railway lines, four of which have been opened in the last three or so years, and I'm sure*

[416] Paragraphs 104 to 110 of MTRCL's opening statement. **[OS/5/17-18]**

[417] **[T32/35:20-36:2]**.

[418] **[T32/17:8-18:17]**.

> *that proper records have been kept for many of those projects. It's very unfortunate […] that we may not have had that for this particular situation.*"[419]

157. In the circumstances, it is again necessary to consider the PM Experts' recommendations in that regard and identify the improvements that can be made.

**VI(iii)(b) Observations of the PM Experts**

158. Huyghe observed that "*MTRCL's construction management team failed to instruct its site inspectors of their responsibility to receive these Record Sheets for the EWL slab construction and co-sign their acceptance. Both Leighton and MTRCL are responsible for this omission*".[420] He acknowledged, however, that there were other records in place:

> "*[…] I understand that the site inspection team kept the site diary on a daily basis. I have seen the MTRCL site diary from August to December 2015 [SD5707-SD7042], namely the time of the EWL slab rebar fixing. […] I consider the site diary is reasonably detailed.*"[421]

159. Although there are site diaries and photographic records in place, Huyghe nonetheless considered that "*MTRCL should have followed the QSP requirements regarding the logging and execution of Record Sheets of coupler installation inspections*"[422]. Rowsell accurately observed that "*the specific requirements for the information that needed to be recorded and retained by the MTRCL and Leighton's site supervision and inspection teams were not clearly set out*"[423], and this no doubt contributed to the confusion at the time of the EWL slab works.

160. The PM Experts' opinions are consistent with Kobe Wong's acknowledgement during the hearing that MTRCL's record-keeping in respect of splicing assemblies could have been done in a better way.[424] MTRCL accepts that there is room for

---

[419] **[T32/164:8-15]**.

[420] Paragraph 178 of Huyghe's Report. **[ER1/2/44]**

[421] Paragraph 179 of Huyghe's Report. **[ER1/2/44]**

[422] Paragraph 181 of Huyghe's Report. **[ER1/2/44]**

[423] Paragraph 80 of Rowsell's Report. **[ER1/1/53]**

[424] **[T30/82:19-83:6]**.

improvement, and as Lincoln Leong very fairly put it:

> "*As with all record-keeping systems, including ours, one can always do better, and I would say that in this particular case there are issues with record-keeping where we could have improved and we could have done better, and in fact, because of that, there's been a number of external consultants, including Turner & Townsend, appointed to look at this and other related matters. […]*
>
> *Chairman, my colleagues, particularly my project colleagues, they are dedicated, hard-working individuals. The inspectors and our engineers work extremely hard. I don't know the background or the details, but in the time I've seen them, that I've met with them, they're the sort of people who would go and fulfil their job requirements, be that inspection or what that job requirement is. […]*
>
> *I would absolutely agree with you, Chairman, that keeping records is at the forefront of project management, because in addition to just the physical build there is the records that demonstrate what has physically been built, and therefore record-keeping is very important.*"[425]

161. At the end of the day, both PM Experts agreed that "*there was a lack of clarity for the designated responsibility of formal inspections and for maintaining records*" [426] . MTRCL again welcomes those recommendations and will implement them.

### VI(iii)(c) Improvement measures already taken by MTRCL

162. The relevant improvement measures already adopted by MTRCL are again set out in items 1, 2, 4, 5, 6, 7 and 12 of Table 3 of Huyghe's Report and Stephen Hamill's updated memorandum[427].

## VI(iv) Management of change in connection detail and as-built records

### VI(iv)(a) Factual evidence on the Second Change

163. The background and nature of the Second Change have been explained in

[425] **[T32/161:9-16; 162:12-19; 164:2-7]**.

[426] Paragraph 27 of the JSPM. **[ER1/9/T-4]**

[427] As appended to Mayer Brown's covering letter dated 22 January 2019.

MTRCL's opening submissions,[428] and the safety of the structure has been addressed above in Section IV**.** It is therefore convenient at this juncture to consider the Second Change from a project management perspective.

164. Concerning the professional judgment of the CM team that the Second Change was minor, the following key points can be distilled:

(i) As the CM and CP Representative at the time, Kit Chan was involved in the discussions and decision in respect of the Second Change[429]. He explained that the Second Change reverted to the original construction detail in the sense of having two layers of top rebars with uniform spacing[430]. For this reason, Kit Chan considered it to be a minor "*change of construction sequence*" and a "*better construction detail*", and since this rebar arrangement was approved by the BD in 2013, no design calculation or justification was required – "*from an engineering point of view, this is very simple*"[431].

(ii) This is corroborated by James Ho, who was at all material times MTRCL's SConE and grade T5 TCP. His evidence that he "*considered the hacking off of the top of the diaphragm wall and the use of full-length through-bars in the top layer to be a minor change*", and that "*a through-bar is a far better construction detail than the use of couplers*", has not been challenged.[432]

(iii) The CM team's view that the Second Change was minor in nature with no

[428] See MTRCL's oral opening submissions at **[T2/19:13-24; 52:5-63:7]** and paragraphs 101 to 103 of MTRCL's written opening statement.

[429] Paragraphs 48 to 49 of the statement of Kit Chan **[B1/B279-B280]**.

[430] **[T26/39:16-40:15]**; paragraph 49 of the statement of Kit Chan **[B1/B279-B280]**.

[431] **[T26/45:1-16]**.

[432] Paragraph 68 of the statement of James Ho **[B1/B343]**.

structural impact[433] is supported by the evidence of Leighton[434] and Atkins.[435]

165. It is noteworthy that Kit Chan drew an analogy between the cutting down of the D-walls and the hydro-demolition of parts of the D-walls excavation face to form a shear key, which is very common[436]. This is in line with the opinion of the SE Experts:

(i) The JEM records the agreement that "*cutting-down of a D-wall is a normal part of the construction process […] and is analogous to the construction of a shear key*"[437].

(ii) McQuillan robustly supports this view, opining that the "*formation of a "construction joint" at the top of the cut-down D-wall is analogous to forming a normal shear key in a wall or slab*"[438].

