

**Legislative Council Panel on Transport
Subcommittee on Matters Relating to Railways**

**Shatin to Central Link
Incidents relating to the works at
To Kwa Wan Station and Exhibition Centre Station**

Introduction

This paper reports to Members on the incidents relating to the works at To Kwa Wan Station and Exhibition Centre Station under the Shatin to Central Link (“SCL”) project.

Background

2. SCL, with a total length of 17 kilometres, consists of the following two sections –

- (a) Tai Wai to Hung Hom Section: this is an extension of the Ma On Shan Line from Tai Wai via Southeast Kowloon to Hung Hom where it will join the West Rail Line; and
- (b) