

**Commission of Inquiry into the Construction Works at and near the Hung Hom Station
Extension under the Shatin to Central Link Project**

FIRST WITNESS STATEMENT OF ALAN YEUNG

I, Alan Yeung of 39/F Sun Hung Kai Centre, 30 Harbour Road, Hong Kong, say as follows:

1. I was, at the times relevant to this statement, a senior engineer employed by Leighton Contractors (Asia) Limited (“**Leighton**”), the main contractor for the Hung Hom Station Extension contract (Contract SCL 1112) (the “**Project**”) under the Shatin-Central rail link project. The client for the Project is MTR Corporation Limited (“**MTRCL**”).
2. Unless otherwise stated, the facts stated herein are within my personal knowledge and are true. Where the facts and matters stated herein are not within my own knowledge, they are based on the stated sources and are true to the best of my knowledge, information and belief.

My qualification and experience

3. I hold a degree in civil engineering. Prior to joining the Project, I had five years professional work experience as an engineer. I understand that I qualify as TCP T3 for the purposes of supervision on the Project.
4. I was employed by Leighton in 2014 as a senior engineer, and was part of the construction team on the Project. The construction team is responsible for (among other things) method statement, procurement, management of resources, coordination, supervision and inspection of the works, sequencing of the works and worker safety.
5. From September 2014 to January 2016, I worked on Stable Sidings area (“**HHS**”). From January 2016 to January 2017, I worked on the South Approach Tunnel area (“**SAT**”) at the North South Line (“**NSL**”) level (i.e. the “**SAT NSL area**”).

My role and responsibilities

Working hours

6. My usual working hours on the Project were from 8am to 6pm. I also worked over time on days when construction works continued into the evening in the areas that I was responsible for on the Project.

Duties and responsibilities

7. One of my main duties on the Project was to supervise the subcontractors and conduct both routine and formal inspections of the reinforcement and the formwork that was erected prior to concreting. For the HHS, the subcontractor responsible for rebar fixing was Wing & Kwong Steel Engineering Co Ltd ("**Wing & Kwong**"), and the subcontractor responsible for concreting works (including erecting formwork and falsework and cleaning the area before the pouring of concrete) was Bik Hoi Civil Engineering Company Ltd ("**Bik Hoi**"). For the SAT NSL area, the subcontractor responsible for rebar fixing was Fang Sheung Construction Company Ltd ("**Fang Sheung**"), and the subcontractor responsible for concreting works was China Technology Corporation Limited.
8. I was generally responsible for supervising the work of the subcontractors in my areas, including the rebar fixing and concreting works. An important part of this was conducting formal inspections for rebar fixing and pre-pour checks with MTRCL's engineer/Inspector of Works ("**IoW**") at each "hold point" under the Inspection Test Plans ("**ITP**"). I discuss this in greater detail below.
9. On the HHS, I worked in a team of engineers which was managed by a site agent and included a sub-agent and another engineer at or around my level. At the SAT NSL area, I worked in a team of engineers which was supervised by a site agent and included other engineers at or around my level.

Daily routine on the Project

10. I would start my day in the site office. I would then normally go down to the construction site and do the first of my "rounds". I would typically spend 2 hours on site in the morning. I would then return to the site office at or around lunch time. After

lunch, I would return to the construction site for another “round”. I would typically spend 2 to 3 hours at the construction site in the afternoon. If I worked over time, I would also visit the site again in the evening. I estimate that I usually spent around 4 to 6 hours on site each day.

11. During my rounds, I conducted routine inspections in order to check that the work was being carried out in accordance with the company’s safety standards, approved or agreed drawings, the required workflow process and the ITP. I also ensured that the subcontractors were aware of the work schedule and would be able to meet target completion dates.

Supervision and inspection

12. There were various levels of supervision and inspection conducted on the works in my areas of the Project. This included routine inspections (as mentioned above) and formal inspections which were jointly conducted by Leighton and MTRCL at “hold points”.
13. I set out below a description of my routine inspections and the formal inspection process.

Routine and informal inspections

14. I would often undertake informal inspections together with MTRCL’s engineers / IoWs. This would happen if we met each other on site or arranged to look at the works before the formal inspections.
15. In these informal inspections (which were very similar to the formal inspections noted below, but were not documented), we would check coupler connections, the arrangement of the rebar, the condition of the formwork and falsework and other miscellaneous items. When checking the connections between rebar and couplers, I looked to ensure that every rebar was fully screwed in or only a few threads were showing out of the coupler. In my experience, it was impossible for the subcontractor to fully screw every rebar into the couplers. Sometimes, despite the best efforts of the sub-contractor’s workers, a few threads could not be screwed into the coupler.