(iii) Glover similarly opines that the "*[c]utting down of Diaphragm Walls is a normal part of box construction, both to reduce the level of the as-cast wall and the formation of the essential shear key*"[439].

166. Furthermore, the consistent evidence of the CM team is that the Second Change was considered to have originated from a design requirement, and the CM team was thus under the impression that the DM team was aware of the Second Change and would follow up with Leighton:

(i) Kit Chan's understanding was that there was a design requirement to cast

---

[433] See also Section IV above which outlines the SE Experts' views that the structure is safe.

[434] Paragraphs 42 to 44 of the statement of Brett Buckland **[C27/C20810-C20811]**; paragraphs 36 to 37 of the statement of Justin Taylor **[C27/C20841-C20842]**; paragraphs 15 to 17 of the 2nd statement of Stephen Lumb **[C27/C20890-C20891]**.

[435] Paragraph 98 of the statement of John Blackwood **[J1/J75]**; paragraph 27 of the statement of Chan Chi Kong **[J6/J4506]**; paragraph 35 of the statement of Lee Wan Cheung **[J6/J4528]**; paragraph 30 of the statement of Sung Chi Man **[J6/J4539]**.

[436] **[T26/46:3-10]**.

[437] Paragraph 3 of the JEM, as contained in Appendix XI to McQuillan Report.

[438] Paragraph 55 of McQuillan's Report.

[439] Paragraph 8.9 of Glover's Report.

the EWL and OTE slabs monolithically, and that this originated from design amendment report PWD-059A3[440] (concerning the omission of u-bars from the D-walls) which was submitted to and approved by BD[441]:

> "*To comply with the full tension anchorage lap length (FTAL) from the slab rebar principle,* ***the OTE wall must be concrete monolithically (i.e. at the same time) with EWL (3m) slab*** *and the wall rebar to extend with full lap length (FLL) provision from the OTE wall construction joint (CJ) for future wall rebar connection.*"[442]

(ii) Kit Chan was under the impression that the DM team was involved in the submission of the design reports and knew about the design requirement[443]. In addition to report PWD-059A3, Kit Chan had in mind report TWD-004B3[444], which stated at paragraph 6.2:

> "***The top of diaphragm wall panel will be trimmed to the lowest level of top rebar for the EWL slab (min 420mm below the top level of EWL slab).***
>
> *The top rebar of EWL slab at the D-wall panel will then fix to the top rebar of OTE slab to achieve full tension laps.*
>
> ***The EWL slab and OTE slab will be casted concurrently*** *with temporary openings around the existing columns and pile caps.*"[445]

(iii) James Ho also had a similar understanding at the time from Andy Leung's email dated 25 July 2015 to Justin Taylor[446] which stated that "*[p]ortion of the wall should be cast together with the OTE slab as a good practice. Otherwise, one more CJ is introduced between them […]*". His unchallenged understanding was that Andy Leung was acknowledging that the top of the east D-walls must be cast monolithically with the EWL and

---

[440] **[B10/B7322-B7334]**.

[441] **[T26/41:2-42:3]**.

[442] **[B10/B7334]**.

[443] **[T26/46:15-50:2]**.

[444] **[B12/B8984-B9041]**.

[445] **[B12/B9034]**.

[446] **[B10/B7249-B7252]**.

OTE slabs.[447]

(iv) Consistent with the rest of the CM team, Derek Ma explained that whilst there were various references to "*concurrently*", "*at the same time*" and "*monolithic*", he was most familiar with the term "*monolithic*",[448] and his understanding[449] of that term was based on the BD's PNAP APP-68 which states that "*[a]ll cantilevered structures should be cast monolithically with and at the same time as the directly supporting members. Construction joints should **not** be located along the external edge of the supporting members*"[450].

(v) Further, the ConE team[451] was copied into correspondence which reinforced its understanding of the design requirement, including: Lee Wan Cheung's email dated 24 July 2015[452] and response to TQ 33[453], which stated that "*the OTE wall must be concrete/pour together at the same time (monolithically) with the 3m EWL slab*"; and Rob McCrae's email dated 25 July 2015,[454] which was understood as confirming that the EWL and OTE slabs must be cast monolithically except for panels EM72 to EH74[455].

(vi) On the basis of the above correspondence and design reports, the CM team made the professional engineering judgment that the monolithic casting of the EWL and OTE slabs necessitated the trimming down of the east D-

[447] Paragraph 67 of the statement of James Ho **[B1/B342-B343]**.

[448] **[T27/130:1-6; 136:16-137:3]**.

[449] **[T27/133:21-134:1]**.

[450] See paragraph 2(a) and the diagrams in Appendix B of PNAP-APP-68 **[C16/C10768, C10773]**.

[451] Paragraph 64 of the statement of James Ho **[B1/B341]**; paragraph 40 of the statement of Derek Ma **[B1/B385-B386]**; paragraph 45 of the statement of Derek Ma **[B1/B368-B369]**; paragraph 40 of the statement of Louis Kwan **[B1/B385-B386]**.

[452] **[B10/B7512-B7513]**.

[453] **[B5/B2986-B2999]**.

[454] **[B10/B7254-B7255]**.

[455] **[T27/133:3-19]**.

walls[456]. This was a reasonable interpretation of "*monolithic*" in all the circumstances, especially since Leighton shared the same understanding[457].

(vii) In the light of the above professional judgment, Kit Chan explained that the use of through bars was implicit and was the only sensible thing to do once the top concrete and couplers had been removed[458]. This was particularly so having regard to TQ 34[459], which approved the use of through bars in the uppermost layer of the top mat as a solution to the vertical misalignment of couplers in the D-walls[460]. It was on this basis that the Second Change was developed and ultimately implemented in most of Areas B and C[461].

(viii) The above issues were expressly discussed and reported upon in a Weekly Report to MTRCL's then Project Manager, Brendan Reilly, for the week of 24 July to 30 July 2015[462].

167. Whilst the rational basis of the CM team's judgment is clear as a matter of fact, MTRCL acknowledges that the evidence discloses a lack of meaningful communication between MTRCL, Leighton and Atkins:

(i) The evidence of MTRCL's Design Manager, Andy Leung, is that he did not know about the Second Change until July 2018 – he considered that the CM team did not notify the DM team at the time, such that there was an issue of miscommunication[463].

---

[456] See the oral evidence of: Kit Chan at **[T26/50:3-10]**; James Ho at **[T27/9:2-10:12]**; Derek Ma at **[T27/118:22-119:1; 123:7-20; 142:18-25]**.

[457] See paragraphs 42 to 44 of the statement of Brett Buckland **[C27/C20810-C20811]** and his oral evidence at **[T23/150:11-20]**; paragraphs 36 to 37 of the statement of Justin Taylor **[C27/C20841-C20842]** and his oral evidence at **[T24/73:2-77:2]**; paragraphs 15 to 17 of the 2nd statement of Stephen Lumb **[C27/C20890-C20891]**.

[458] **[T26/50:23-52:12; 133:21-136:18]**.

[459] **[B16/B12527-B12528]**.

[460] See also paragraphs 40 to 43 of the statement of Kit Chan**[B1/B277-B278]**.

[461] With the exception of the 14 panels identified at paragraph 19 of the statement of Louis Kwan **[B1/B384-B385]**, where coupler connections were retained due to localised constraints.

[462] **[B16/B12540-B12547]**

[463] **[T25/122:7-123:5]**; **[T26/4:18-21]**.

(ii) In particular, Andy Leung explained that his email dated 25 July 2015[464] was referring to the construction joint between the OTE slab and the OTE wall, not the D-wall[465]. The considerable difficulty which the CoI had in understanding Andy Leung's explanation serves to illustrate how competent professionals could reasonably differ in their interpretation of that email.

(iii) Further, the evidence of Atkins' Lee Wan Cheung is that by "*monolithic*" he only intended that the OTE wall and the EWL slab on each side of the D-walls would be cast at the same time to ensure full tension anchorage for the 3m EWL slab[466]. Atkins' Rob McCrae also gave similar evidence[467].

(iv) It is noteworthy, however, that Lee Wan Cheung accepted that there was a bit of ambiguity in the term "*monolithic*"[468], and both he and Rob McCrae conceded that their interpretation of "*monolithic*" cannot be reconciled with the reference in paragraph 6.2 of report TWD-004B3 to the trimming of the top of the D-walls[469].

(v) The above demonstrates that a reasonable engineer with the same background knowledge could very well have interpreted Andy Leung's email and the term "*monolithic*" either way. At the end of the day, it evidences the lack of meaningful communication due to the use of ambiguous language at the time.

(vi) As Kit Chan very fairly accepted during the hearing, there is always room for improvement, including on communication, but some minor miscommunication is unavoidable given the pressures on a large project.

---

[464] **[B10/B7249-B7252]**.

[465] **[T25/123:16-126:7; 131:3-132:6]**.

[466] **[T34/30:12-34:7]**; paragraph 23 of the statement of Lee Wan Cheung **[J6/J4527]**.

[467] **[T36/153:11-154:8; 154:9-155:7]**.

[468] **[T34/33:20-34:7]**.

[469] **[T34/52:11-19]** and **[T36/156:13-157:15]**; see also Derek Ma's emphasis that TWD-004B3 contained a direct and express reference to the trimming of the top of the D-walls **[T27/138:13-142:1]**.

He acknowledged that the use of simple English and face-to-face discussions rather than emails may well avoid similar problems of miscommunication[470].

168. The miscommunication described above has unfortunately resulted in the absence of revised working drawings or formal design submissions to the BD. On this particular issue, the following key points are pertinent:

(i) Kit Chan's evidence is that he would prefer that the working drawings were updated at the time of the works, but there was no strict time limit. As such, he considered that it would be acceptable as long as the minor changes are incorporated by Leighton into a final amendment before the BA-14 submission for the EWL slab, in line with past practice[471] which has also been confirmed by TM Lee[472]. From a project management perspective, it would not be practical to have every minor change agreed by the BD before proceeding with the works, especially in the light of many more important issues at the time such as the underpinning works[473].

(ii) Consistent with Kit Chan's judgment at the time, Leighton's Justin Taylor (Risk and Revenue Recovery Manager) pointed out that the change from couplers to through bars was so minor that it would not necessarily be reflected on drawings[474], and Leighton's Brett Buckland (Senior Site Agent) took the view that the Second Change could simply be included in a final amendment submission[475].

(iii) Whilst Kit Chan and the CM team were aware of the corrective actions in the incident report[476] on the First Change (which was submitted to the BD

[470] **[T26/66:2-67:21]**.
[471] **[T26/42:4-44:20; 53:12-24; 54:25-55:20; 61:1-11; 63:24-64:1; 78:25-81:7]**.
[472] **[T32/38:15-39:3]**.
[473] **[T26/53:18-21; 64:1-16]**.
[474] **[T24/96:2-10]**.
[475] **[T24/4:24-5:17]**.
[476] **[H11/H5538-H5720]**.

on 29 July 2015)[477], that was not considered to be applicable because the First Change was a major change, whereas the Second Change was minor and in a different category[478]. Again, this was the CM team's professional judgment at the time, and whether one agrees in hindsight is another matter[479].

(iv) In any event, the absence of revised working drawings or design amendment submissions for the Second Change was ultimately due to Leighton's failure to submit a proper alternative design proposal to MTRCL to initiate the design amendment process. As Andy Leung explained[480], there should have been a formal work proposal from Leighton for changes to the permanent works, in line with Leighton's contractual obligation under clauses 7.1.1, 7.1.4 and 7.6.2 of the Particular Specification for Contract 1112[481].

(v) The proper procedure for alternative design proposals has been emphasised in the evidence of both the CM and DM teams[482], as well as the evidence of Atkins' John Blackwood and Rob McCrae[483], and it was the subject of a professional dialogue between Andy Leung and Leighton's Justin Taylor in the email chain of 19 to 20 October 2015[484]. Indeed, Leighton's Brett Buckland did not disagree with this procedure[485].

