

**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**

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**WITNESS STATEMENT OF WU KA WAH CARL  
FOR  
MTR CORPORATION LIMITED**

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I, **WU KA WAH CARL**, of MTR Corporation Limited, MTR Headquarters Building, Telford Plaza, 33 Wai Yip Street, Kowloon Bay, Hong Kong, **WILL SAY AS FOLLOWS:**

1. I am providing this witness statement in response to various matters raised in a letter dated 27 July 2018 from Messrs Lo & Lo ("**Letter**"), who I understand are the solicitors acting for the 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 ("**Commission of Inquiry**"). In this statement, I shall address the matters listed as items 7, 8(e), 11(b) and 20 of the Letter.
2. While I am aware of the matters raised in items 7, 8(e), 11(b) and 20 of the Letter based on my first-hand observations and personal involvement in the SCL Project from 2016 to the present and I confirm that the contents of this statement are true to the best of my knowledge and belief, there are occasions when I can only speak to matters by reference to MTRCL's documents due to the lapse of time, in which case I believe the contents of those documents are true and correct.
3. I first joined MTR Corporation Limited ("**MTRCL**") in 1994 as Quality Assurance Engineer I in the Quality Assurance team ("**QA team**") of the Projects Division, and I remained in that team until May 1999. I then worked in the Safety & Quality Department of the Operations Division from June 1999 until August 2008, and in the Corporate Responsibility Development team of the Legal Department from September 2008 until January 2010. Thereafter, I returned to the Safety & Quality Department of the Operations Division until March 2011, after which I was transferred back to the QA team

of the Projects Division and became the Project Quality Manager in March 2011. I remained in that role until January 2015, when I became the Manager-Special Projects. I then became the Coordination Manager of the Express Rail Link (“XRL”) from September 2015 to May 2016.

4. I am currently the Coordination Manager for the Shatin to Central Link Project (“SCL”). I have been in this role since May 2016. I have worked part-time in this position since February 2017.
5. I obtained a Bachelor Degree (Civil Engineering) from Southern Illinois University, USA in 1975, and in 1978, I obtained a Master’s Degree (Engineering Mechanics and Materials) from the same University.
6. Unless otherwise stated, I give evidence based on my personal knowledge or belief. There are occasions when I can only speak to matters by reference to documents, in which case I refer to those documents.
7. My main responsibilities as the Coordination Manager for SCL include:
  - (a) collating materials and editing presentation materials and reports for the SCL-related aspects of the Executive Committee meetings; and
  - (b) in respect of SCL meetings between the Railway Development Office (“RDO”) and MTRCL, liaising between RDO and MTRCL Projects Division attendees as to meeting minutes and follow-up action lists.

**Item No. 7: Describe and explain Your Company's system and measures in place at the material time to ensure that the steel bars in the diaphragm walls and platform slabs were properly installed and connected in compliance with Requirements, Standards and Practice and that any irregularities, non-compliances and defects will be reported and addressed by the appropriate parties and/or persons.**

8. In my response to Item No. 7, I shall make reference to the Commission of Inquiry's Terms of Reference (b)(i), which enquires as to the adequacy of MTRCL's:
  - (a) project management and supervision system;
  - (b) quality assurance and quality control system;

- (c) risk management system;
- (d) site supervision and control system and processes;
- (e) system on reporting to Government;
- (f) system and processes for communication internally and with various stakeholders;
- (g) any other related systems, processes and practices;
- (h) implementation thereof.

### **Project management and supervision system**

#### *International Certification and comments from Independent Organisations on PIMS*

9. MTRCL has established and put in place a Project Integrated Management System ("**PIMS**"). The PIMS is a set of project management documents setting out the procedures and practices for MTRCL staff to follow and has been used in managing MTRCL's railway projects for over 20 years.
10. From 1994 to now, MTRCL has followed the PIMS and successfully delivered many major rail projects, including the Airport Express Line (AEL), the Tseung Kwan O line (TKL), the Disneyland Resort Line (DRL), the West Island Line (WIL), the Kwun Tong Line extension (KTE) and the South Island Line (SIL), and now the Express Rail Link (XRL) (which is scheduled to commence operations in late September 2018 and which MTRCL will operate in the near future) all of which are healthy and in operation or will be operating soon. This is clear evidence of the adequacy, suitability and effectiveness of the PIMS for railway projects that is tried and tested, and working well.
11. The PIMS has always been designed to be compliant with ISO 9001 international standards. These sets of international standards are in respect of quality management systems. They set out requirements including but not limited to design and development, design verification and validation, control of design changes, control of non-conforming products, corrective / preventive actions, and training of personnel. The events which are the subject of the Commission of Inquiry took place in the period from about 2015 to 2016. For that period, the applicable ISO 9001 versions were ISO 9001:2008 and also ISO 9001: 2015.

