

**The Extended Commission of Inquiry
into the Hung Hom Station Extension
under the Shatin to Central Link Project**

**Joint Statement of
Project Management Experts**

Without Prejudice

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Joint Statement of Project Management Experts

1. This Joint Statement has been prepared by Mr. Steve Rowsell (Project Management Expert for the Commission), Mr. Steve Huyghe (Project Management Expert for MTRCL) and Mr. George Wall (Project Management Expert for Leighton). The Expert Reports produced by Mr. Huyghe and Mr. Wall were required by the Commission to be responsive to the project management issues identified in Mr. Rowsell's Expert Report. We met on 3rd September 2019 in London and held subsequent telephone conferences and discussed on a without prejudice basis all of the relevant project management topics¹ as set out in Mr. Rowsell's Expert Report.
2. In relation to project management, Mr. Rowsell was instructed to review and report on the adequacy of the relevant aspects of the MTRCL's project management systems etc., in the light of the matters set out in paragraph (a) of the Commission's Expanded terms of Reference.
3. Mr. Huyghe was further instructed by Messrs. Mayer Brown to prepare a Supplemental Expert Report ("**Huyghe Report 2**"), based upon the Directions given by the Commission on 24 September 2019 to provides further opinions regarding Leighton's project management procedures. and performance and how they may have caused or contributed to the work which is the subject-matter of the Extended Inquiry.
4. Mr. Rowsell has reviewed Mr. Huyghe's Report 2 and has taken it into consideration with regards to Joint Statement.
5. Mr. Wall disagrees that Mr. Huyghe's Report should be considered.
6. This Joint Statement follows on from a similar statement produced by Mr. Rowsell and Mr. Huyghe covering project management issues discussed during the Original Inquiry. In the Joint Statement covering the Original Inquiry suggestions were put forward on how MTRCL could improve aspects of its project management systems and procedures. The further suggestions set out in this Joint Statement should be read in conjunction with the Joint Statement for the Original Inquiry.
7. We have reached agreement on the many of the major project management issues as set out in this Joint Statement. Our independent expert reports set out the full list of conclusions and recommendations we have each identified. Mr. Wall has identified some disagreements where Mr. Roswell and Mr. Huyghe have reached agreement and they are listed in Paragraph 47.

¹ Mr. Huyghe's Report and Mr. Wall's Report do not address the issues pertaining to the Government's monitoring and control mechanism.

A. MTRCL'S OVERALL PROJECT MANAGEMENT OBLIGATIONS

8. In the Joint Statement for the Original Inquiry it was agreed that MTRCL is a very experienced organization with extensive experience and capability in the planning, delivery and operation of railway networks and systems in Hong Kong². It was also agreed that Leighton is a well-recognized construction company with an extensive history in providing construction services in both Hong Kong and internationally. However, with even the most experienced companies, we are agreed that it is normal that some mistakes or oversights will inevitably be made in the performance of works of such scale and complexity. However, procedures should be in place to mitigate errors and enable the works to be executed in a professional manner.
9. MTRCL's overall project management obligations were covered fully in the Joint Statement for the Original Inquiry. We agree that the obligations are defined and set forth in the Entrustment Agreement (EA3), MTRCL's PMP, PIMS, BD's Instrument of Exemption, BD's Code of Practice for Site Supervision 2009, and the contract 1112 documents between MTRCL and Leighton.

B. MTRCL'S PROJECT MANAGEMENT PLAN (PMP) AND PROJECT INTEGRATED MANAGEMENT SYSTEM (PIMS)

10. We agree that MTRCL has put considerable effort over the years into developing its Project Integrated Management System (PIMS) which has achieved ISO 9001 accreditation for the project management of new railways. We agree that PIMS provides a robust basis for the development and implementation of project specific plans and procedures, but we have identified some aspects that we consider should be reviewed and updated.
11. Leighton has indicated in the evidence given by its employees that it is continually improving its systems to further enhance their effectiveness (as described in the witness statement of Mr Dean Cowley). We welcome and encourage these efforts by Leighton.
12. Suggestions were set out in the Joint Statement for the Original Inquiry for potential improvements to be made to PIMS. We are aware that MTRCL are in the process of reviewing and improving their procedures based the findings of the Turner & Townsend Report and also on the findings of the Original Inquiry. We welcome and support that work which was described in the evidence provided by Dr Peter Ewen, MTRCL Engineering Director³. In relation to the specific project management issues examined by the Extended Inquiry, we recognise that improvements that MTRCL have been developing and implementing will help to prevent recurrences of these issues. In our opinion we consider that the following aspects of MTRCL's review of its project management procedures are the most significant in addressing the issues examined in the Extended Inquiry:

² Original Inquiry Joint Statement §3.

³ See Appendix A – Dr Peter Ewen – List of Improvements

- a. Strengthen the procedures setting out the roles of MTRCL's leaders in establishing and embedding appropriate culture, values and behaviours throughout the organisation.
- b. Review arrangements for training staff in the use of PIMS and consider the development of training modules focused on the requirements of specific roles, including the introduction of updates and revisions to PIMS procedures.
- c. Review processes for planning resource levels and identify potential resource pressures which could improve quality management.
- d. Review the current advice and procedures in relation to the issue and monitoring of non-conformance reports.
- e. Develop clearer and more comprehensive guidance for site record keeping, including the use of photographs, supported where possible by technology solutions and devices.
- f. Consider the development of a PIMS procedure for the development of project communication strategies and systems.
- g. We understand that a wide range of improvement measures are being implemented by MTRCL regarding leadership, the independent Quality team, which is being set up, the review of the PIMS, training and competence mapping, and use of technology for supervision/inspection, record-keeping and communication.

13. Suggestions were also set out in the Joint Statement for the Original Inquiry for potential improvements to be made to the content of the Project Management Plan (PMP). We agree that the PMP is intended to be a strategic document which covers the project management of the overall Shatin to Central Link (SCL) project. Based on the evidence examined by the Extended Inquiry we consider that it would be desirable for the standard content of PMPs for similar future projects to cover additional aspects of project management at a strategic level as follows:

- a. The inclusion of a section on resource planning and monitoring.
- b. Training and development arrangements for project specific purposes.
- c. The development of project communication strategies.
- d. Coverage of interface risk planning and management.
- e. A stronger focus on the role of senior leaders in establishing appropriate culture and behaviours.

14. We consider that the above additions to the PMP should be covered at a strategic level and not in the detail required for contract specific management plans. We also understand that the PMP and PIMS documents are under review and may be revised to address some of these considerations. The inclusion of the above additions in the PMP should help to ensure that they are recognized as key aspects of successful project delivery planning and provide the Government with greater confidence that successful project outcomes will be achieved.

C. RISC FORM AND INSPECTION PROCEDURES

RISC Form Procedures

15. We agree that the requirements for inspection planning, notification and execution, including the application of RISC Form procedures, are set out in a range of documents including the 1112 contract, the general specification, the particular specification, various PIMS procedural documents and the PMP.
16. Mr. Rowsell and Mr. Huyghe agree that MTRCL did establish a RISC administrative system. However, with regards to the NAT, SAT and HHS areas, Leighton did not submit RISC Forms for all formal inspections and MTRCL continually requested that the RISC forms be provided but did continue to carry out inspections in the absence of all RISC Forms. A series of NCR's were later issued by MTRCL on 16 April 20184 and 6 July 20185
17. Mr. Rowsell and Mr. Huyghe agree that due to not receiving all the RISC forms from Leightons, MTRCL should have eventually conducted joint meetings to come up with a formalized alternative process. It is apparent that this was not done by those involved as both parties were focused on not affecting the progress of the work.
18. We suggest that training with regards to providing a more user-friendly RISC process procedure is strengthened to address the responsibilities of both the Contractor and MTRCL. It is important that RISC form procedures are followed by the Contractor and insisted upon by the Engineer to the contract in case situations arise which lead to the quality of the works being called into question. If the RISC form procedure is not being followed, that there are specific contractual remedies available to the Engineer to take the appropriate actions
19. We cannot be certain from the evidence we have seen what led to the use of alternative procedures to the RISC Forms being introduced but we agree that it is likely linked to the Leighton's staff stating they were too busy and apparently did not take into consideration that the time necessary to conduct the standard RISC process. We acknowledge that the RISC process was cumbersome, time-consuming.
20. We believe that both MTRCL and Leighton's engineers felt that the proper hold point inspections were being conducted and both were conscious of not delaying the Project.
21. We agree that PIMS procedures do recognise that there may be a need for flexibility, and they set out a requirement that there will be a cooperative approach when procedural problems arise. MTRCL did not insist on the minimum 3-day notice period for inspections even though they could have insisted on it. We are agreed that this notice period was not critical for MTRCL and Leighton's site team to conduct the necessary inspections because these staff were present on site and carrying out ongoing supervision of the works during construction. In practice, in most cases it would have been sufficient if Leighton's site team had submitted RISC Forms at any point prior to the inspections. For quality assurance purposes, the degree of cooperation shared between MTRCL and Leighton should not have been extended to conducting inspections and allowing work to proceed without Leighton's submission of RISC forms

22. We agree that the use of WhatsApp to arrange and record inspections did not provide an adequate or structured approach which met the requirements of an effective quality management system. We agree that WhatsApp or similar social media systems could be used as a useful communication tool, but it would require central coordination to form part of a quality management system.
23. We are agreed that for each of the NAT, SAT and HHS areas there are varying numbers of outstanding RISC Forms. The specific details are set out in the WSP report, which was prepared by MTRCL's consultants following an independent audit of the available records. The WSP report generally validated that the required hold-point inspections had been carried out in the NAT, SAT and HHS areas.
24. We agree that the current RISC Form procedures are time consuming and inefficient. We consider that they should be improved by making better use of technology solutions of the kind which Dr. Peter Ewen has explained in his evidence regarding MTRCL's current steps to improve these procedures.