169. It bears emphasis, however, that there was never any intention on the part of

---

[477] See Jason Wong's evidence at **[T31/154:23-155:12]**.

[478] **[T26/120:8-121:16]**.

[479] As acknowledged by Jason Wong at **[T31/156:4-157:2]**.

[480] **[T25/121:15-122:5]; [T26/23:1-22]**.

[481] **[C3/C2209, C2217]**.

[482] Paragraphs 52 to 53 of the statement of Kit Chan**[B1/B281]**; paragraphs 20 to 22 of the statement of Andy Leung**[B1/B244-B245]**; paragraph 4 of the reply statement of Andy Leung**[B18/B24514]**.

[483] Paragraphs 61 to 62 and 99 to 100 of the statement of John Blackwood **[J1/J68, J75]** and his oral evidence at **[T33/72:15-75:10]**; paragraph 18 of the statement of Rob McCrae **[J4/J3347]**.

[484] **[C29/C21516-C21519]**.

[485] **[T24/3:23-4:23]**.

MTRCL to mislead or conceal:

(i) The BD was in receipt of design reports PWD-059A3 and above all TWD-004B3, as was Pypun[486]. They raised no specific objections or comments on the "*monolithic*" design assumption or the reference to the trimming of the D-walls[487], and Pypun's Ron Yueng accepted that any engineer reading paragraph 6.2 of report TWD-004B3 would have had no doubt as to the construction sequence which MTRCL and Leighton would adopt[488].

(ii) Indeed, BD expressly acknowledged the details of the permanent works in paragraph 15 of Appendix I to its letter dated 8 December 2015,[489] in response to design report TWD-004B3. As the Chairman pointed out and counsel for the Government accepted, "*[i]t's not as though there was simply darkness upon the land*".[490]

(iii) Pypun owes extensive obligations under its brief to conduct (amongst other things) audits and 'surprise checks' on construction sites on aspects of structural safety and integrity, and site inspections to identify irregularities, contraventions, or non-compliance with the building safety standards[491]. Pypun visited the site about once each quarter for three hours each time[492], and Pypun's Mak Yu Man accepted that the trimming of the east D-walls (as demonstrated by the photos put to him[493]) was not usual and would have been of interest to Pypun[494]. In MTRCL's submission, it is not credible to suggest that Pypun never observed the trimming of the east D-walls or the use of through bars (which works spanned almost six months) during its

[486] **[T25/101:3-102:19]**.

[487] As confirmed by Ron Yueng at **[T35/36:4-40:15]**.

[488] **[T35/65:2-67:5]**.

[489] **[B10/B7452]**.

[490] **[T2/113:19-21]**.

[491] See clause 6.6.4 of the brief contained in Agreement No.CE 7/2012 (HY) dated 20 August 2012. [**G9/G7665**]

[492] **[T34/137:14-138:5]**.

[493] **[B19/B25598, B25592, B25685, B25637]**.

[494] **[T34/138:7-151:14]**.

site visits.

(iv) As James Ho pointed out, given that the trimming down of the east D-walls was openly carried out over a few months, someone would have raised objections to the works if they were thought to be wrong, but no one has ever done so[495]. As far as the CM team was concerned, there was nothing objectionable about the Second Change, or any need to conceal or mislead.

170. Most importantly, despite the absence of revised working drawings, there are sufficient contemporaneous as-built records available. On this basis, MTRCL and Leighton were able to formalise the Joint Statement dated 16 November 2018 and the proposed design amendment drawings[496]:

(i) The totality of the records consists of extensive photographic records[497], design reports, various TQs and correspondence, layout plans and drawings, and also the bar bending schedules[498] disclosed by Fang Sheung. These records were reviewed and sanity-checked in the course of preparing the proposed design amendment drawings.

(ii) To take one concrete example, for the panels where coupler connections were retained due to the presence of underpinning frames, Kit Chan explained that the photos and shop drawings for underpinning works confirmed the location and connection detail[499].

(iii) Louis Kwan explained this[500] with reference to the photos of couplers retained at panels EH45[501] and EH48[502]. In fact, these contemporaneous

---

[495] **[T27/52:4-54:6]**.

[496] **[B19/B25480-15483]**, supported by the layout plans, proposed design amendment drawings and record photos in Annex A1/A2 **[B19/B25485-B25486]**, Annex B **[B19/B25487-B25493]** and Annex F **[B19/B25568-B25689]** respectively.

[497] **[B19/B25568-B25689]**.

[498] **[E2/E381-E3/E600]**.

[499] **[T26/56:18-59:12; 139:17-143:19]**.

[500] **[T29/99:16-105:1].**

[501] **[B19/B25569, B25574]**.

[502] **[B19/B25573, B25575, B25577]**.

photos demonstrate that Fang Sheung's bar bending schedule for these two panels was inaccurate, and this is a prime example of how record photos can be more reliable and accurate as-built records than drawings.

171. The proposed design amendment drawings will in due course be incorporated into the BA-14 submissions for the EWL slab which Leighton is contractually obligated to prepare[503]. As matters currently stand:

(i) The CM team has maintained as-built records throughout the course of the works in accordance with Exhibit 7.15 of PIMS PN/11-4/A4[504]. These records cover a wide spectrum of information including materials submissions, test reports and photographic records[505]. As-built material submissions[506] have been submitted in phases since February 2017[507].

(ii) As-built drawings have not yet been submitted by Leighton to MTRCL for review. Philco Wong pointed out that as-built drawings would have to wait for the final construction stage before consolidating all the information, and this would typically take three to four months leading up to project completion and handover[508].

172. Drawing the threads together, it is clear on the facts that the CM team made a judgment call as competent professionals to implement the Second Change as a minor change before working drawings were revised and any design submission was made to the BD. There was a lack of meaningful communication between MTRCL, Leighton and Atkins, such that the parties involved differed in their understanding.

---

[503] See clauses G15.4.1 and G15.4.2 of the General Specification **[C3/C2131];** clause Y8 of Appendix Y to the Particular Specification **[C4/C2842]**.