Formal inspections

16. The formalities associated with the formal inspections were as follows:

- (a) There were two key formal inspections of the reinforcement. The first was the rebar fixing inspection with MTRCL's engineer. The second was the pre-pour check with MTRCL's IoW;
- (b) The subcontractors knew that their work would need to be formally inspected (if there were any defects, the subcontractors also knew that they would have to be rectified) before they could proceed to the next phase. These formal inspections of the subcontractors work happened at "hold points". These "hold points" were a critical stage in the construction process. They were set out in the ITP and included in the Method Statements. Once a "hold point" was reached, work could only continue after a formal inspection was conducted by Leighton and MTRCL and only if both parties gave their approval;
- (c) Before or around the time of a formal inspection, Leighton's engineer would issue a Request for Inspection and Survey Check ("RISC") form to MTRCL and would let MTRCL's engineer/IoW know the likely time of the inspection;
- (d) MTRCL's engineer and Leighton's engineer would jointly conduct the formal inspection for rebar fixing (which I discuss further below);
- (e) After MTRCL's engineer and Leighton's engineer had jointly conducted the formal inspection for rebar fixing (and if the works were satisfactory), MTRCL's engineer would verbally approve the rebar fixing inspection. Generally, the practice was to arrange the rebar fixing work and the preparation work for the concreting simultaneously. This reduced delays and allowed the formal inspections to happen shortly after each other;
- (f) Once the preparation work for the concreting was completed, MTRCL and Leighton would jointly conduct the formal inspection for the pre-pour check. This formal inspection was usually conducted by MTRCL's IoW;
- (g) It was standard practice for MTRCL's engineer/IoW to verbally approve the inspected works and authorise Leighton to proceed immediately after the formal inspections. The only exception would be if MTRCL required rectifications of

any defects. If the defect was minor, Leighton would ensure that such remedial work was completed immediately by the subcontractor during the inspection. Otherwise, if more time was required to complete the work, Leighton's staff would check the completed work before arranging a further inspection with MTRCL. MTRCL's engineer/IoW would subsequently inspect the completed work and give their verbal approval; and

- (h) It was standard practice for work to proceed after verbal approval was obtained from MTRCL following a formal inspection. This allowed work to continue without delay. Thereafter, MTRCL's engineer/IoW would complete the RISC form to record their approval and return it to Leighton later.

17. The practical aspects of the formal inspection for rebar fixing were as follows:

- (a) There were in fact two formal inspections of the rebar fixing works. The first was undertaken after the subcontractor had installed the bottom layer of rebar and, the second inspection was conducted after the installation of the top layer of rebar;
- (b) Each of the two inspections of rebar fixing involved checking the arrangement of rebar, the spacing of the bars, lap length of the bars and the connections between the bars and couplers. The following steps would be taken:
 - i. physically measure the spacing and lap length of the rebar samples in the area to be inspected and checking whether the as-built works complied with the working or agreed drawings; and
 - ii. with reference to the measured samples, conducting visual checks across the area to ensure that the the spacing and lapping of the rebar was consistent; and
 - iii. checking that the threads of the rebar were screwed into the couplers and not exposed (or that only a few threads were exposed at most); and
- (c) Each of the two inspections for rebar fixing were conducted jointly by MTRCL's engineer and Leighton's engineer.

RISC Forms

18. I was one of the engineers who was responsible for the formal inspections for rebar fixing and pre-pour checks at the SAT NSL and HHS area.
19. I would submit RISC forms for each formal inspection. There were times when RISC forms were issued and submitted immediately following a formal inspection or in the days thereafter. As noted, it was standard practice for Leighton to continue working once it obtained the MTRCL's verbal approval after a formal inspection. This allowed work to continue without delay. MTRCL's staff was aware, and approved, of this standard practice.
20. Leighton has prepared and disclosed a table summarising the records of the formal inspections for rebar fixing and pre-pour checks for the SAT (numbered **LCAL.SAT.2.01** in the Index). I have not confirmed or checked the accuracy of the table. However, according to this table, it shows that I submitted most of the RISC forms for the formal inspections that I was responsible for in the SAT NSL area, with the exception that I did not submit forms for 5 out of the 44 relevant formal inspections in that area. The details are as follows:
 - (a) I did not submit a RISC form for 4 out of the 22 rebar fixing inspections for the SAT NSL area. However, I completed the RISC forms for the pre-pour checks for those 4 concrete pours; and
 - (b) I did not submit a RISC form for 1 out of 22 pre-pour check inspections for the SAT NSL area. However, I completed the RISC form for the rebar fixing inspection for that concrete pour.
21. Leighton has prepared and disclosed a table summarising the records of the formal inspections for rebar fixing and pre-pour checks for the HHS (numbered **LCAL.HHS.2.01** in the Index). I have not confirmed or checked the accuracy of the table. However, according to this table, it shows that I submitted most of the RISC forms for the formal inspections that I was responsible for in the HHS, with the exception that I did not submit forms for 28 out of the 62 relevant formal inspections in that area. The details are as follows:
 - (a) I did not submit a RISC form for 14 out of the 37 rebar fixing inspections; and

