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

CLOSING SUBMISSIONS FOR ATKINS CHINA LIMITED

22 January 2019

INTRODUCTION

1. Atkins China Limited ("Atkins") became an Involved Party in the Commission of Inquiry ("the Commission") into the Diaphragm Wall and Platform Slab Construction Works at the Hung Hom Station Extension under the Shatin to Central Link Project ("the Project") in response to the Commission's letters issued on 2 October 2018[1] and 15 October 2018[2] (the latter of which is referred to as "the Salmon Letter").

2. Atkins' role in the Project was as the detailed design consultant for MTR Corporation Limited ("MTRCL") ("Contract C1106")[3] where it provided what became known as Team A ("Team A") and also as the technical advisor for the contractor Leighton Contractors (Asia) Limited ("Leighton") ("Contract 1112")[4] where it provided what became known as Team B ("Team B") (which together are defined as "the Contracts").

[1] J1-J9.
[2] J10-11.
[3] B7652-B8218.
[4] J16-J54.

3. Atkins has served five (5) witness statements and a number of accompanying exhibits.[5] Atkins has also assisted the Commission by responding to a number of additional requests for information.[6]

4. These Closing Submissions have been prepared in response to the issues raised in the Salmon Letter as well as criticisms raised and observations made during the course of the Commission.

STRUCTURE OF THESE CLOSING SUBMISSIONS

5. These Closing Submissions deal with the following matters:

5.1 The deviation in the as-built condition of the connection of the east D-wall ("the D-wall") with the EWL slab from that originally designed:

5.1.1 Atkins' roles and responsibilities in the Project as both the detailed design consultant for MTRCL and also as the technical advisor for Leighton; and in particular -

(a) Did this give rise to any perceived or actual conflict of interest;

(b) Was there sufficient separation of Atkins' personnel as between Team A and Team B; and

(c) Approval of additional services which involved the permanent works under Atkins' contract with Leighton.

[5] Mr John Blackwood [J56-J77] with exhibits [J78-J3343]; Dr Robert William McCrae [J3344-J3356] with exhibits [J3357-J3361] and corrigendum [J3356.1]; Mr Chan Chi Kong [J4502-J4507] with exhibits [J4508-J4522]; Mr Lee Wan Cheung [J4523-J4529] with exhibits [J4530-J4534]; and Mr Sung Chi Man [J4535-J4541] with exhibits [J4542-J4545].

[6] On design reports [J3362-J4062]; shear key [J4063-J4498]; further witness statements [J4499-J4545]; shear links [J4546-J4553]; PowerPoint slides to Professor Nethercot [J3323-3343]; and calculations in relation to first and second changes [J4555-J4567].

5.1.2 Atkins' involvement in the first change[7] ("the First Change") and second change[8] ("the Second Change") in connection details for the D-wall and the EWL Slab; and

5.1.3 Communication among the Construction Management Team of MTRCL, the Design Management Team of MTRCL, Leighton and Atkins; including

(a) Technical Query 33 ("TQ 33"); and

(b) Technical Query 34 ("TQ 34").

5.2 Preparation of as-built drawings and obtaining Buildings Department ("BD") approval:

5.2.1 Atkins' role in obtaining the approval of BD in relation to the First Change –

(a) Atkins' role in the preparation of as-built drawings for the D-wall and the First Change;

5.2.2 Atkins' role in obtaining the approval of BD in relation to the Second Change –

(a) Atkins' role as to the as-built drawings for the EWL Slab and the Second Change; and

(b) Atkins' role in the BD process in relation to the Second Change.

[7] Changes to the reinforcement at the top of the D-wall, where there was an omission of the steel reinforcement U-bars at the top of the East D-wall.
[8] Changes to the top of the D-wall by trimming the D-wall and using straight-through bars instead of couplers for the top reinforcement.

5.2.3 Whether or not the parties should have taken steps to seek approval from the BD in relation to the Second Change.

5.3 The permanent works design:

5.3.1 Observations as to conservative nature of the design of the reinforcement for the EWL Slab and NSL Slab;

5.3.2 The shear stress calculations submitted by Atkins; and

5.3.3 The safety and integrity of the structure.

5.4 Knowledge of re-bar cutting and defective coupler connections:

5.4.1 Knowledge of the cutting of threaded steel reinforcement bars and the defective coupler connections for D-walls to slab and slab to slab during the construction period on site.

5.5 Observations for future complex infrastructure projects in Hong Kong:

5.5.1 To consider the allowance of an on site presence for the design consultant; and

5.5.2 To consider the development of a conflict of interest policy and a conflict of interest committee.

DEVIATION IN THE CONNECTION OF THE EAST D-WALL WITH THE EWL SLAB

Atkins' roles and responsibilities as both the detailed design consultant for MTRCL and also as the technical advisor for Leighton

(a) Did this give rise to any perceived or actual conflict of interest?

6. A suggestion was made during the course of the Commission that there existed an actual or perceived conflict of interest[9] because Atkins acted as both the detailed design consultant for MTRCL (Team A) and as a technical advisor for Leighton (Team B).

7. At no time was there any actual conflict of interest nor any conflict of interest perceived[10] by any party during the time of the Project between April 2013 and September 2018.

8. For a complex Project which was procured on a collaborative basis,[11] there were benefits in their dual role in terms of synergy between the supporting design consultancy personnel and project knowledge.

9. The possibility of a dual role was envisaged during the tender period and agreed by MTRCL.[12]

[9] Commissioner Hansford [T33/65-68]; Mr Yueng Wai Hung Ron [T35/10-17]; Mr Steven Albert Huyghe [T39/63-82]; Mr Stephen Gordon Rowsell [T39/146-173]; Expert Report of Mr Rowsell, para 53 [ER1, Tab 1, 42]; Expert Report of Mr Huyghe, paras 140 and 143 [ER1, Tab 2, 36] and Joint Statement of Project Management Experts, para 15 [ER1, Tab 9, T-3].

[10] The question of a "perceived" conflict of interest has only arisen during the course of the Commission and not at the time of the Project.

[11] The method of procurement approach adopted by MTRCL was a "Target Cost", which is a collaborative procurement approach.

[12] Agreed by Mr Huyghe [T39/72-73] and Mr Buckland [T24/52].

10. Evidence has been presented before the Commission that this dual role has been used on other MTRCL contracts such as 1106, 1112, 1114 and 1123.[13]

11. The evidence which Atkins relies upon is as follows:

11.1 There was never any suggestion of conflict of interest by any party with reference to Atkins throughout the course of the Project. [14]

11.2 It was "*a situation where MTRC have taken [Atkins] first, Leighton wished to engage [Atkins], which they did, and MTRC didn't put up a fight about that*".[15]

11.3 Project management expert Mr Rowsell agreed that the existence of actual conflict of interest is not one for which there is evidence[16] and he accepted that "*there is no evidence that anyone at any stage articulated that perception [of conflict of interest]*".[17]

11.4 Mr Rowsell agreed that there were benefits of the dual role supporting contractor and project owner working together on complex and demanding projects.