[504] **[B3/B1669]**.

[505] See paragraph 127 of Huyghe's Report **[ER1/2/34]**.

[506] See the as-built material submissions dated 13 February 2017 **[B5/TS31866]**; 19 April 2017 **[B20/B26072]**; 15 May 2017 **[B5/TS32930]**; 30 June 2017 **[B20/B26082]**; and 2 November 2017 **[B5/TS39560]**.

[507] Louis Kwan's oral evidence at **[T29/105:12-108:13]**.

[508] **[T32/121:9-123:5]**.

173. The 'domino effect' of these events culminated in a lack of follow-up action on drawing management and design submissions to the BD, particularly in the absence of an alternative design proposal from Leighton. Coupled with the fact that Leighton has not submitted as-built drawings, the inadequate documentation of the Second Change contributed to the inaccuracies in the June Report and coupler checklists.

174. MTRCL notes the Chairman's indication that the CoI is not prepared to determine "*what constitutes a permanent structure in terms of the regulations, what constitutes a major or minor structure in terms of the regulations*",[509] and MTRCL will not make any submissions on that issue and simply reserves its position.

175. However, when considering the project management aspects of the Second Change, it is relevant that the CM team considered this to be a minor change with a better, safer construction detail, particularly in the context of a very complex project with numerous more pressing matters[510] as highlighted by TM Lee[511].

176. MTRCL welcomes the Chairman's observation that the CoI has empathy for the very real challenges that the CM team faced on a day-to-day basis and will not impose unrealistic expectations[512]. Nevertheless, MTRCL accepts that there is room for improvement, and will address the PM Experts' observations below.

**VI(iv)(b) Observations of the PM Experts**

177. Huyghe observed that "*there appears to have been a miscommunication between MTRCL's DM and CM teams*", and "*if MTRCL's DM / CM team had clarified the revision at issue with each other, this whole issue may have been avoided. There were venues available […] such as through MTRCL's DM/CM weekly co-*

[509] **[T22/71:19-72:5].**

[510] See paragraph 73 of the statement of James Ho **[B1/B345-B346]**.

[511] **[T32/17:17-18:6]**.

[512] **[T26/80:14-22]**.

*ordination meetings*"[513].

178. Further, Huyghe noted that the DM and CM teams were both "*expecting Leighton to submit formal alternative design proposals for all changes made to the works. However, despite various prompts, Leighton did not submit anything for the change in connection detail, and so no revised working drawings to reflect this change were issued at the time*"[514].

179. Huyghe recognised that changes to suit site conditions were made based on the CM team's "*experience and professional judgment*", but he stressed that such changes "*must be clearly documented so that working drawings are prepared and can be reflected in the subsequent as-built drawings*"[515].

180. Accordingly, both PM Experts agreed that "*there was a lack of meaningful communications between MTRCL's DM and CM teams, Leighton and Atkins*", and that the Second Change "*should not have proceeded without approved working drawings*"[516]. They also agreed that it is Leighton's contractual obligation to progressively produce as-built drawings and records and submit them to MTRCL[517].

181. Huyghe specifically acknowledged that site photos "*are important and useful construction records*" and are "*always helpful if they are taken of work in progress, dated and the actual location noted*", such that they should be "*part and parcel of the overall as-built record*"[518]. This is supportive of the process by which MTRCL and Leighton prepared the Joint Statement dated 16 November 2018.

182. Overall, the PM Experts jointly recommended that[519]:

---

[513] Paragraphs 269 to 270 of Huyghe's Report **[ER1/2/61]**.

[514] Paragraphs 266 and 271 of Huyghe's Report **[ER1/2/60-61]**.

[515] Paragraph 272 of Huyghe's Report **[ER1/2/61]**.

[516] Paragraphs 12 to 13 of the JSPM **[ER1/9/T-2]**.

[517] Paragraphs 23 to 24 of the JSPM **[ER1/9/T-4]**; paragraph 138 of Huyghe's Report **[ER1/2/36]**.

[518] Paragraph 139 of Huyghe's Report **[ER1/2/36]**.

[519] Paragraphs 14 and 25 of the JSPM **[ER1/9/T-2;T-4]**; paragraphs 155, 169, 190 and 196 of Rowsell's Report **[ER1/1/80;82;85;86]**; item 3 of Table 3 of Huyghe's Report **[ER1/2/68]**.

(i) The liaison arrangements between the contractor's design team, the BD and MTRCL's DM and CM teams should be reviewed, in order to ensure that there is a common understanding of submission requirements and that all parties are aware of design issues.

(ii) BIM should be developed and implemented as a collaboration tool.

(iii) The documentation setting out as-built records requirements should be reviewed, and arrangements should be made to ensure that the records are submitted progressively and promptly.

**VI(iv)(c) Improvement measures already taken by MTRCL**

183. The improvement measures already adopted by MTRCL are set out in item 3 of Table 3 of Huyghe's Report, and the updated memorandum from Stephen Hamill[520].

184. The ongoing development of BIM as a collaboration tool is of particular relevance, and the Common Data Environment for BIM went live in December 2018 and will be trialled on SCL Contract C11081.

185. MTRCL is encouraged to see that the use of BIM is strongly supported by Rowsell, who explained that BIM carries significant benefits and would have assisted with the documentation of the Second Change and the keeping of as-built records[521].

## VII. REPORTING OF NON-CONFORMANCES

### VII(i) Factual evidence on reporting of non-conformances

186. Paragraph 1 of Exhibit 7.9 of PIMS Practice Note PN/11-4/A4 (Monitoring of Site Works) provides that a "*Works NCR is to report a nonconforming product which does not fulfil the specified requirements of a contract*" and "*where the*

[520] As appended to Mayer Brown's covering letter dated 22 January 2019.

[521] **[T39/116:18-118:3]**.