12. In order to be compliant with ISO 9001, the PIMS must set out, amongst other things, MTRCL's policies and definitions as to what constitute (i) the requisite quality, (ii) the personnel involved with setting up and maintaining such quality standards, (iii) the plans to equip staff with the relevant knowledge and training, (iv) oversight via internal audits, (v) the monitoring and reviewing mechanism, (vi) the plans to address risks, (vii) resources in the form of people, tools, materials and methods, and (viii) the retention and promulgation of knowledge. Annual compliance audits are carried out by external auditors in respect of the PIMS in the ISO 9001 certification, and the results for every year since 1995 show that the PIMS and Project Division's implementation of the PIMS are compliant with the ISO 9001 standards applicable at the time. I understand that the most recent compliance audits were conducted by Bureau Veritas in May 2016, May 2017 and May 2018. Both the May 2016 and 2017 reports state that MTRCL's PIMS is confirmed to have been "*maintained systematically and no adverse comment was found*", while the May 2018 report states "[PIMS] *is maintained as planned. Capability of the system was demonstrated. No adverse finding was identified*". I understand that further details of these audits will be provided by Mr C. K. Yeung, Senior Quality Assurance Engineer of the QA team ("**Mr. Yeung**") in his witness statement.
13. Aside from certification to international standards, the robustness of the PIMS has also received endorsement from independent organisations. In April 2008 when the XRL Entrustment Agreement relationship with Government was being developed, the PIMS was reviewed by an independent organisation, Lloyd's Register Rail (Asia) Limited on behalf of Government. In the report issued by the Independent Expert Panel ("**IEP**") chaired by the Hon. Mr. Justice Michael Hartmann, GBS in December 2014 and titled "*Hong Kong Section of the Guangzhou-Shenzhen-Hong Kong Express Rail Link*", it was stated that "*Lloyd's Register was of the opinion that MTRCL's project management processes and controls "are known to be robust and in line with industry best practice. They are regularly reviewed and audited by outside bodies and have been proven and refined through the delivery of many high-quality railway projects by MTRCL in Hong Kong and abroad.*". Furthermore, the IEP noted that "*independent assessments in 2009 (by Ernst and Young and by Scott Wilson Business Consultancy) also found that MTRCL's project controls were "appropriate", and stated that "the Panel is of the view that MTRCL's contract management is exemplary.*"

### *Development of PIMS*

14. When I joined MTRCL's QA team in 1994, the development of the PIMS was at a very early stage. My first mission was to get it certified to ISO 9001 international standards for the "*Project Management of New Railways*" (which, as its name suggests, pertains to the construction of new railways). During the time I was in the QA team from 1994 to 1999 and from 2011 to 2015, I was very much directly involved in maintaining and updating the PIMS on a regular basis to ensure that the system was kept abreast with international practice and standards. I was also involved with the integration of the MTRCL and Kowloon-Canton Railway Corporation's project management systems when the two entities merged in 2007/2008.
15. The procedure to develop the PIMS is set out in PIMS/PN/02-1 "*Preparation of PIM Procedures and Practice Notes*" paragraphs 3 to 5.4.4. Generally, the General Managers, Department Heads and division managers of the Projects Division have the responsibility to identify the need for new PIMS documents. These individuals then nominate staff members to draft and develop the PIMS documents. The PIMS documents are also reviewed by the Project Quality Manager to ensure, amongst other things, that the implementation is workable, the PIMS documents would fulfil the ISO 9001 requirements, and that they are auditable.
16. It is also important to note that the PIMS are not meant to be prescriptive and supplant the professional judgment of the project managers, construction managers, construction engineers, surveyors and works inspectors who are educated, trained, qualified and experienced in their respective spheres of responsibilities. In my experience, a successful project management system is a combination of having a solid framework of tested guidelines and procedures and having the people with the ability to be resilient and adapt to developments and changing circumstances based on rational and experienced professional judgment to implement it.

### *Overall structure of PIMS*

17. The general set of the PIMS is not specific to any one project. However, there is a Project-specific Management Plan for SCL which is entitled SCL/PIMS/MPS/01

"*Project-Specific Management Plan*" which, amongst other things, identifies how standard practices defined in the PIMS will be applied to SCL specific requirements (including the requirements of Government as the client), and sets out the documents which define the SCL objectives and requirements and the standards and specifications used to facilitate the achievement of such objectives.