11.5 Project management expert Mr Huyghe agreed that "*there is no evidence that has been shown to [him] that suggests anyone has been acting with either actual or perceived conflict of interest*"[18] and that "*[he has] got no*

[13] Mr Huyghe [T39/75-77]; Mr Rowsell [T39/137-139, 151-152 and 156]; Mr Yueng [T35/12-13] and G7169.
[14] Mr Blackwood [T33/83-85].
[15] Mr Pennicott, Counsel for the Commission [T33/68].
[16] T39/154.
[17] T39/154-156. See also T39/154, when Mr Rowsell was talking about conflict of interest and the perception of conflict of interest and said that he "*not suggesting in any way that any of [Atkins'] individuals acted inappropriately or influenced as a result of [potential] conflicts*".
[18] T39/89-90. See also T39/81.

evidence to say that there was a conflict, just that the arrangements provided the opportunity for it or a perceived conflict".[19]

11.6 Mr Brett Buckland of Leighton agreed that there was synergy between the Atkins teams when he said that "*[there was no concern] to Leighton about any potential conflict of interest at the relevant time*"[20] and "*the perception of some people is that, you know, there may be a conflict of interest, but I personally think it's gone very well*".[21]

11.7 Mr Buckland replied to a question from Commissioner Hansford about perception of conflict of interest, stating that it was just a perception of a conflict of interest in recent months and it was not made during the course of the works.[22]

11.8 Mr Buckland of Leighton said that "*there was at least one case where we did an alternative design and used the synergy by having Atkins/DDC, team A, to do the actual design submission to BD*" and that "*[t]here were many cases where it clearly helped a lot to have the history of many of the staff in the team ... whereas a separate consultant would have to redo everything*".[23]

11.9 Mr Justin Taylor of Leighton referred to Mr Buckland and said "*we were trying to make sure that glass walls weren't appearing when they didn't need to be there, we could actually get technical information easily transposed across the two teams, so that we could effectively build the works*".[24]

[19] T39/171.
[20] T23/187-188.
[21] T24/43 and 57-58/16.
[22] T24/58-59.
[23] Mr Buckland [T24/52 and 57-59].
[24] T24/86-87.

11.10 Mr Blackwood of Atkins said that "*there were advantages in having a central coordination of the teams*".[25]

11.11 MTRCL anticipated that the same company might be employed as the detailed design consultant for MTRCL and also as technical advisor for the contractor. Condition Y3.8 of Contract C1106 states that "*[t]he Consultant shall avoid the situation of conflicts of interest that may arise should the Appointed Tenderer wish to engage him as his technical adviser*".[26] As such, Atkins being both the detailed design consultant for MTRCL and Leighton was envisaged at the time of the appointment of the consultancy agreement.[27]

11.12 Mr Rowsell accepted that employing the same design consultancy in a dual role was "*[u]nusual but not unknown*"[28] and he confirmed "*that a similar arrangement whereby the designer and the consultant might work for the procurer and the contractor*"[29] on Crossrail in the UK.

11.13 Mr Yueng Wai Hung Ron of PyPun stated "*Pypun did review the responses [of the audit in December 2015] and reported back that there did not appear to be a conflict, or at least not one that was not protected by different teams and walls*".[30]

11.14 MTRCL's agreement to Atkins supporting both MTRCL and Leighton at item 3.4 in the minutes of meeting dated 8 May 2013[31] and in Leighton's

[25] Witness Statement of Mr Blackwood, para 16 [J60].
[26] B8214.
[27] Mr Buckland [T23/186] "*... [Leighton] did actually talk to MTR about whether they thought it was acceptable and they agreed it was acceptable*". See also T39/66-67, which was accepted by Mr Huyghe.
[28] T39/148.
[29] T39/151. He also noted the project had a conflict of interest policy, panel / committee, etc.
[30] Mr Yueng [T35/12-13].
[31] B7550-B7552.

"Supplier / Subcontract Report" approved by MTRCL on 10 April 2015.[32]

11.15 MTRCL paid Leighton for Atkins' Team B design services in interim payments under the Fee[33] in the Conditions of Contract for Target Cost Construction in relation to the Shatin to Central Link Entrustment Agreement ("Main Contract").

11.16 The Chairman clarified with regard to potential conflict of interest, under the cross-examination of Mr Rowsell, that "*I don't think, with respect, that it's being said here by Mr Rowsell that these dangers necessarily presented themselves and were not properly dealt with in fact*".[34]

11.17 Finally, no evidence was received or heard by the Commission to suggest that either directly or indirectly, the dual appointment arrangement had caused or contributed to any of the matters being considered by the Commission under its Terms of Reference.

Proposed finding

12. There was no actual or perceived conflict of interest in the services carried out by Atkins under both Contract C1106 and Contract 1112; and there is no connection between the dual appointment and any of the matters concerning the Commission under the Terms of Reference.

[32] B7517.
[33] C3/1978.
[34] T39/171-172.

(b) Was there sufficient separation of Atkins' personnel as between Team A and Team B

13. It was suggested that there was no clear separation between Team A as the detailed design consultant for MTRCL and Team B as the technical advisor for Leighton.[35]

14. There existed from the outset an intention to keep the teams separate; and they worked on separate floors[36] and with a few isolated exceptions, caused by the demands of the complexity and programme of the Project, this was achieved.[37]

15. It was expected from the outset that the teams would benefit from having lines of communication. It is accepted that at a senior level, there was a small degree of overlap which allowed for better management of the design and these senior people were aware of the responsibilities. However, later in the Project, due to the increase in work scope as there was an increased need for interfacing between the teams.[38]

16. Notwithstanding this, "*the formal process ... was always followed*"[39] in that Team B prepared submissions which were passed to Leighton, in turn to MTRCL's Construction Management Team and then on to MTRCL's Design Management Team; reaching latterly Team A for their review. The existence and robustness of this process was confirmed by Mr Andy Leung of MTRCL.[40]

---

[35] Witness Statement of Mr Buckland, FN 3 [C20804]; 2nd Witness Statement of Mr Buckland, para 14 [C24023]; Mr Rowsell [T39/169] and para 60, Expert Report of Mr Rowsell [ER1, Tab 1, 47].
[36] Mr Lee [T34/52].
[37] Mr Blackwood [T33/83-84].
[38] Mr Buckland [T24/51-59] and Mr Blackwood [T33/60-66]. Mr Lee considered "*there is definitely a difference*" between the teams [T34/7].
[39] Mr Buckland [T24/55] and Mr Blackwood [T33/84].
[40] T25/111.

17. The "*small overlap*" as between Team A and Team B was not significant in a design team of over 300 people.[41] Those senior Atkins' people were clearly aware of their respective responsibilities[42] and were not challenged on this. Their roles aided in the understanding of the design issues as between the parties and so assisted in resolving design issues.[43]

18. MTRCL, Leighton and Atkins all concur as to the benefits in this arrangement, creating "*synergy*" between the design teams and drawing from Atkins' knowledge as the original designer and therefore with an in-depth history and knowledge of the Project which allowed for the faster resolution of design issues.[44]

19. At no time during the course of the Project was there articulated any complaint about a lack of appropriate separation between Team A and Team B.[45]

20. Finally, no evidence was received or heard by the Commission to suggest that either directly or indirectly, the extent of separation of Atkins' personnel as between Team A and Team B had caused or contributed to any of the matters being considered by the Commission under its Terms of Reference.