*nonconforming product is* ***significant and that corrective and preventive actions are required*** *to prevent recurrence of similar nature.*"[522]

187. Importantly, paragraph 3 of Exhibit 7.9 gives "*minor defects reported in routine inspections*" as an example of something which should *not* be the subject of a NCR under MTRCL's PIMS[523]. As explained by MTRCL's Senior Quality Assurance Engineer, CK Yeung, "*for minor defects, maybe within half a day or with making very little effort, you will be able to mend it, but minor defects are many and they will not attract NCRs. Usually, minor defects are dealt with by RISC forms*"[524] .

188. Paragraph 4 states that "*the CM team should encourage contractors raising their own Works NCR in accordance with their own QA/QC procedure*"[525]. This, as explained by Rooney, has been part of "*a push to try to get main contractors to be more proactive in terms of managing their quality management system over the years, even before [he] joined MTR*"[526].

189. The five occurrences of cut rebar threaded ends identified by MTRCL's Kobe Wong have been referred to above. The CoI has also heard evidence from Rooney and Kit Chan on the reporting of these occurrences:

    (i) Rooney agreed that one criterion for a NCR is "*significance*" which is subjective, but rightly stressed that there are other factors as well[527]. As Kit Chan explained, a NCR is a last resort and is not issued lightly[528], and the preference is to encourage contractors to issue its own NCR[529]. This is why NCRs are directed at non-conforming final products and not ongoing

[522] **[B3/B1660]**.

[523] As acknowledged in paragraph 205 of Huyghe's Report **[ER1/2/49]**, paragraph 90 of Rowsell's Report **[ER1/1/57]**, and paragraph 20 of the JSPM **[ER1/9/T-3]**.

[524] **[T31/105:6-16]**.

[525] **[B3/B1660]**.

[526] **[T28/41:19-25]**.

[527] **[T28/39:25-40:14]**.

[528] **[T26/68:19-23]**.

[529] **[T26/73:24-74:3]**; **[T28/41:19-22]**.

works in progress[530].

(ii) Kit Chan agreed with the Chairman's analogy that "*[i]f you can deal with it earlier, before there's any real concern, on site, quickly, then do so. If it's persisting then the NCR comes in almost like it's a yellow card saying, "You get one more and you're off for the entire project"*[531].

(iii) Further, Rooney explained that the Construction Manager was ultimately responsible for overseeing the close-out of contractor NCRs, with a log/register of NCRs accessible by quality assurance personnel[532]. According to Kit Chan, Leighton's NCRs are followed up by the IOWs to ensure that they are closed out by RISC forms[533].

(iv) Rooney accepted that the cutting of threaded ends could be regarded as a serious matter, but the experienced inspectors and engineers felt that they were in control of the situation and put it right[534]. Kit Chan similarly emphasised that minor defects in splicing assemblies are common[535], and he considered that the incidents were minor if one considers "*a more holistic picture*" of a small percentage of non-conformities in a section of the works with several thousands of couplers, and the fact that they were rectified on the same day[536].

(v) Therefore, on the five occurrences identified by Kobe Wong, Kit Chan summarised the position as follows:

> "*The first instance, he discovered less than five couplers had been spotted during the routine inspection and had rectified on the same day under MTR supervision. The same instance, similar things. But if*

[530] See paragraph 29 of the statement of James Ho **[B1/B328]**; paragraph 32 of the statement of Louis Kwan **[B1/B382]**.

[531] **[T26/72:5-17; 112:7-15]**.

[532] **[T28/43:3-44:9]**.

[533] **[T26/76:17-78:7]**.

[534] **[T28/109:10-110:6]**.

[535] **[T26/96:13-20]**.

[536] [**T26/109:9-111:12]**.

*you look at that, every bay we have hundred of couplers, we are talking about less than 1 per cent. […] we've got a checking system in Hong Kong that the inspector will go there continuously regularly, anything they discover, they rectify at the same time. Then on the third instance, because the number of discoveries is five number, that's why they elevate that one more step. They do it step by step […] After that, there may be two more minor incidents around the same time, but after that no more. That means probably the message passed to the sub-contractor or the relevant person […] that cannot do any more non-conforming work in coupler installation. […]*"[537]

190. Kobe Wong's recollection of the five occurrences has not been challenged[538], and there is consistent evidence on his judgment at the time:

(i) For the first occurrence, Kobe Wong explained that "*[i]n a routine site surveillance, I find non-compliance, and in this case Leighton made immediate correction, and also this was still bar fixing in progress. So my understanding was that it still did not constitute a serious mistake. So therefore, I defined it as a not so serious defect*"[539]. Kobe Wong only discovered non-compliant rebars lying on the ground on site, and he "*did not see someone using the non-compliant rebar in the installation*"[540]. The same applies to the second occurrence, which was also rectified immediately[541].

(ii) For the third occurrence which gave rise to Leighton's NCR 157[542], Andy Wong identified the non-compliant rebars and escalated the matter to his superior, Kobe Wong[543]. Kobe Wong's email dated 15 December 2015[544] to Leighton was copied to the ConEs, the IOWs/AIOWs, and his immediate superior, Pedro So (SIOW), and it was up to Pedro So to

[537] **[T26/69:20-70:20]**.
[538] **[T29/140:8-157:2]**.
[539] **[T29/142:11-16]**; **[T30/85:2-9]**.
[540] **[T30/90:17-22; 100:15-102:3]**.
[541] **[T29/147:15-148:16]**.
[542] **[B6/B4121-B4132]**.
[543] **[T30/125:14-128:9]**.
[544] **[B10/B7456-B7460]**.

escalate the matter[545].

(iii) Whilst Kobe Wong's email dated 15 December 2015 did not expressly request Leighton to issue a NCR, there was a "*mutual understanding*" that Leighton would try to resolve non-conformances first[546]. In any event, the tone of Kobe Wong's email was directing Leighton to raise its own NCR, and the fact that NCR 157 was raised is evidence that the system was working[547].

