

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

WITNESS STATEMENT OF RAYMOND TSOI

I, **RAYMOND TSOI** of 39/F Sun Hung Kai Centre, 30 Harbour Road, Hong Kong, will say as follows:

1. I was, at the times relevant to this statement, an 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 project manager 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. After I graduated from the University of Hong Kong with a Bachelor of Engineering degree in Civil Engineering, I was employed by Leighton in 2013 as a Graduate Engineer, and was part of the construction engineering team of the Project. The construction engineering team is responsible for, amongst other things, method statement, programming, procurement, management of resources, co-ordination, supervision and inspection of the works, sequencing of the works and worker safety. I was promoted to Engineer in April 2017 and then to Senior Engineer in April 2018. I was not on the Project from October 2015 to September 2016, when I was seconded to SMEC, an engineering consultant.
4. From November 2016 to March 2017, East West Line (“**EWL**”) level of the area of the South Approach Tunnels (“**SAT**”) (the “**SAT EWL Area**”) was one of my responsible areas. I understand that I am qualified to be a Technically Competent Person (TCP) of grade T3 for the Project in 2015 and I have been listed as TCP T3 since 2018.

My role and responsibilities

Working hours

5. My usual working hours on the Project were from 8am to 6pm. However, I often worked overtime until 9pm/10pm to deal with different categories of paperwork after spending my time on site during the day.

Duties and responsibilities

6. One of my main duties was to co-ordinate with and supervise the subcontractors and conduct both routine and formal joint inspections with MTRCL of the reinforcement and the preparation work for the pouring of concrete, including the formwork when it was required prior to concreting. For the SAT EWL Area, Fang Sheung Construction Company was the subcontractor for the fixing of reinforcement bars (“rebar”), and China Technology Construction Limited was the subcontractor for concreting works (including formwork and falsework erection and general cleaning of the area prior to concreting) after the fixing of rebar.
7. I was generally responsible for supervising the work of the subcontractors in my area, including rebar fixing and other preparation work for concrete pours. This included conducting a formal joint inspection with the MTRCL’s construction engineers / Inspectors of Works at each “hold point” under the Inspection Test Plans (“ITP”). I discuss this in greater detail below.
8. In the SAT, I worked with the engineers at or around my level in Leighton’s construction engineering team, which was managed by a site agent and construction managers.

Daily routine

9. On a typical day, I would start in the site office. I would then go on site to look at the various construction works, including conducting routine inspections. I would spend around 3 hours in the morning on site, return to the site office during lunch, and spend another 3 hours or so in the afternoon on site. I would then return to the site office and spend around 4 to 5 hours until the evening to handle various paperwork, e.g. programming, method statements, submissions, Requests For Information (RFIs),

Request for Inspection and Survey Check (“RISC”) forms and daily records. I estimate that I spent around 6 hours on site on average each day and a further 5 to 6 hours in the site office.

10. During the routine inspections, I would check whether the work was being carried out in accordance with Leighton’s safety standards, approved/agreed drawings, the required workflow process and the ITP. I would also check on the progress and manpower for the works to ensure that the subcontractors were aware of the work schedule and would be able to meet target completion dates. If there were any issues, I would raise them with the foremen of Leighton and of the subcontractors. They would also let me know if there were any matters which required my attention.

Supervision and inspection

11. 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 joint inspections which were conducted by Leighton and MTRCL at “hold points”.
12. I set out below a description of my routine inspections and the formal joint inspection process.

Routine and informal inspections

13. I would undertake routine informal inspections. These would be done by myself alone or together with the MTRCL’s construction engineers / Inspectors of Works if we met each other on site or arranged to look at the works before the formal inspections.
14. In these informal inspections, I/we would have a quick check on the condition of reinforcement including size, spacing, arrangement and other specific detail, condition of the formwork and falsework and other miscellaneous items prior to concreting.