Proposed finding

21. The small overlap between Team A and Team B did not cause or contribute to any of the matters being considered by the Commission under its Terms of Reference.

---

[41] Mr Huyghe [T39/79-80] and Mr Rowsell [T39/170-173].
[42] Witness Statement of Mr Blackwood, para 23 [J62] and Mr Buckland [T24/56-57].
[43] Mr Rowsell [T24/54-55].
[44] Mr Buckland [T23/185-188] "*[t]he main purpose was because we expected there would be a synergy between our design and the DDC's design checking, because they are effectively the same team, and they have all their history and knowledge of the job already…*" and Mr Blackwood [T33/63-64].
[45] Mr Blackwood [T33/60-61].

Approval of additional services which involved the permanent works under Atkins' contract with Leighton

22. An observation arose quite late in evidence that because the services scope of Atkins Contract 1112 (Team B) increased and included considerations of the permanent works, there should have had specific approval from the Engineer.[46]

23. The observation from Mr Rowsell went on to suggest that this approval was never given by the Engineer in accordance with the Contract(s) by reference to Clauses 5.1 and 5.3 of the Main Contract.[47]

24. The evidence is that the services under Contract 1112 with Leighton increased to include over 200 additional items and that Atkins' consultancy value increased by over 400%.[48]

25. Atkins' position is as follows:

25.1 If any approval was required of the Engineer for any revisions to the scope of Contract 1112, Atkins had no responsibility to obtain it;

25.2 While a requirement appears to have been made by the Engineer in May 2013, Atkins was not at this meeting[49] and it was not incorporated into Contract 1112;

25.3 In any event, as a matter of contractual interpretation, Clauses 5.1 and 5.3 of the Main Contract[50] referred to by Mr Rowsell refer to "Works"[51] which does not include consultancy services;[52]

[46] Expert Report of Mr Rowsell, paras 53-54 [ER1, Tab 1, 42-43].
[47] C1831-C1832 and Expert Report of Mr Rowsell, para 53 [ER1, Tab 1, 42].
[48] Witness Statement of Mr Blackwood, paras 12 and 24 [J58-59 and J62].
[49] See B7550-B7551.
[50] C3/1831.
[51] See Clause 1.1.79 of the Main Contract [C1825]. See also relevant Definitions in Clauses 1.1.33 (Execution of the Works), 1.1.54 (Permanent Works) and 1.1.72 (Temporary Works).

25.4 Further and in any event, the original Contract 1112 between Atkins and Leighton was not solely based on temporary works as the scope of service;[53]

25.5 If Team B's services required the express approval for the Engineer for any adjustment or extension (whether or not they related to the permanent works) then it should be clearly stated in either Contract C1106 or Contract 1112 and it was not;[54]

25.6 The appointment of Atkins under Contract 1112 which was signed off by MTRCL on 27 March 2015[55] included no requirement that Team B services regarding the permanent works needed the express approval of the Engineer;

25.7 MTRCL was aware through the involvement of the Engineer's Representative of Atkins Team B's additional services.[56]

26. The evidence which Atkins relies upon is as follows:

26.1 Mr Rowsell agreed that if any approval was required for any subsequent revisions or inclusion of services regarding the permanent works for Contract 1112 this approval should have been obtained by Leighton and not Atkins;[57]

26.2 Atkins was not involved in the meeting where the requirement was stated on 8 May 2013[58] and was never made aware of this requirement;

---

[52] This is a matter that was put to Mr Rowsell in a colloquial way as he was not asked his contractual interpretation (which would be a matter of submissions) [T39/165-166].
[53] J46-J48.
[54] T39/165.
[55] B7517.
[56] Witness Statement of Mr Clement Ngai, para 11 [B1/17]. See also Mr Rowsell [T39/169].
[57] T39/164.
[58] See B7550.

26.3 Clauses 5.1 and 5.3 of the Main Contract[59] they are not applicable to this issue and do not relate to an approval by the Engineer for a redesign of the permanent design;

26.4 The original Contract 1112 between Atkins and Leighton was not only based more than "*temporary works*" can be found at the scope of service at section of the Contract.[60] This includes changes to design of the permanent works in the form of various feasibility studies.

26.5 Some examples include "*combining individual pile caps into a continuous pile cap on both sides of the cofferdam*",[61] "*feasibility design for alternative foundation for Accommodation buildings*"[62] and "*feasibility study on alternative foundation for Cheong Wan Rd viaduct [by exploring] options of using pre-bored H-piles in place of bored piles*";[63]

26.6 Mr Rowsell agreed that if the Team B services involved a redesign of the permanent design it would need a clear condition in the contract from the Engineer – however, there is no such provision;[64]

26.7 At all times MTRCL was aware of Atkins' additional services and that they were considering aspects of the permanent works. There was no objection from the Engineer or those to whom his duties were delegated. For example:

26.7.1 Atkins Team B prepared Permanent Works Design submissions (such as PWD-059 as discussed below);[65]

[59] C3/1831.
[60] J46-J48.
[61] J47.
[62] J48.
[63] J48. These issues were put to Mr Rowsell who disagreed and said that "*changes to the permanent works may be required, not that it undertakes the permanent works design*" [T39/161].
[64] T39/165.

26.7.2 Mr Rowsell accepted that MTRCL was aware that Atkins' services included redesign of the permanent works;[66]

26.7.3 MTRCL paid Leighton for these additional services which included redesign of the permanent works in the Fee[67] under the Main Contract with Leighton;[68] and

26.7.4 The Engineer was aware also of the additional services through the involvement of the Engineer's Representative in communications among MTRCL, Leighton and Atkins.

27. Finally, no evidence was received or heard by the Commission to suggest that either directly or indirectly, the manner in which the scope of Atkins Team B services was extended, caused or contributed to any of the matters being considered by the Commission under its Terms of Reference.

Proposed finding

28. It was not Atkins' obligation to obtain approval from MTRCL to the extension of Atkins Team B's scope; but in any event, the extension did not require formal approval from the Engineer. Insofar as approval was required, it was provided informally by those to whom the Engineer had delegated authority. Finally, the manner of the extension of scope did not cause or contribute to any of the matters being considered by the Commission.

---

[65] See Atkins' logo on the PWD-059A submission [C21765].
[66] T39/167.
[67] C1978.
[68] See C1978 and Clause 5.1.

Atkins' involvement in the (a) the First Change and (b) the Second Change in connection details for the D-wall and the EWL Slab

(a) The First Change

29. The First Change was instigated by Intrafor through Leighton to improve the constructability of the D-walls. Atkins only became aware of the First Change once the D-wall had been built and they were issued the as-built drawings for review.

30. Once the First Change had been identified, Atkins Team B was asked by Leighton to prepare design calculations and a design submission in order to justify that the omission of the U-shaped bars ("U-bars") at the top of the D-wall would not be detrimental to the structural integrity of the D-wall and the overall design of the Station Box.

31. It was agreed by Mr Kevin Yip of MTRCL[69] to include the justification for this change in a PWD submission[70] (which later became PWD-059A3[71] and addressed the as-built reinforcement to the D-wall and insufficient anchorage for the tension reinforcement of the EWL Slab).