(iv) The fourth and fifth occurrences were very similar to the first two occurrences – they took place shortly after the third occurrence within two or three weeks, and Kobe Wong did not report the occurrences to anyone[548], the reason being:

> "*[…]For the fourth incident -- let's take that as an example.* ***After the third incident, where there was an NCR, how come there was still the fourth incident? […] it's possible that it could be different workers who caused the incident, so I had to observe further whether there would be more of such similar incidents.*** *[…] So we are talking about a relatively long period -- after the third incident in December 2015, there were the fourth and fifth incidents, in my experience, I thought it was acceptable, because already by the time we got to NSL, there were no more similar incidents. […]*"[549]

191. Therefore, the weight of the evidence summarised above supports the fact that the CM team broadly followed the PIMS procedure when handling the five occurrences identified by Kobe Wong. In particular, it was in line with the guidance in PIMS PN/11-4/A4 to encourage Leighton to deal with the problem immediately if possible and to raise its own NCR.

192. MTRCL acknowledges the one occasion in bay C1-5[550], where three non-

[545] **[T29/149:21-150:21]**.

[546] Kit Chan's oral evidence at **[T26/73:8-74:16]**.

[547] Rooney's oral evidence at **[T28/42:4-15; 108:14-109:2]**.

[548] **[T29/150:22-152:7; 153:13-19; 155:23-157:2]**.

[549] **[T29/152:13-153:8]**.

[550] **[T30/129:10-15]**.

compliant rebars could not be rectified because they were located in the lower portion of the top mat and concreting was in progress[551]. There was simply nothing that could be done, according to Andy Wong[552].

193. MTRCL accepts that it would be prudent to learn from these lessons and consider how appropriate prophylactic measures can be taken in response to a "*near miss*" in the future. Accordingly, MTRCL welcomes and are implementing the observations of the PM Experts on the NCR system.

**VII(ii) Observations of the PM Experts**

194. Huyghe fairly observed that "*non-conformance issues that are rectified immediately on-site following the specified procedure may not warrant the issuance of an NCR*"[553]. Indeed, as Rowsell rightly noted, a requirement for all non-conformances to be reported "*would create a high administrative burden and it may be sensible to have regard to the significance of the non-conformance*", although he acknowledged that each non-conformance offers an opportunity to prevent future occurrences[554].

195. Both PM Experts therefore agreed that "*an NCR need not be issued if the defective work is identified, corrected and immediately signed off on the same day*"[555]. Conversely, "*if it could not be remedied in one work day, then an NCR should be issued* "[556]. An NCR coming from the contractor is to be preferred, because "*an NCR coming from a contractor to their sub-contractors, there's a contractual relationship, and […] there may be more meat on the bones if you do it in that fashion* "[557].

---

[551] Paragraphs 33 to 34 of the statement of Andy Wong **[B1/B455]**; **[T30/139:3-5]**.

[552] **[T30/130:7-20]**.

[553] Paragraphs 208 to 209 of Huyghe's Report **[ER1/2/50]**.

[554] Paragraph 147 of Rowsell's Report **[ER1/1/77]**.

[555] Paragraph 22 of the JSPM **[ER1/9/T-4]**.

[556] Paragraph 211 of Huyghe's Report **[ER1/2/50-51]**.

[557] **[T39/32:16-23]**.

196. The above is consistent with Kobe Wong's decision not to issue an NCR for the five occurrences, on the basis that those defects were identified during site surveillance and rectified immediately[558]. As Huyghe observed, "*it is easy to use hindsight and zero in on this issue*", but "*[b]ased on the number of incidents and the intermittent timing between when these incidents occurred, being a month or more, one may understand why "at the time" if the defective rebar/coupler installations were immediately rectified, it may not have been a major issue on one's mind*" [559].

197. That said, as both PM Experts pointed out, even if an NCR need not be issued, "*all site supervision and construction engineering teams should be made aware of this defective work and put on notice. If such defective work occurs again, an NCR should be issued*" [560]. This was explored during the hearing, and Huyghe recommended that:

(i) It would be important to maintain communication of non-conformances between inspectors and engineers and to have a "*close working relationship*" – as Prof. Hansford rightly noted, this would very much be assisted by the daily use of digital platforms[561].

(ii) In future projects, spray paint of different colours could be a simple solution to show everyone on site which couplers were checked and acceptable and which ones were found to be defective[562].

198. If an NCR has to be issued by MTRCL or its contractors, "*[a]ny NCR that is received should be logged and tracked, and should not be taken lightly and requires the proper investigation and implementation of corrective measures*"[563].

---

[558] See e.g. Huyghe's oral evidence at **[T39/33:21-34:2]**.

[559] Paragraph 217 of Huyghe's Report **[ER1/2/52]**.

[560] Paragraph 22 of JSPM **[ER1/9/T-4]**; paragraph 216 and items 7 and 12 of Table 3 of Huyghe's Report **[ER1/2/51;74;79]**.

[561] **[T39/34:6-35:7]**.

[562] **[T39/28:14-30:6]**.

[563] Paragraph 212 of Huyghe's Report **[ER1/2/51]**.

As such, both PM Experts recommended that "*all NCRs received should be entered into a single NCR database*"[564]. MTRCL has already taken proactive steps in that direction.

**VII(iii) Improvement measures already taken by MTRCL**

199. The relevant improvement measures already adopted by MTRCL are set out in items 7, 8, 12 and 13 of Table 3 of Huyghe's Report, and Stephen Hamill's updated memorandum confirming the latest developments[565].

200. It is noteworthy that Rowsell is supportive of these proactive steps taken by MTRCL, and he has no doubt whatsoever that the improvements described by Stephen Hamill[566] has occurred or will occur[567].

## VIII. DEPARTURE OF SENIOR MANAGEMENT STAFF FROM MTRCL'S EMPLOYMENT

201. Following the June Report, Government lost confidence in MTRCL's senior management team and expressed a desire that they should leave. Contrary to speculation, their departure did not indicate MTRCL accepting that both it and the individuals in question bore responsibility for the defective steel works at the Hung Hom Station[568].

202. The evidence is that on Sunday 5 August 2018, the Chief Executive asked to meet Fred Ma the following morning, wherein Fred Ma was informed that Government had lost confidence in the SCL Project's management team and Government view was that the senior members of the Projects Team i.e. Philco Wong, TM Lee, Rooney, Jason Wong and also Lincoln Leong should leave[569] .