- (b) I did not submit a RISC form for 14 out of 25 pre-pour check inspections. However, I completed the RISC form for the rebar fixing inspections for 6 of those concrete pours.
22. I tried my best to submit RISC forms for all formal inspections but I must have forgotten to submit the ones that are outstanding. I was constantly busy supervising the works, completing inspections and attending to other necessary tasks. For this reason, I did not have time to review all of the RISC forms that I had issued in order to consider if I had missed any of them.
23. For those formal inspections where I did not issue a RISC form, I confirm that:
- (a) MTRCL's engineer (for rebar fixing inspections) or IoW (for pre-pour check inspections) was contacted at or shortly before each "hold point" and requested to attend a formal inspection;
 - (b) MTRCL's engineer/IoW conducted the formal inspection (as described above) jointly with Leighton;
 - (c) Verbal approval from the MTRCL's engineer/IoW was always obtained before work was allowed to proceed or concrete was allowed to be poured. The only exception was if the MTRCL's engineer/IoW required any rectifications. Wherever possible, the remedial work was completed immediately by the subcontractor during the inspection. Otherwise, if more time was required to complete the rectification work, a further inspection would be arranged with the MTRCL. In those cases, the MTRCL's engineer/IoW subsequently inspected the rectification work and gave their verbal approval; and
 - (d) It was agreed and understood with the MTRCL's engineer/IoW that the lack of a RISC form should not hold up the progress of the works.
24. This is consistent with the MTRCL's site diary entries, which record the rebar fixing works, preparation work for the pouring of concrete and the concrete pour. It is also supported by the concrete cube test results for the concrete pours. The concrete test results prove the date of the concrete pour and confirm that MTRCL knew that the pour was happening at that time. These site diary records and concrete test results have been

disclosed to the Commission (at numbers **LCAL.SAT.2.02** (for the SAT NSL area) and **LCAL. HHS.2.02** (for the HHS) in the Index). Generally, the formal inspection for rebar fixing occurred on or shortly after the day when the rebar fixing was completed and the formal inspection for the pre-pour check occurred either the day before or on day when concrete was poured.

25. I also generated requests for a TW4 (permit to load) form to the extent that they were required for the formwork before the pouring of concrete in the SAT NSL area and the HHS. The TW4 form would be signed and issued by the Temporary Works Coordinator after they had inspected and approved the formwork. I would then provide a photocopy of the issued TW4 form to the MTRCL's IoW to confirm that the formwork had been approved. A copy of these TW4 forms have been disclosed to the Commission (at numbers **LCAL.SAT.2.02** (for the SAT NSL area) and **LCAL. HHS.2.02** (for the HHS) in the Index).
26. For the areas that I was responsible for in the SAT and HHS, I can therefore confirm that:
 - (a) all formal inspections for rebar fixing and pre-pour checks were carried out and approved by the MTRCL; and
 - (b) no concrete was poured unless MTRCL authorised Leighton to proceed with the concrete pour.

Testing of rebar

27. For the areas that I was responsible for in the SAT and HHS, I ordered the necessary rebar and arranged for the testing of the rebar. The practical aspects of the rebar testing were as follows:
 - (a) I would order a batch of rebar and inform the MTRCL's IoW when the batch was delivered to site;
 - (b) The MTRCL's IoW would select samples from the batch to be cut and labelled for testing;
 - (c) Thereafter, the MTRCL's IoW would inspect the samples again to ensure that they were accurately labelled and everything was in order;

- (d) The samples were then sent to the MTRCL's lab for testing. Leighton's Quality Assurance team handled this part of the process; and
 - (e) Leighton's Quality Assurance team would inform me of the test results in due course.
28. I was diligent in arranging for the testing of rebar that I ordered for the HHS and SAT NSL area. I have been informed that I forgot to test two batches of rebar of five different lengths for the SAT NSL area. If I did forget to test any batches of rebar, it was only because I was very busy while working on the SAT NSL area and must have forgotten to arrange the tests. Due to my workload on the Project, I did not have time to review all of the test results for the batches of rebar that I ordered in order to confirm that I had arranged tests for every batch of rebar.
29. With the possible exception of the two batches noted above, I confirm that all batches of rebar that I ordered were tested and passed all of the tests. In addition, all batches of rebar that I ordered passed the tests conducted by the manufacturer and came to the site with a certificate confirming that they were satisfactory. I therefore believe that all of the rebar that I ordered for the Project was acceptable and met the relevant requirements.

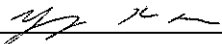
Use of couplers on the Project

30. At some locations in the Project, it was necessary to connect some rebar by using couplers (instead of lapping to connect bars) at some of the construction joints. Couplers were used at these locations because it would not have been suitable to use lapping to connect the rebar. In particular, couplers were used at the construction joints along access routes. It was critical that people and vehicles could move down these access routes (for example, to allow for the delivery of materials). This would not have been possible if continuous lapped bars had been installed across those routes.
31. MTRCL's staff was well aware of, and agreed with, the use of couplers instead of continuous lapped bars at the construction joints. The MTRCL's engineers/IOWs were on site for many hours each day and would have seen the couplers being installed. They would also have inspected these couplers during the formal inspections for rebar fixing and pre-pour checks at the construction joints.

The works are safe

32. In the areas that I was responsible for on the Project (which is all that I can comment on), I am satisfied with Leighton's and my supervision of the Project. We implemented a thorough system of supervision and inspection to ensure that the procedures were followed.
33. In my personal opinion, I believe that the works that I supervised are safe and properly constructed.

Dated the 17 day of May 2019.

Signed:  _____

Alan Yeung