Formal joint inspections

15. The formalities associated with the formal joint inspections were as follows:
 - (a) There were two key formal joint inspections prior to concreting. The first was the rebar fixing inspection with the MTRCL’s construction engineer. The second was the pre-pour check with the MTRCL’s Inspector of Works;

- (b) The subcontractors knew that their work would need to be inspected or rectified (if there were any defects) before they could proceed to the next phase. This was called a “hold point”. The “hold points” were a critical stage in the construction process. They were set out in the ITPs and included in the Method Statements. Once a “hold point” was reached, subsequent work could only commence after a formal joint inspection was conducted by Leighton and MTRCL and only if both parties gave their approval;
- (c) Prior to or around the time of a formal joint inspection, Leighton’s engineer would notify MTRCL (by issuing a RISC form and contacting MTRCL’s construction engineer / Inspector of Works);
- (d) MTRCL’s construction engineer (or MTRCL’s Inspector of Works delegated by and, as I understand, reported to MTRCL’s construction engineer) and Leighton’s engineer would conduct the joint formal inspection for rebar fixing (which I discuss further below);
- (e) Once the MTRCL’s construction engineer (or MTRCL’s Inspector of Work as delegated by its construction engineer) had approved the rebar fixing inspection, Leighton’s engineer may then conduct further checks to ensure that the area was ready for concreting. Generally, the practice was to arrange the concreting preparation work and rebar fixing work simultaneously to reduce delay;
- (f) Once the preparation works before concreting were completed, MTRCL’s Inspector of Works and Leighton’s engineer would conduct the formal joint inspection for the pre-pour check;
- (g) It was standard practice for the MTRCL’s construction engineer / Inspector of Works to verbally approve the inspected works and authorise Leighton to proceed immediately after the formal joint inspections. The only exception would be if MTRCL required rectification work. If the defect was minor, Leighton would ensure that such remedial work was completed immediately by the subcontractor during the joint inspection. If more time was required to complete the rectification work, Leighton’s staff would check the work later

before arranging a further inspection with MTRCL. MTRCL's construction engineer / Inspector of Works would subsequently inspect the rectification 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 joint inspection. This allowed works to continue without delay. Thereafter, MTRCL's construction engineer / Inspector of Works would complete the RISC form to record their approval and return it to Leighton later.

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

- (a) The inspections of rebar fixing comprised 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 rebar samples in the area to be inspected and check whether the rebar complied with the working or agreed drawings; and
 - ii. with reference to the measured samples, conduct visual check across the area to ensure that there was consistency of the spacing and lapping of the rebar;
- (b) The inspections were conducted jointly by MTRCL's construction engineer (or MTRCL's Inspector of Work as delegated by its construction engineer) and Leighton's engineer.

RISC Forms

- 17. I was one of the engineers who was responsible for the formal joint inspections for rebar fixing and pre-pour checks at the SAT EWL Area.
- 18. For the RISC forms that I had submitted for the formal joint inspections, they were issued and submitted around the time of a formal joint inspection or in the days thereafter. As noted, it was standard practice for Leighton to continue working once it obtained MTRCL's verbal approval after a formal joint inspection. This allowed work

to continue without delay. MTRCL's staff was aware, and had no objection, of this standard practice.

19. Leighton has disclosed a table summarising the records of the formal joint inspections for rebar fixing and pre-pour checks for the SAT EWL Area (numbered **LCAL.SAT.2.01** in the Second Index of Documents disclosed by Leighton ("**Index**"). This table indicates that I submitted the RISC forms for the formal joint inspections at the "hold points" with the exception that I did not submit forms for 18 out of the 24 relevant formal joint inspections in that area. The details are as follows:
 - (a) I did not submit a RISC form for 9 out of the 12 rebar fixing inspections; and
 - (b) I did not submit a RISC form for 9 out of the 12 pre-pour checks.

20. The reason why I did not submit those RISC forms is that I was constantly busy supervising the works in order to meet the progress, completing inspections and attending to other necessary tasks such as all sorts of paperwork and co-ordination to avoid causing delay to the works, but not limited to the SAT EWL Area. I did not have time to prepare all of the RISC forms and review those which I had issued in order to consider if I had missed any.

21. For those formal inspections in the SAT EWL Area where I forgot to issue a RISC form, I confirm that:
 - (a) MTRCL's construction engineer (for rebar fixing inspection) or Inspector of Works (for pre-pour checks or, when delegated by MTRCL's construction engineer, rebar fixing inspection) was contacted when each "hold point" was reached;
 - (b) MTRCL's construction engineer / Inspector of Works conducted the formal joint inspection (as described above) with Leighton;
 - (c) Verbal approval from the MTRCL's construction engineer / Inspector of Works was always obtained before work was allowed to proceed or concrete to be poured. The only exception was if the MTRCL's construction engineer / Inspector of Works required rectification work to be done. If the defect was minor, remedial work was completed immediately by the relevant subcontractor during the joint

inspection. If more time was required to complete the rectification work, a further joint inspection would be arranged with MTRCL. In those cases, the MTRCL's construction engineer / Inspector of Works subsequently inspected the rectification work and gave their verbal approval; and

- (d) It was agreed and understood with the MTRCL's construction engineer / Inspector of Works that the formal joint inspections should proceed even if a RISC form had not been completed.

22. I note that MTRCL's site diary entries recorded the rebar fixing works and the preparation work prior to concreting for the SAT EWL Area that were carried out before, and were inspected by MTRCL and Leighton during, the formal joint inspections. The rebar fixing inspection was conducted on or as soon as possible after the completion of the rebar fixing works, so as to allow works to continue without causing delay to the progress, while the pre-pour check was carried out on or shortly before concreting. I also note that the time and volume of the concrete pours were stated in the site diaries. Furthermore, there are concrete test results which prove the date of those concrete pours in the relevant areas and confirm that MTRCL was aware of the pours. These site diary entries and concrete test results have been disclosed to the Commission under section **LCAL.SAT.2.02** in the Index. If a permit to load (TW4) was required for the formwork prior to concreting, I would arrange formwork inspection by Leighton's Temporary Works Coordinator ("TWC"). The TW4 would be issued after the TWC had inspected and approved the formwork. A copy set of the TW4 forms have been disclosed to the Commission under section **LCAL.SAT.2.02** in the Index.

23. For the areas that I was responsible for, I can therefore confirm that:

- (a) all formal joint inspections for rebar fixing and pre-pour checks were carried out and approved by MTRCL; and
- (b) concrete was poured after "hold points" were inspected and MTRCL authorised Leighton to proceed with the concrete pour.

Testing of rebar

24. For the areas that I was responsible for in the SAT EWL Area, I ordered the necessary rebar and arranged for the testing of the rebar, apart from the rebar ordered by my colleagues. The practical aspects of the rebar testing were as follows:
- (a) I would order a batch of rebar and inform the MTRCL's Inspector of Works when the batch was delivered to site;
 - (b) The MTRCL's Inspector of Works would select samples from the batch to be cut and labelled for testing;
 - (c) Thereafter, the MTRCL's Inspector of Works 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.
25. I was diligent in arranging for the sampling and testing of rebar that I ordered for the SAT EWL Area. 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 Mill Test 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

26. At some locations in the Project, it was necessary to connect some rebar by using couplers (instead of lapping bars together) at some construction joints in order to ensure that access to all areas of the site could be maintained. These access routes were required for logistical purposes. It was critical that people and vehicles could move down these access routes, which would not have been possible if continuous lapped bars had been installed across those routes.
27. 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 construction engineers / Inspectors of Works were on site for many hours each day and would have

seen the couplers being installed. They would also have inspected the couplers as part of the formal joint inspections for rebar fixing and pre-pour checks at the construction joints.

The works are safe

- 28. 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.
- 29. In my personal opinion, I believe that the works that I supervised are safe and properly constructed.

Dated the 16 day of May 2019.

Signed: 

Raymond Tsoi