203. After the meeting, Fred Ma and Frank Chan, the Secretary for Housing and

---

[564] Paragraph 21 of the JSPM **[ER1/9/T-4]**; items 8 and 13 of Table 3 of Huyghe's Report **[ER1/2/75-76;79-81]**.

[565] As appended to Mayer Brown's covering letter dated 22 January 2019.

[566] **[ER1/2/Appendix D]**

[567] **[T39/186:1-189:9]**.

[568] MTRCL's Opening Submission at §111 **[OS/5/18-19]**.

[569] Fred Ma's Witness Statement at §§30-31 **[B1/B111]**; Frank Chan's Witness Statement at §33 **[G3/G1764]**; Frank Chan's oral evidence at [**T36/13:19-14:25]**.

Transport, met Lincoln Leong and Frank Chan conveyed the same message to Lincoln Leong. Lincoln Leong then agreed to retire early in view of recent developments on the SCL Project and Government's views. However, Frank Chan suggested that he should remain until a replacement CEO was found, and Lincoln Leong agreed[570].

204. Fred Ma concluded that MTRCL's Board should be aware of the issue and get involved in dealing with it, as well as considering measures to restore confidence in MTRCL's handling of the SCL Project. Accordingly, Fred Ma called a Special Board meeting for 7 August 2018 at which Frank Chan confirmed that Government had lost confidence in SCL's project management team and that MTRCL should consider whether the Projects Team's senior members should leave[571].

205. Lincoln Leong then reported that Philco Wong had tendered his resignation earlier that morning, and that a meeting that afternoon had been arranged with Rooney, TM Lee and Jason Wong when it was proposed to serve notice of termination on them[572]. Lincoln Leong also notified the Board that he would retire early as the CEO, but had been requested and had agreed to remain until a replacement CEO was found[573]. The Board unanimously agreed with these management changes.[574]

206. As explained by Lincoln Leong, in August 2018 when the senior projects management team was relieved of their duties, the CoI was just about to commence its evidence-gathering, and his view was it would have been much better to await the CoI's report before making a decision so that all the facts and

[570] Fred Ma's Witness Statement at §§32-33 **[B1/B111]**; Lincoln Leong's Witness Statement at §§57-59 **[B1/B128]**

[571] Fred Ma's Witness Statement at §§34-36 **[B1/B111-B112]**; Frank Chan's oral evidence at [**T36/15:1-11]**; Lincoln Leong's Witness Statement at §61 **[B1/129]**

[572] Fred Ma's Witness Statement at §37**[B1/B112]**; Lincoln Leong's Witness Statement at §61 **[B1/B129]**

[573] Fred Ma's Witness Statement §37 **[B1/B112]**; Lincoln Leong's Witness Statement at §62 **[B1/B129]**

[574] Fred Ma's Witness Statement at §37 **[B1/112]**; Lincoln Leong's Witness Statement at §§61-65 **[B1/B129]**.

information would be available and to allow the individuals concerned to address the matter[575].

207. However, while the Board and Government are separate[576], in reality MTRCL does a substantial amount of work with Government, which is its major shareholder and in the context of XRL and the SCL Project both the regulator and client. If Government lost confidence, it will be very difficult for these projects to be continued under the same management[577].

208. In any event, the evidence is clear that Government's loss of confidence in MTRCL's senior project management team related to the issue of someone taking (or being seen to take) responsibility for the inaccuracies in the June Report, rather than acceptance of responsibility for the alleged defective steel works at the Hung Hom Station[578].

209. Fred Ma put the matter succinctly in his oral evidence: "… *when the whole thing happened, the Chief Executive or for that matter the secretaries have never expressed any views about our management capability. It was after [the revelation of the inaccuracies in the MTRCL Report] that the government expressed that they have lost confidence*"[579]. This is consistent with Lincoln Leong's evidence. It was very much focused on the inaccuracies in the June Report as discovered subsequently, and at a time when there was no discussion about the cutting of threaded rebar founding Government's loss of confidence[580].

210. Indeed, Frank Chan confirmed that the inaccuracies in the June Report founded Government's loss of confidence in MTRCL's management[581], explaining during his oral evidence that Government expected the June Report had been put together

[575] Lincoln Leong's oral evidence at **[T32/146:10-147:3]**.
[576] Fred Ma's oral evidence at **[T33/29:15-30:5]**.
[577] Lincoln Leong's oral evidence at **[T32/149:16-150:3]**.
[578] **[T36/5:9-8:4]**
[579] Fred Ma's oral evidence at **[T33/23:24-24:17]**.
[580] Lincoln Leong's oral evidence at **[T32/144:24-145:17]**
[581] **[T36/4:6-8:4]**

stringently and accurately, but inaccuracies were later discovered.[582] Frank Chan also stated that "*[i]f we have entrusted a team, a project to such a team, and if that's the performance they have delivered, then you would wonder whether the basis of trust is still there…**If** there's anything that may affect public safety or structural safety, it would certainly not be acceptable to us*[583]." Frank Chan made no reference in his evidence to the alleged defective steel works founding Government's loss of confidence.

211. Notably, neither was Philco Wong's resignation related to his accepting any responsibility for the alleged defective steel works, as he explained[584] he resigned on 7 August 2018 because of: (i) medical reasons: and, (ii) the fundamental change of his role in MTRCL since late May 2018 from a technical role as a professional engineer to having regularly to consider issues from a corporate publicity and political perspective. He further explained that his resignation was unrelated to other people's view on MTRCL's management and project teams[585].

212. Accordingly, the summary departure of MTRCL's senior management staff should not in any way be construed as MTRCL and/or the individuals in question accepting responsibility for the alleged defective steel works at the Hung Hom Station.

Dated 22nd of January 2019.

Philip Boulding QC
Jat Sew-Tong SC
Kaiser Leung
**Counsel for MTRCL**

[582] **[T36/4:18-23]**

[583] Frank Chan's oral evidence at **[T36/6:11-7:9]**.

[584] Philco Wong's witness statement at §§48-50 **[B1/152-153]**.

[585] Philco Wong's oral evidence at **[T32/79:25-80:7]**.