18. There are three tiers of PIMS documents. The top tier is "*Manuals*", which explain the reasons why MTRCL does certain things. The second tier is "*Procedures*", which explain what should be done. The third tier is "*Practice Note*", which explains how the relevant work should be done and what type of records should be kept. The scope of "*Procedures*" includes wide ranging areas such as staff resource management, risk management, planning, the environment, construction management, design management, testing and commissioning of railway systems, and statutory compliance. The PIMS is intended to be a mini-encapsulation of the foregoing matters. The PIMS documents are listed in the "*Master List of PIMS Documents*" which is updated from time to time.

#### *Proper implementation and audit of PIMS*

19. There are also mechanisms in place to ensure the proper implementation and auditing of the PIMS which will be addressed further below and in the witness statements of other interviewees.

#### *Continuous enhancement and review of MTRCL's project management system*

20. In accordance with the requirement of ISO 9001, the PIMS Steering Group ("**PIMSSG**") reviews the PIMS at least once every year to confirm its continuing suitability, adequacy and effectiveness, and assess opportunities for improvement and ascertains whether changes to the Project Integrated Management policy, objectives or the PIMS documentation are required. The PIMSSG is chaired by the Projects Director or his delegate and its members include the General Managers of the Projects Division, the Head of Project Engineering and the PQM. At each meeting, the different teams within Projects Division highlight for discussion quality performance issues or concerns, PIMS implementation, audits performed, and lessons learnt resulting in improved project delivery.

21. There is also process under PIMS/PN/02-6/ "*Lessons Learnt Process*" by which staff members in the Projects Division may share their experiences with others on the MTRCL intranet. Some of the subjects on which staff members may share lessons include construction management, statutory submissions and design coordination.
22. Furthermore, as a response to the recommendations from the IEP with respect to the XRL project, specific actions have also been implemented to further enhance MTRCL's project management system. For example, progress reporting has been enhanced, including the addition of Schedule Recovery Index in monthly progress reports, with traffic lights to indicate the status.
23. Other measures to enhance MTRCL's project management system include establishing Self-Quality Audits in around 2013 and an additional Project Quality Compliance Unit within the QA team (which covers railway products quality control at suppliers' premises outside Hong Kong) in around 2012.
24. There is also a continuous review of the PIMS to ensure they accurately reflect any developments and changes. For example, SCL/PIMS/MPS/01 "*Project-Specific Management Plan*" has undergone four revisions to ensure the continuing accuracy of such items such as the set of project definition documents, the organisation chart, and programme dates.

#### **Quality assurance and quality control system**

25. As part of the MTRCL's project internal controls, the effective implementation of the PIMS by the project team(s) is subject to regular audits by the in-house QA team which is independent of any project delivery and is led by the PQM.
26. As stated above, MTRCL has also implemented Self Quality Audits (under PIMS/PN/01-4 "*Self Quality Audit*") within the Projects Division to enhance compliance with the PIMS. This is an arrangement whereby different teams from different contracts cross-audit one another.
27. I understand that Mr. Yeung will provide further details of these audits in his witness statement. He is in a better position than I am to provide such details, as he was part of the QA team at the material times.

## **Risk Management System**

28. The Project Division's general risk management process is prescribed in PIMS/P/04/A2 "*Risk Management*". Project team members, consultants and contractors take part in the identification and control of risks relevant to the project according to a risk hierarchy: safety & service risks at the bottom, project delivery risks in the middle, and enterprise risks at the top. The risk status and measures to mitigate the risks are discussed at the project's monthly progress meetings.

## **Site Supervision and Control System and Processes**

29. The PIMS which are most relevant to the Commission of Inquiry's issues concerning site monitoring and construction are as follow:
- (a) PIMS/P/11/ "*Construction Management*"
  - (b) PIMS/PN/11-4/ "*Monitoring of Site Works*"
  - (c) PIMS/PN/11-1/ "*Site Meetings and Reports*"
  - (d) PIMS/PN/01-3 "*PIMS Management System Audits*"
  - (e) PIMS/PN/11-15 "*Inspection for Construction of Large Diameter Bore Piles, Barrettes, Diaphragm Walls and the Like*".
30. I understand further details of the site supervision, and control system and processes that occurred in Contract 1112 will be provided by individuals in the Construction Management team, who are in better positions than I am to explain these system and processes, as they were involved in the day-to-day implementation of these system and processes.

## **System on reporting to Government**

31. As set out in PIMS/MAN/004 "*Organisation and Management Responsibilities*", various departments within MTRCL have the responsibility of interacting with Government on their respective areas of work. Such MTRCL departments include the Project



Engineering Department, the Civil & Planning Department, the Project Safety Department, the Project Management Department the and Town Planning Department.

32. Elsewhere in the PIMS are references to the need for numerous meetings for various purposes, including on topics such as cost control, site safety, land surveys, electrical and mechanical works, the environment, design, consultant's/contractor's performance report, and audit. A number of these meetings are attended by Government departments, including the RDO, the Labour Department and the Fire Services Department. (See, for example, PIMS/MAN/005 "*Project Management and Control*").
33. Aside from the PIMS, the SCL Project Management Plan also includes a 3-tier meeting protocol at working level, management level and senior management level.
34. I understand that further details of the particular meetings which are relevant to the issues raised by the Commission will be addressed by the relevant managers and Construction Management team members in their witness statements.

#### **System and processes for communication internally and with various stakeholders**

35. As stated above, the PIMS also refers to the need for meetings across all levels of MTRCL for various purposes. Again, I understand that further details of the particular meetings which are relevant to the issues raised by the Commission will be addressed by the relevant managers and Construction Management team members in their witness statements.

#### **Any other Related Systems, Processes and Practices**

36. I am not aware of any other systems, processes and practices which relate to the issues raised by the Commission.

#### **Implementation of PIMS**

37. The above-mentioned PIMSSG maintains oversight of the effective deployment of the PIMS for managing railway projects delivery. At each PIMSSG meeting, the General Managers present and explain the implementation of the PIMS at their particular project or section, and the PIMS may be further enhanced based on these findings.

38. All staff are required to ensure that they are aware of the requirements contained in the latest version of the PIMS Documents, and managers shall ensure that their staff fully comply with them (see paragraph 5.7.1, PIMS/PN/02-1 "*Preparation of PIM Procedures and Practice Notes*"). Frontline MTRCL staff, like all others, are also requested to enrol in induction training when they join the company. This training gives an overview of the PIMS systems and practical guidance in terms of how, for example, to use ePMS, which is a web-based information and document workflow processing system within MTRCL. All the PIMS documentation is also located in MTRCL's intranet in the iShare, which is a platform for Projects Division staff to share knowledge internally. Each time a new version of a particular PIMS document is issued, it is circulated to all staff by email. Each project's monthly progress report will also state there are new PIMS documents available.

**PIMS not relevant to the Issues raised by the Commission**

39. For completeness' sake, I also explain briefly why some of the PIMS documents which, although they may appear relevant by reason of their titles, are not actually directly relevant to the issues raised in the Letter.
40. PIMS/PN/11-6 "*Entrusted Works*" concerns entrusted works that are incidental to a project. It is not applicable to the SCL where the whole of the project is entrusted to MTRCL by Government. PIMS/P/14 "*Management of Operations Project*" concerns modification works of the existing operating railway, e.g. adding a lift after the completion of a project, and is also therefore not relevant to the works covered under Contract 1112. Furthermore, PIMS/PN/04-4 "*Systems Assurance Audit on Consultants and Contractors*" concerns E&M railway systems, so it is not relevant to the construction of the slabs or the diaphragm wall.

**Item No. 8(e): Following Your Company's knowledge of the relevant events and occasions, please describe and explain what steps and measures were taken by Your Company to (i) investigate the Defective Steel Works; (ii) alert and report the matter to the Main Parties and the Government or any of them and (iii) rectify the Defective Steel Works.**

*February 2017 Review*

41. At around the end of 2016 or at the beginning of 2017, Mr. T. M. Lee (GM-SCL & Head of E&M Construction) and subsequently, Mr. Aidan Rooney (GM-SCL Civil – NSL) ("**Mr. Rooney**") contacted me in respect of carrying out a review of the inspection records for the coupler installation in Contract 1112. Although this was not related to my normal duties at the time as the SCL Coordination Manager, I agreed to assist because I was familiar with how audits are conducted. Mr. Peter Fung of the QA team was assigned to assist me in this exercise.
42. The scope of our review was to examine the construction records in order to confirm whether the steel reinforcement and couplers for the East West Line track slab of Contact 1112 for the SCL at Hung Hom Station had been installed according to the requirements of the relevant quality assurance and quality control regimes. Based on a random sampling of these documents reviewed, we prepared a review report with specific recommendations which was subsequently appended to the MTRCL Report under item 6.4 of the Technical Submissions.
43. While the review report recommended that the systematic maintenance of specific records could enhance the robust demonstration of the compliance with relevant QA/QC regimes, it was concluded that the steel reinforcement and couplers for the track slab had been installed in accordance with QA/QC regimes as stipulated under the PIMS and Leighton Contractor (Asia) Limited's Construction method statement, namely, the Quality Supervision Plan (which is the quality assurance scheme required by Buildings Department).