32. The evidence which Atkins relies upon is as follows:

32.1 The First Change was accepted by all parties including BD as PWD-059A3 which was forwarded to BD on 30 July 2015[72] and approved on 8 December 2015[73] and on 28 April 2016[74] and formed the basis of working drawings for construction.

[69] J1667-J1668. In the email, "*him*" refers to Mr Yip [T23/132].
[70] The document was titled "Discussion on Design Amendment Works D-wall [Deliverable No. PWD-059A3]".
[71] C21765-21799.
[72] C21758.
[73] C24/17998.
[74] C26/20002.

Proposed finding

33. The as-built drawings for the D-wall identified the need for an amendment submission to BD. Atkins supported in achieving retrospective acceptance by BD of the First Change and the issue of updated working drawings to reflect it.

(b) The Second Change

34. Atkins became aware of the Second Change after 12 June 2018. Atkins was not on site when the Second Change is understood to have been made and was not a party to any conversations regarding the Second Change.

35. It has been suggested in the evidence that the basis of the Second Change is to be found in certain TWD submissions prepared by Team B and the responses to the Technical Queries ("TQs") 33 and 34.

36. Atkins prepared the TWD submissions which included Draft TWD-004B2 submitted to Leighton[75] which referred missing U-bars[76] in the D-wall and the top of the D-wall being trimmed down.[77] It appears that the draft TWD-004B2 was never formally submitted by Leighton to MTRCL or Team A. Team A was never asked to review or comment on TWD-004B2 or discuss it with BD.[78]

[75] C10847.

[76] At paragraph 1.3.5 [J106] it contains an explanation of secondary measures for the provision of additional rebar at mid-span due to missing U-bars in the D-wall.

[77] At paragraph 6.2 [J142] it refers to the top of the D-wall being trimmed down and the top rebar of the EWL slab at the diaphragm panel will then be fixed to the top rebar of OTE slab to achieve full tension laps and the EWL slab and OTE slab will be cast concurrently with temporary openings around the existing columns and pile caps.

[78] Mr Buckland agreed that TWD-004B2 was never submitted to BD [T24/19]. Mr Leung "*did not see this version of the report*" [T26/6].

37. Atkins' Team B also prepared TWD-004B3 (which was a revision of TWD-004B2).[79] The objective was to enable the execution of the works to -0.5mPD to commence to produce the temporary load cases in relation to the EWL and NSL slabs. TWD-004B3 was not intended to be a submission for a change to a permanent works design. It provided insufficient detail for that purpose.

38. The evidence which Atkins relies upon is as follows:

38.1 There is no evidence that TWD-004B2 was ever formally submitted by Leighton to MTRCL Design Management Team or Team A.[80] This was also agreed to by Mr Andy Leung.[81]

38.2 Both TWD-004B documents refer to "*excavation and lateral support*" which consists of temporary works to enable excavation to commence and were not permanent works submissions.[82]

38.3 There was an agreement to remove the permanent change which was the U-bar at the top of the D-wall at paragraph 1.3.5 to TWD-004B2 on 23 May 2015 which is referred to in email discussions between Edward Tse and Betty Ng so as "*not to confuse BD and complicate the issue*" and to allow the initial bulk excavation to start.[83] It is also clear that on 27 May 2015, this was discussed and agreed with MTRCL.[84]

38.4 When Atkins Team A issued PWD-059A which justified the basis of the First Change to the original design, it did not refer to any breaking down of the D-wall. Also, it is clear from the detailed sections in the

[79] J1675-J3303.
[80] Witness Statement of Mr Blackwood, para 70 [J69] and Witness Statement of Mr Leung, para 50(a) [B253]. See also Mr Lee of Team A who said "*I haven't seen this report*" [T34/27].
[81] T26/6.
[82] Mr Buckland [T24/32] and Mr Ma Ming Ching of MTRCL who states temporary works and permanent works submission "*self evidently for different purposes*" [T27/134].
[83] C10842.
[84] B24519.

associated drawings, it did not refer to any trimming or breaking down of the D-wall.[85] Mr Leung was not aware of the change and it was not included in the working drawings to BD.[86]

38.5 Following the issue of PWD-059A3, Atkins Team A then prepared DAmS 310 which updated the original design and going through the process of getting BD approval.[87] The working drawings therefore reflected the position as approved by BD based on couplers and no breaking down of the D-wall.[88]

38.6 These working drawings were never subsequently revised to reflect the work now understood to have been constructed in the Second Change.[89] Dr McCrae stated in his witness testimony that in his profession, drawings and designs would always take precedence over any statement.[90] In cross-examination, Mr Rowsell agreed that the work should never have proceeded without working drawings.[91]

38.7 As noted above, Atkins became aware of the Second Change after 12 June 2018. Atkins was not on site when the Second Change is understood to have been made and was not a party to any conversations regarding the Second Change.

38.8 Atkins did not have any site team and therefore did not know about the trimming or hacking of the D-wall and the Second Change.[92]

---

[85] B7428.
[86] T25/122-123.
[87] Witness Statement of Mr Blackwood, paras 90-92 [J73-74]; and Witness Statement of Mr Leung, paras 41-45 [B250-252].
[88] Witness Statement of Mr Lee, para 39 [J4529] and [T34/56-57] agreed by Mr Chan [T26/132-133] and there is no breakdown referred to in the associated drawing [B7428] (see sections).
[89] Mr McCrae [T36/157].
[90] T36/157.
[91] T39/178.
[92] Witness Statement of Mr Blackwood, para 87 [J73].

38.9 Atkins' contracts with both MTRCL and Leighton did not require it to have any site presence nor supervision responsibilities.[93] Atkins' Team B was never requested by Leighton to assist in any preparation of a submission for the Second Change.

38.10 It has been suggested that it is inconceivable[94] that people on site (which by implication would have included Atkins) were not aware of the Second Change at the time. However, there is simply no evidence that Atkins was ever advised / informed of the Second Change until they received the as-built drawings after 12 June 2018.[95]

Proposed finding

39. Atkins was not involved in the Second Change and had no knowledge of until after June 2018.

[93] Witness Statement of Mr Blackwood, para 14 [J59].
[94] Mr Huyghe [T39/95]. This was in reply to a question by Commissioner Hansford and in the context of lack of communication and his view that there must have been conversations around hacking of the D-wall on site.
[95] Witness Statement of Mr Blackwood, para 104 [J76]. See also Mr Lee [T34/57].

Communication issues and the extent if any to which they caused or contributed to matters being addressed by the Commission

40. It has been suggested that there was a breakdown in meaningful communications among MTRCL's Construction Management and Design Management teams, Leighton and Atkins.[96]

41. Any breakdown of communication with regard to the Second Change appears to be a matter between MTRCL's Construction Management and Design Management teams and did not involve Atkins. This was accepted by Mr Rowsell who agreed that "*the communication problem was one between the design management team and the construction management team of MTR*" and said that "*Atkins weren't involved*".[97] Mr Huyghe also accepted that "*the problem, as far as [he is] concerned, lies between the CM and DM teams in MTR*".[98]

42. It is suggested that use of the words "*monolithic*", "*at the same time*" and "*concurrently*" in certain communications, such as TQ 33 and TQ 34, from Atkins were construed by MTRCL's Construction Management Team and Leighton in such a way as entitled them to effect the Second Change. However, this was not the design intent. The design intent continued to be represented in the working drawings which had been issued and reflected the approvals from BD.