Inspection Procedures

25. Notwithstanding the shortage of RISC forms, we agree that sufficient evidence has been provided (including wider documentary evidence and witness testimony) which indicates that inspections were carried out but not recorded in a structured way.
26. Despite inspections apparently having been carried out, we agree that the procedures were not effective in identifying Leighton's steel reinforcement installation problems subsequently discovered at the stitch joints in the NAT. We consider that likely contributory causes for the defects in the steel reinforcement fixing included:
 - a. In practice, the reinforcement was inspected by Leighton's engineers and MTRCL's inspection staff during routine and informal inspections. We agree that this is a contractual requirement under the provisions of Clause 60.1, of Leighton's Contract 1112 Examination of Work before Covering Up. We recognise that there may have been some difficulty for the Inspectors in visually examining steel reinforcement due to the constrained nature of the site and the complexity of the reinforcement work.
 - b. Inspections may have been signed-off despite the difficulty in carrying out effective visual surveys of the work.
 - c. Whilst the use of Lenton couplers was identified at an early stage at the interface stitch joints in the NAT area, it does not appear that the associated requirement for tapered reinforcement bars was communicated to Leighton's site teams Mr. Rowsell and Mr. Huyghe agree that annotated drawings would have helped to identify the Lenton couplers used on Contract 1111. A Method Statement should have been prepared by Leighton's for the couplers used in locations for site access.

- d. We agree that each PM expert has his views on how this type of problem can be addressed in the future that is set out in their respective reports.

27. In relation to RISC Form and inspection procedures, we recognise that MTRCL has been considering and developing improved procedures. We consider that the most important aspects of the procedures which require improvement to address the project management issues considered by the Extended Inquiry are:

- a. Investigate and introduce new technology-based RISC Form procedures which can be implemented by site staff more efficiently than the current procedures through the use of portable technology devices.
- b. Review its training strategies and plans to ensure that staff are provided with the necessary training required to perform their roles effectively. Training systems should be used to verify that individuals have the required skills, competences and experience to perform allocated roles and duties.
- c. Review responsibilities for ensuring that procedural non-compliances by the Contractor are addressed promptly to remedy the position in accordance with the provisions of the contract and that there are effective problem escalation procedures to allow senior management to intervene when necessary.
- d. Review its arrangements for future projects to ensure site staff are provided with the latest working drawings and to ensure that all staff have ready access to them to support reliable surveillance and inspection of the works.
- e. Review the preparation of ITPs to ensure that inspection proposals can be carried out effectively. Ensure that ITPs are reviewed and assured by people with adequate site experience.
- f. Review its lessons learnt procedures as incorporated in the PIMS manuals to ensure that when significant defects in the works or procedures are identified, there is always a proper and prompt investigation into the cause of problems.

D. NON-CONFORMANCE REPORTS

28. We are agreed that MTRCL should have considered alternative ways regarding to address the issue of Leighton not following RISC Form procedures in the NAT, SAT and HHS areas, including meetings to discuss alternative procedures and possibly issuing non-conformance reports (NCR) as they eventually did after the identification of the defects at the stitch joints in the NAT area. We are of the view that NCRs are a very valuable performance management tool and that there should not be a reluctance to use them when there are significant defects or non-conformances. We consider that the Contractor is more likely to take action to resolve problems when NCR procedures are used.

29. We suggest that MTRCL give consideration to enhancing the NCR procedures to increase their effectiveness as an early warning mechanism and to encourage their use to help ensure that problems are resolved promptly. This could be achieved by having different grades of NCR covering minor, medium and major non-conformances requiring different responses as appropriate. As an alternative, more robust use could be made of MTRCL's existing audit procedures.