*MTRCL Report of 15 June 2018*

44. After the initial media reports alleging the cutting of reinforcement bars had appeared in around end of May 2018, Mr. Rooney asked me to participate in the preparation of the MTRCL report which had to be submitted to the RDO (the "**MTRCL Report**"). Overall, I took on an editorial role and helped to gather voluminous information which occurred many months ago on complex construction matters for the purposes of the MTRCL Report, which had to be completed within a period of two weeks.
45. Initially, Mr James Ho (SConE) provided a draft on 2 June 2018 to me and Mr Michael Fu (Construction Manager), and I started collecting comments from various teams (including the Design Management team and the Construction Management team) for the

purpose of my developing and providing comments on the draft. I also provided the Legal Department with documents I collated from colleagues, such as Request for Inspection and Survey Check ("RISC") forms from the Construction Management team. Eventually the Legal Department took over the drafting of the MTRCL Report, though I continued to provide to them comments and documents.

**Item No. 11(b): Please identify the person or persons responsible for preparing the MTRCL Report.**

46. I was involved in the preparation of the MTRCL report as discussed in the response under Item No. 8(e) above.

**Item No. 20: In the light of Your Company's response to foregoing paragraph, and in relation to paragraph (c) of the Terms of Reference, describe and explain, from the perspective of a project manager in a large scale project involving multiple parties and stakeholders, and the only operator of Hong Kong's railway system serving the general public, the suitable measures which could be taken in the future to promote public safety and assurance on quality of works.**

47. In June 2018, a team comprising MTRCL Engineering and Projects Division staff was formed to review MTRCL's site supervision system and communication system for the SCL in response to request from RDO. This review recommended various improvement measures, which were set out in a letter from MTRCL to RDO dated 6 July 2018.
48. One improvement action concerns the introduction of a system for categorising works related Non-Conformance Report ("NCR"). MTRCL has since put in place a management protocol for escalating the NCRs upwards. Furthermore, a review of NCRs is now carried out on a weekly basis amongst the Construction Management team members of each contract. A register of works NCR of open status has been submitted to RDO on a weekly basis since 17 July 2018.
49. There is also an initiative to put in place some structure for using smartphone applications to capture and report quality issues. MTRCL is exploring how to implement a more secure method of communication to enable frontline staff to promptly and conveniently capture information at the site which can then be downloaded to a specific location for the senior staff to review or to draw their attention to certain issues. This smartphone application is being piloted at two major civil contracts at the SCL. If

successful, there will be a wider application of this initiative. In due time there will also be a protocol as to how frontline staff may use this application to report to their seniors or even higher level staff if they need support or guidance.

50. A Project Division Quality Working Group has also been set up, and this group has organised experience sharing and training sessions for MTRCL staff. To date, four experience sharing sessions have been delivered with a good turnout of Engineers and Inspectors, covering topics such as QSP; On-site QA / QC processes for couplers; managing NCRs; and keeping records systematically.
51. Finally, I would like to mention the following:
  - (a) The events in question and which form the subject matter of the Commission of Inquiry took place several years ago and my recollection of every detail is not therefore perfect.
  - (b) Accordingly, in preparing this witness statement I have reminded myself of the events in question by reference to various hard copy and electronic documents and materials, including contemporaneous email correspondence, meeting minutes and other records. I understand these materials were retrieved by MTRCL's Legal Department, with the assistance of the MTRCL's external lawyers, Mayer Brown.
  - (c) The hard copy documents were: (1) extracted from physical files kept at the Hung Hom site office or the Hung Hom main office of MTRCL; (2) printed from the MTRCL's "Electronic Project Management System" (ePMS); or, (3) printed from other electronic sources in response to the matters specifically raised by the Commission of Inquiry or matters which were discussed in the course of preparing this witness statement.
  - (d) I understand that MTRCL's Legal Department and external lawyers have recently established a database using software named *Relativity* which has captured a large amount of data from hard disk drives, including some of those that stored my emails and other electronic documents for the relevant period. I understand that they have commenced the process of identifying specifically relevant documents by use of search terms and date ranges and that this is an

ongoing process due to a large volume of data. I have been presented with some of the documents identified from *Relativity* during the last week or so and commented on these in appropriate sections of this statement.

- (e) I would like to add, therefore, that there may be matters referred to or stated in other documents which have not been recently placed before me. To that extent, I would be happy to comment on any such other materials at a later date if and when identified and placed before the Commission of Inquiry.

**Dated 13<sup>th</sup> September 2018**



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**WU Ka Wah Carl**