Technical Query 33 ("TQ 33")

43. On 27 July 2015, Leighton raised TQ 33 to Team B[99] which referred to the design of the OTE wall and EWL Slab connection requirement. TQ

[96] Para 12, Joint Statement of Project Management Experts [ER1, Tab 9, T-2] "*[w]e agree that, even though interactions had occurred, there was a lack of meaningful communications between MTRCL's DM and CM teams, Leighton, and Atkins*"; and T39/62, 83-84 and 87.
[97] T39/177-178.
[98] T39/85-86.
[99] B2986-B2996.

33 raised a design query over the construction of the anchorage into the as-built OTE wall and D-wall, where the width of the OTE outside the eastern limit of the Eastern D-wall was less than 1200mm, due to the difficulty of fixing the L-shaped bars to the couplers on the D-wall.

44. Atkins responded to TQ 33 that reduced the distance from 1200mm to 1100mm and required that the topmost of 3 bars be bent upwards and "*the OTE wall must be concrete / pour together at the same time (monolithically) with the 3m EWL slab and the wall to extend to 300mm above the chamfer section of the wall to provide the kicker of the OTE wall above*".[100]

45. In providing the response to TQ 33, Atkins stated that Leighton should carry out the work "*monolithically*" or "*at the same time*". The term "*monolithically*" has been used to maintain a view that one would need to first trim down the D-wall otherwise one could not cast the OTE and EWL Slab "*monolithically*".[101] At no time did this TQ or the response refer to any trimming down or breaking of the D-wall.[102]

46. It was Atkins' designer Mr Lee who first used the words "*monolithically*" and "*at the same time*" in an email response to TQ 33 on 24 July 2015.[103]

47. TQ 33 related to a relatively simple design query affecting a small number of D-wall panels:

47.1 TQ 33 was concerned with working space to fix the L-shaped bars to the couplers in the OTE Slab and following the reply to TQ 33 (which the

[100] B2997-B2999.
[101] Mr Buckland [T23/113].
[102] The argument is for the structure to work monolithically then (by necessity) breaking down of the D-wall would be required.
[103] B7512-B7513.

distance reduced and enable the L-shaped bar to be fixed) it only applied to just 12 D-wall panels[104] with less than 1100mm working space and certainly not the whole of the Eastern D-wall.

47.2 When Atkins replied to TQ 33, it was not aware of any trimming down of the D-wall and its reply was based on the original design (i.e. with couplers).[105]

47.3 Of the (12) panels, (2) panels (EH40 and EH44) in the end did not use couplers and were constructed without using the alternative straight bar detail (the Second Change) based on the final as-built drawings.[106]

47.4 Of the (12) D-wall panels that were still affected, they were constructed part of slab pours B1, C3-4, C3-5 and C3-6 concreted on 15 December 2015, 30 November 2015, 24 October 2015 and 7 November 2015 respectively. This was some time after the reply to TQ 33.

47.5 The words "*monolithically*" and "*at the same time*" should sensibly be construed as a requirement that the OTE wall and the EWL Slab on each side of the D-wall would be cast at the same time to ensure full tension anchorage for the 3m EWL Slab.

48. The evidence which Atkins relies upon is as follows:

48.1 Drawings[107] which show only 12 panels affected by TQ 33 (highlighted in yellow).[108]

[104] EH40, EH42, EH43, EH44, EH109, EH110, EH111, EH111A, EH112, EH113, EH114 and EH115.
[105] At no time does TQ 33 refer to the trimming or breaking down of the D-wall.
[106] C26494-C26495.
[107] J3304-J3305.
[108] For information, as-built drawings issued by Leighton [C26494-C26495] for the Second Change show that EH40 and EH44 were constructed without using the alternative straight bar detail so they did not follow TQ 33.

48.2 At no time was Atkins aware that the D-wall was being trimmed down[109] and considered that the design principle of the EWL Slab and the OTE working monolithically using the existing couplers remained unchanged.

48.3 The term "*monolithically*" and "*at the same time*" was understood as there were no clarifications or queries were raised.[110] In Mr Lee's view, there was no point in issuing TQ 33 if it would be trimmed down in any event.[111]

48.4 Mr WC Lee stated at paragraph 23 of his witness statement that "*[b]y monolithically, I meant the OTE wall and the EWL slab on each side of the D-wall cast at the same time to ensure full tension anchorage for the 3m EWL slab*".[112] Mr Lee mentioned that the way it was achieved was by couplers.[113]

48.5 Mr Lee also clarified that the reference to "*monolithic*" in PNAP APP 68[114] was not applicable as it refers to cantilevered slabs exposed to weather.[115]

48.6 Dr Rob McCrae provided the context of these communications in his witness testimony. In response to Commissioner Hansford's question, Dr McCrae confirmed that "*monolithic*" is a reference to the structural behaviour of the finished structure as opposed to its being necessarily cast in one piece; although due to the time factor, Atkins wished both the EWL and OTE to be cast "*at the same time*", i.e. "*concurrently*".[116]

[109] Witness Statement of Mr Lee, para 39 [J4529].
[110] Mr Lee [T34/25].
[111] T34/38. See also Mr Lee [T34/10] and J6/4529.
[112] J4527.
[113] T34/31 and 32.
[114] C10768.
[115] T34/19-20 and 23.
[116] T36/153-155 and 162.

48.7 The drawings which accompanied PWD-059A3 include several typical details, the words "*concrete cast together at the same time*", to keep the D-wall intact with coupler embedded in the D-wall and there is no reference to the trimming down of the D-wall.[117]

Technical Query 34 ("TQ 34")

49. On 27 July 2015, Leighton raised TQ 34 to Team B.[118] It consisted of a simple remedial issue concerning the misalignment between rebar at EWL Slab and couplers at one panel (EH74) at the Eastern D-wall. The remedial proposal for this panel was to break out the D-wall to just below this bar and replace with a straight through bar with a coupler on the OTE side of the D-wall.

50. TQ 34 and in particular the approval of the Atkins design team to allow the breaking out of the top layer of reinforcement and using straight through bars has no connection to the Second Change.[119]

51. Atkins' position is that:

51.1 TQ 34 was raised in response to a construction defect on panel EH74 where the top layer of reinforcement had been misaligned.

51.2 It only referred to one wall panel (EH74).

51.3 The response to this TQ was of limited scope in that this affected one layer of reinforcement and a small amount of trimming of the D-wall to expose a single layer of reinforcement bars.

51.4 This TQ was not relevant to the Second Change.

[117] T34/47 and 56-57. See sections on drawing [B7428].
[118] B12527-B12528.
[119] Mr Buckland [T23/167], Mr Chan [T26/136] and Mr Ma [T27/118].