E. INTERFACE RISK MANAGEMENT AND PLANNING

30. We agree that interfaces between contracts generally represent high risk areas for both MTRCL and Leighton who should include key risks in project risk registers and which should receive a close management focus.
31. We agree that the PIMS procedure documents identify interface coordination as a key process requiring a proactive approach to coordination and interface management. The procedure places a requirement on MTRCL to liaise with all contractors, however with regards to the differing coupler issue between Contract 1111 and Contract 1112, it was Leighton's responsibility to coordinate and comply with the requirements regarding to the interfaces between the Contracts and MTRCL responsibility to liaise with all contractors.
32. We agree that contractual responsibilities in relation to the contract interfaces between Contracts 1111 and 1112 were clearly set out in the Particular Specification at Appendix Z2 including obligations on both Leighton's and MTRCL's involvement in planning, inspection and in the exchange of information.
33. We agree that the planning of the interface work would have been helped by holding an early workshop, involving the relevant site people, to ensure that all issues had been addressed and that they understood the requirements and the Plan.
34. We agree that in relation to the 1112 contract requirements for interface risk management, Leighton acknowledges that its staff by their attendance at the interface meetings ought to have known that GKJV's couplers were of the Lenton type but unfortunately omitted to pass this information to the engineer responsible for supervising the rebar fixing works at the NAT Stitch Joints and the Shunt Neck Joint. Leighton has also acknowledged that there was miscommunication between the Leighton staff who attended the interface meetings (as set out in Leighton's closing submission). We also agree that not all members of Leighton and MTRCL's inspection team received technical training in the installation requirements of the different types of couplers used at the interface joints.
35. Training will help prepare those involved in the construction process and operations to ensure the contractors and inspectors are aware of the risks and give them a clear understanding of how to resolve any potential difficulties.
36. We agree that contractual responsibilities in relation to the contract interfaces between Contracts 1111 and 1112 were clearly set out in the Particular Specification at Appendix Z2 including obligations on both Leighton's and MTRCL's part in terms of planning, inspection and in the exchange of information.
37. In relation to the working drawing which set out a note constraining the timing of the execution of the stitch joint works, we consider that it should have included engineering criteria setting out how it would be established that it was safe for the construction work to be carried out. This would then have allowed the criteria to be monitored and discussed at the regular interface meetings. We accept however, that there is no suggestion that the timing of the interface work was not carried out as required. We note that the drawing

included in the evidence before the Extended Inquiry is marked up as being produced for BD submission purposes. We agree that this provided BD with the opportunity to comment on the potential inadequacies of the note setting out the constraint on the timing of the work but that it appears that no comment was made.

F. TESTING OF REINFORCEMENT STEEL

38. On the basis of evidence provided by Leighton, we understand that approximately 7% of the rebar used on the project was not tested by a HOKLAS accredited laboratory.
39. We understand that all steel delivered to site was accompanied by an appropriate mill certificate and that all of the steel that was tested successfully passed the specified tests.
40. We agree that the standards for the testing of steel reinforcement on the contract are set out in Construction Standard CS2:1995. We understand that CS2 has been subsequently revised and republished as CS2:2012. The revised standard includes a new definition of a “batch” which was not applied to the contract and which may have reduced the overall numbers of tests required.
41. A testing rate of 93% of the steel was used on the project, supported by the mill certificates and the successful testing of the steel samples, and this should provide a good degree of confidence in the quality of the steel.
42. We suggest that MTRCL, in relation to its role in overseeing the implementation of steel testing by the Contractor, consider the following:
 - a. Use audit arrangements to provide assurance that MTRCL is confident that all material delivered to site is tested by the Contractor before being incorporated into the works.
 - b. Review the specification requirements for identifying steel awaiting test results and ensuring that it is segregated and not used in the works before test results are available.

G. RECOMMENDATIONS IN MR. ROWSELL’S EXPERT REPORT

43. We agree with the recommendations for improving procedures as set out in Part 3 of Mr. Rowsell’s Expert Report, noting that Mr. Huyghe and Mr. Wall were not instructed to consider issues relating to Government’s monitoring and control mechanisms.
44. We are aware of, and we support the work being done by MTRCL to review and improve its procedures based on the findings of the Turner & Townsend Report. We also observe that MTRCL has already taken proactive measures as set out in Dr. Ewen’s statement. These measures include:
 - a. Digitalization of the site inspection process and the adoption of BIM;
 - b. Enhanced training of frontline staff for better implementation of PIMS;
 - c. Enhancements to the quality assurance system; and

d. Fundamental revision of PIMS.

45. We recognise therefore, that MTRCL is already looking at aspects of its project management procedures on which we have also made suggestions for improvement. However, we are not in a position, to confirm the details of that work or the progress achieved.

46. We consider that the matters discussed in our individual Expert Reports and in this Joint Statement should be used to help inform the review of project management procedures being taken forward by MTRCL.

47. Disagreements: Mr. Wall does not agree with paragraphs:

- a. Paragraph 4
- b. Paragraph 16
- c. Paragraph 17
- d. Paragraph 26c

Signed

Steve Rowsell

Commission's Project Management Expert



Steve Huyghe

MTRCL's Project Management Expert

George Wall

Leighton's Project Management Expert

Dated the 2nd day of October 2019