52. The evidence which Atkins relies upon is as follows:

52.1 TQ 34 clearly shows that it only affects (1) D-wall panel (EH74), including the subject which states "*EH74 - Misalignment Between Rebar At EWL Slab and Couplers at Diaphragm Wall*".[120]

52.2 TQ 34 only affects one layer of reinforcement which is indicated within a balloon on the sketch enclosed in TQ 34.[121]

52.3 The difference between the TQ 34 and the final as-built drawings are significant and can be found by straightforward comparison of the sketch[122] to the as-built drawings.[123] For example, the breaking out of the D-wall under TQ 34 was to a maximum of 200mm and related to just the top layer of reinforcement and whilst the breaking out under the Second Change varied from 200mm to 3000mm and included up to 3 layers of reinforcement. The change under TQ 34 still assumed a coupler on the OTE side of the D-wall and in the Second Change there are no couplers.

52.4 The Second Change appears to have proceeded without reference to TQ 34.[124]

Proposed finding

52.5 Atkins was not a party to nor contributed to any alleged miscommunication between the Construction Management Team and Design Management Team of MTRCL and/or Leighton which caused or contributed to any of the issues relevant to the Commission.

[120] B12527 and agreed to by Mr Chan [T26/133 and 135].
[121] B12528.
[122] B12528.
[123] B25487.
[124] Mr Huyghe [T39/88-89] where he said that "*the horse was out of the barn*".

PREPARATION OF AS-BUILT DRAWINGS AND OBTAINING BD APPROVAL

Atkins' role in obtaining the approval of BD in relation to the First Change

(a) Atkins' role in preparing as-built drawings for the D-wall and the First Change

53. The Commission has considered the development of the as-built drawings for the D-wall and the submission of the drawings to BD to obtain the BA14 Completion Certificate.

54. In late December 2014, Team B was requested by Leighton to assist in the preparation of D-wall as-built drawings.[125]

55. The D-wall as-built drawings were prepared by Intrafor (Hong Kong) Limited ("Intrafor"), Leighton's D-wall sub-contractor and these drawings were issued to Team B for checking to ensure that what was built complied with all Design Amendment Sheets ("DAmS") and approved changes.

56. As the as-built drawings for the D-wall were completed, Leighton issued them to MTRCL's Construction Team and via the MTRCL's Design Management Team they issued to Team A to review submissions and advise MTRCL to allow them to make submissions to BD.

57. The work was done in a series of batches which was prepared by Intrafor and the first batch was submitted to BD on 27 January 2015[126]

[125] Witness Statement of Mr Blackwood, para 30 [J63].
[126] C20980 - C21030.

and the final batch 22 January 2016.[127] These were accepted by BD on 5 May 2017.[128]

58. Throughout the development of the as-built drawings for the D-wall, Atkins was not on site[129] and therefore relied on the information provided by Leighton and Intrafor to prepare the as-built drawings.[130] Atkins' role was limited to reviewing the information received to ensure that what was built complied with any approved changes. Atkins did not and could not check the as-built drawings with what was actually built on site.

59. The as-built drawings for the D-wall (First Change) were submitted and approved by BD.

Proposed finding

60. Atkins supported in achieving retrospective acceptance of the First Change by BD.[131]

<u>Atkins' role in obtaining BD approval in relation to the Second Change</u>

(a) Atkins' role in the as-built drawings for the EWL Slab and the Second Change

61. The Commission has considered the development of the as-built drawings for the EWL Slab and the delay in the submission of the as-built drawings to the Commission for the EWL Slab associated with the Second Change.

[127] C21819 - C21820.
[128] H5125-H5157.
[129] Mr Blackwood [T33/68].
[130] This was accepted by Mr Buckland [T24/53].
[131] By the preparations of PWD-059A3. Witness Statement of Mr Blackwood, para 74 [J70].

62. Atkins was not aware of the trimming down of the D-wall and the use of through bars rather than couplers (i.e. the Second Change) at the time of the construction on site.[132]

63. Atkins only became aware of the Second Change when it was instructed to prepare the as-built for the Station Box, which included the EWL Slab and the connection to the D-wall after 12 June 2018.[133]

64. Atkins had no presence on site overseeing or monitoring construction and relied upon information provided by Leighton to produce the as-built drawings in order to develop the as-built drawings.[134]

65. Atkins' Team B was still working on the as-built drawings at the start of the Commission hearing. On 19 September 2018, the as-built drawings were submitted by Leighton to MTRCL's Construction Team to confirm that the drawings were a true record of what was constructed.[135] Team A received a copy of these amendment drawings from MTRCL via email on 21 September 2018.

66. These amendment drawings have been used by the Commission to identify the as-built condition.[136]

Proposed finding

67. Atkins has supported in the preparation of as-built drawings for the Second Change since being requested to do so after June 2018.

[132] Dr McCrae [T36/159].
[133] Mr Blackwood [T33/78].
[134] Mr Blackwood [T33/85] and Witness Statement of Mr Blackwood, para 14 [J59].
[135] C26491-C26493.
[136] C26494-C26495.

(b) Atkins' role in the BD process in relation to the Second Change

68. Atkins was asked to explain its role in the procedures for seeking approval from the BD.[137]

69. Atkins' Team A had a responsibility for reviewing and preparing submissions for submission to BD on behalf of MTRCL; and Atkins' Team B was responsible for supporting Leighton in preparing submissions on temporary works and for certain changes to permanent works as part of its services.

70. The procedure was that Team B prepared submissions required by Leighton for the temporary works and any proposed changes to permanent works. These were passed to Leighton who submitted them to MTRCL's Construction Management Team and who then in turn passed them to MTRCL's Design Management Team who finally liaised with Team A for their formal review. [138]

71. Team A reviewed both the permanent and temporary works submissions and were responsible for preparing submissions for issue to BD on MTRCL's behalf. The process was and is regarded as very important and is set out in the Witness Statement of Mr Blackwood at paragraph 26 and agreed to in the witness testimony of Mr Leung[139] and Mr Buckland.[140]

72. Under Contract C1106 and Contract 1112, Atkins had no responsibility for submissions to BD for the Station Box. Any BD submission would

[137] J5.
[138] Witness Statement of Mr Blackwood, para 26 [J62-63].
[139] T25/111-112.
[140] T24/43-57.

be the responsibility of MTRCL and the Competent Person ("CP") to BD for acceptance.[141]

Proposed finding

73. Atkins was not involved in any decisions in relation to BD issues in relation to the Second Change.

Should the parties have taken steps to seek approval from the BD in relation to the Second Change?

74. It has been suggested that the Second Change required that an application should be made for BD approval.

75. Atkins makes the following observations:

75.1 It appears that the Second Change involved a substitution of couplers for straight through reinforcement bars. This would not change the behaviour of the joint connection between D-wall and slab[142] and therefore it is likely that it would not change the design intent.[143]

75.2 It is common practice to use couplers instead of reinforcement bars and vice versa.[144]

[141] Witness Statement of Mr Blackwood, paras 35 and 100 [J64 and J75]; Witness Statement of Dr McCrae, para 4 [J3344-3345]; Witness Statement of Mr Lee, para 33 [J4528] and Witness Statement of Mr Sung, paras 27-28 [J4539].
[142] Witness Statement of Mr Sung, para 26 [J4539].
[143] Witness Statement of Mr Blackwood, para 98 [J75]; Witness Statement of Mr Lee, para 35 [J4528]; Witness Statement of Mr Sung, para 30 [J4539]; and Witness Statement of Mr Chan, para 27 [J4506].
[144] Witness Statement of Mr Blackwood, para 98 [J75].

75.3 It will not consist of a substantial change if it does not change the design intent[145] and if the structural stability was not affected.[146]

75.4 Mr Blackwood stated that "*it's not a major change*", however, the scale may be quite significant because of the extent on the Project and one would discuss with the MTRCL Design Management Team and consult with the CP whether a submission would be made to BD[147]

75.5 This would normally be regarded as a minor amendment which for a non-Instrument of Exemption ("IoE") project[148] would normally be submitted to BD for approval and consent.[149]

75.6 As the Project was subject to an IoE, provided that the structural stability was not affected, consent may not be required though it would be normal to consult with BD as to the change. However, whether or not this was required is at the discretion of the CP.[150]

75.7 Also, if the change needed to be submitted to BD, this would be a decision for the CP to make.[151]

Proposed finding

76. The Second Change was not substantial in nature provided that the structural integrity is not affected and may not have required a submission for consent by BD in advance of construction.

---

[145] Witness Statement of Mr Blackwood, para 98 [J75]; Witness Statement of Mr Lee, para 30 [J4528]; Witness Statement of Dr McCrae, para 68 [J3354]; and Witness Statement of Mr Chan, para 23 [J4505].
[146] Witness Statement of Mr Sung, para 26 [J4539]. Witness Statement of Mr Blackwood, paras 52-53 [J67]. Also see Witness Statement of Mr WC Lee at para 18 who states you should also consider the "*where there are openings in the slab (such as opening for the vertical access), the sensitivity of the design of the cutting and existence of gaps…*".
[147] T33/81-82.
[148] This would be a "typical" BD project.
[149] Witness Statement of Mr Sung, para 26 [J4539].
[150] Witness Statement of Mr Sung, para 26 [J4539].
[151] Witness Statement of Mr Blackwood, para 98 [J75]; Witness Statement of Mr Lee, para 33 [J4528]; and Witness Statement of Mr Chan, para 24 [J4505].

THE PERMANENT WORKS DESIGN

Observations on the shear stress calculations submitted by Atkins

77. Atkins was requested by the Commission on 19 December 2018 to provide shear stress calculations for the First Change and the Second Change.[152] The Commission did not require Atkins to provide internal stress calculations for all possible construction joint alternatives based on the as-built drawings conditions. Atkins responded on 31 December 2018 to the request made late on 19 December 2018 ("Initial Calculations").[153]

78. In his report, structural expert Professor TK Au suggested that the Initial Calculations are not correct.[154] It was also suggested that further calculations of further areas of potential stress for the construction joins are required.[155]

79. Professor Au was asked about the appropriateness of his criticism and his requirement for additional calculations. He remained of the view that a limited series of further "*simple*" calculations were required on the Commission's request, a list of these was produced on 17 January 2019.[156]

80. The list was submitted under a covering letter from the DOJ which attached also a large number of calculations produced by a consultant called Mannings ("Mannings Calculations"). It is understood from recent comments to the Commission made by Counsel for the Government that the Mannings Calculations are not relied upon.

---

[152] J4555.
[153] Submitted on 31 December 2018 [J4556-J4567].
[154] T40/79-80 and Expert Report of Professor Au, para 6.4.3.3 [ER1, Tab 7, 11].
[155] See Expert Report of Professor Au, para 6.4.3.4 [ER1, Tab 7, 12].
[156] H45876.

81. The Initial Calculations have been commented upon by other structural expert witnesses Mr Nick Southward and Dr Mike Glover in their respective PowerPoint presentations.[157] It was also commented upon by Professor Don McQuillan in his Expert Report.[158] The calculations of Arup and COWI have been relied upon by those experts and considered to corroborate Atkins' calculations as to the structural integrity, safety and robustness of the design.

82. Atkins position is as follows:

82.1 The conclusion of the Initial Calculations is supported by paragraph 3 of the Agreed Expert Memorandum, where all structural experts (including Professor Au) agreed that "*the change from couplers to through bars [was] subject to a review of the internal stresses … the outcome would not show the construction joint to be problematic*".[159]

82.2 In addition, it was noted by Professor McQuillan that the effect of the Second Change and the integral block of reinforced concrete above the D-wall means that the wall construction joints are in compression and any shear force that developed will be resisted by the "*clamping action*" of the EWL and OTE slabs which bear against the D-wall.[160]

82.3 Against that background:

82.3.1 In the witness testimony of Professor McQuillan, he stated that "*this call for [additional shear] calculations is therefore both pedantic and unnecessary*" and would be "*a complete overkill and a total waste of resource*";[161]

[157] ER1, Tab 5.1 and Tab 6.1.
[158] Agreed to by Professor McQuillan, para 100 [ER1, Tab 3.0, 42].
[159] ER1, Tab 3.0, 118.
[160] Expert Report of Professor McQuillan, paras 99-100 [ER1, Tab 3.0, 41-42].
[161] T44/121-122. This is in relation to a call for such calculations by Professor Au.

82.3.2 In the witness testimony of Mr Southward, he disagreed with Professor Au's criticisms of the Initial Calculations and said that "*it is a very conservative approach because there can't be any more shear force*".[162] When asked whether a finite element analysis was necessary, he said "*[n]ot really, no*";[163] and

82.3.3 In the witness testimony of Professor McQuillan, he stated that he relied upon "*the recently issued COWI report, which corroborates the findings of Arup, who in turn have corroborated the work of Atkins*", all of which he regards as corroborative of the engineering assessments underlying his conclusions.[164]

82.4 Notwithstanding those views, the Commission's interest in these limited additional calculations is noted and respected; and therefore, it is recognised that the Commission may direct for these further calculations to be carried out and like Dr Glover,[165] Atkins is content that if the Commission regards these as desirable to close the issue, then it is supportive of so proceeding.

Proposed finding

83. A difference of views exists as to the approach to be taken to the assessment of internal stresses at the construction joints, but the Commission has identified that the difference may be best addressed by procuring some limited additional calculations.

[162] T43/3-4.
[163] T43/13-14.
[164] T44/95.
[165] T43/163-165.

Observations on approach to the design of the EWL Slab and NSL Slab

84. Dr Glover included in his report some observations that the original design certain of the reinforcement was, in his view, too conservative.[166]

85. Atkins position is that its design is appropriate for the following reasons:

85.1 The nature of the Project in that the Station Box was constructed below an important and operational existing building[167] with stringent tolerances for movement and safety.

85.2 The programme for the Project meant that the design had to be flexible enough to accommodate the contractors working methods and temporary condition (including top-down construction).[168]

85.3 The ELS Slab design was complex in that it need to accommodate the numerous holes and openings in the slab that were required for lifts, escalators and ducting for the station.

85.4 Whilst the compliance with the Codes is not mandatory, the pressure to get designs approved by "*people who have authority but no real responsibility*"[169] results in a strict adherence to Codes meaning that, by necessity, designs in Hong Kong are conservative in order to be Code compliant.

86. The evidence which Atkins relies upon is as follows:

86.1 Dr Glover's reflection on his observations, who explained that his comments were "*not an assault of any particular individual or firm*".[170]

[166] There was an unquestioning application of the Code of Practice for Structural Use of Concrete 2004 (Second Edition) which was for guidance only. See Expert Report of Dr Glover, paras 5.1, 5.2, 5.5-5.7, 5.9 and 6.8 [ER-1, Tab 6, 5-8].
[167] The Hong Kong Coliseum.
[168] This was accepted by Dr Glover [T43/173].
[169] T43/177.
[170] T43/170.

Dr Glover agreed with the Chairman that "*his comments and observations ... are to be looked at in the context [which may constrain people like Atkins in the design of this kind (in Hong Kong)]*".[171]

86.2 Dr Glover stated that "*if you had a more benevolent approval system* (in Hong Kong)*, then I think you would have ended up with a better design, less conservative, more considered. But within the context of the limitations you had, I can fully understand what you've done*".[172]

86.3 The witness testimony of Professor Au where when asked if the Code of Practice for Structural Use of Concrete 2004 was mandatory, he agreed that it was not a statutory requirement, however as the design is required to be accepted by BD it was (in effect) mandatory.[173]

86.4 The witness testimony of Dr Glover who said that the codes "*might be guidelines but reality is they are mandatory*" and you learn that very quickly, hence the word "*unquestioning*" because the process would not be able to deliver the design otherwise.[174]

86.5 Dr Glover considered that by reference to the codes in Hong Kong, that "*the way the rules are written, you don't have an option as a designer*" but to comply.[175]

Proposed finding

87. The design of the permanent works was carried out in an appropriate manner in accordance with the relevant standards and the approval process in Hong Kong.

[171] T44/7-8.
[172] T43/183-184.
[173] T40/195-197.
[174] T43/170.
[175] T43/172.

Observations on safety and integrity of the design

88. Dr Glover accepted in his witness testimony that he was comfortable with the level of redundancy and the structure was "*absolutely*" fundamentally safe.[176]

89. The design of the structure is robust. There is no reasonable question as to the integrity of the structure. It is safe.

90. Mr Southward observed in his report, at Section 2, that the structural redundancy in the Station Box structure is such that there is no concern for the overall structural safety and integrity of the structure.[177]

91. This view is supported by Dr Glover in his report, at paragraph 8.10: "*the structure has large degrees of redundancy and robustness and, consequently, a comfortable margin of safety which supports my opinion that the structure is safe for its intended lifespan*".[178]

92. Professor McQuillan agreed with these views and confirmed, at paragraph 126, that "*there are no safety issues or concerns*".[179]

Proposed finding

93. The structure is safe.

[176] T44/4.
[177] ER1, Tab 5, 6.
[178] ER1, Tab 6, 13.
[179] ER1, Tab 3, 49.

KNOWLEDGE OF REBAR CUTTING AND DEFECTIVE COUPLER CONNECTIONS

Atkins' knowledge of the cutting of threaded steel reinforcement bars and the defective coupler connections

94. Based on information put before the Commission[180] and as well as daily reports of the opening up works[181] there appears to be some evidence of cutting of steel bars and/or defective coupler installation.

95. Atkins' position is that:

95.1 Atkins had no presence on site and therefore had no knowledge of whether reinforcement was being cut or if couplers were being installed incorrectly.[182]

95.2 Atkins was not required to be on site according to their respective contracts with MTRCL and Leighton nor to carry out any site supervision.

95.3 Atkins was not copied in on any incident reports on site at the time including NRC 157 and they had no knowledge of this incident. [183]

Proposed finding

96. Atkins had no knowledge of any cutting of steel bars nor defective coupler installation for D-walls to slab and slab to slab during construction period on site.

[180] For example, a non conformance report (NCR) was issued by later (NCR157) [B7/4612] in December 2015 in respect of threaded rebar cutting and 5 occurrences of trimming down the threaded ends of the Rebar between the period of August to end of December 2015
[181] Bundle OU1.
[182] Witness Statement of Mr Blackwood, para 39 [J65], agreed by Mr Buckland [T24/50].
[183] NCR 157 [B4612] where Atkins is not on the copy list; Witness Statement of Mr Blackwood, paras 39-40 [J65] and Witness Statement of Mr Lee, para 7 [J4524].

OBSERVATIONS FOR FUTURE PROJECTS

97. In light of the evidence heard on those aspects of the Terms of Reference in which Atkins has had involvement, the following observations for future projects are offered to the Commission:

97.1 In future complex infrastructure projects in Hong Kong in which a design consultant is engaged, communications among all relevant stakeholders may be enhanced by making provision in the appointment(s) of the consultant for an allowance of a meaningful site presence; and

97.2 In future complex infrastructure projects in Hong Kong in which the same design consultant is to be engaged by both the project owner and the contractor, consideration should be had to the development by the project owner of a conflict of interest policy and the establishment of a conflict of interest committee comprising of all relevant stakeholders, to monitor compliance with said policy.

SUMMARY OF PROPOSED FINDINGS

98. In conclusion, based on the evidence presented to the Commission, Atkins invites the Commission to find that:

99. There was no actual or perceived conflict of interest in the services carried out by Atkins under both Contract C1106 and Contract 1112; and there is no connection between the dual appointment and any of the matters concerning the Commission under the Terms of Reference.

100. The small overlap between Team A and Team B did not cause or contribute to any of the matters being considered by the Commission under its Terms of Reference.

101. It was not Atkins' obligation to obtain approval from MTRCL to the extension of Atkins Team B's scope; but in any event, the extension did not require formal approval from the Engineer. Insofar as approval was required, it was provided informally by those to whom the Engineer had delegated authority. Finally, the manner of the extension of scope did not cause or contribute to any of the matters being considered by the Commission.

102. The as-built drawings for the D-wall identified the need for an amendment submission to BD. Atkins supported in achieving retrospective acceptance by BD of the First Change and the issue of updated working drawings to reflect it.

103. Atkins was not involved in the Second Change and had no knowledge of until after June 2018.

104. Atkins was not a party to nor contributed to any alleged miscommunication between the Construction Management Team and

Design Management Team of MTRCL and/or Leighton which caused or contributed to any of the issues relevant to the Commission.

105. Atkins supported in achieving retrospective acceptance of the First Change by BD.

106. Atkins has supported in the preparation of as-built drawings for the Second Change since being requested to do so after June 2018.

107. Atkins was not involved in any decisions in relation to BD issues in relation to the Second Change.

108. The Second Change was not substantial in nature provided that the structural integrity is not affected and may not have required a submission for consent by BD in advance of construction.

109. A difference of views exists as to the approach to be taken to the assessment of internal stresses at the construction joints, but the Commission has identified that the difference may be best addressed by procuring some limited additional calculations.

110. The design of the permanent works was carried out in an appropriate manner in accordance with the relevant standards and the approval process in Hong Kong.

111. The structure is safe.

112. Atkins had no knowledge of any cutting of steel bars nor defective coupler installation for D-walls to slab and slab to slab during construction period on site.

113. Observations for future complex infrastructure projects in Hong Kong are:

113.1 Consideration of allowance of an on site presence for the design consultant; and

113.2 Consideration of development of a conflict of interest policy and a conflict of interest committee.

CLOSE

114. Atkins trusts that these Closing Submissions assist the Commission in its consideration of the evidence and in reaching its findings on the matters raised in the Terms of Reference.

Vincent Connor

Pinsent Masons

Solicitor Advocate for Atkins China Limited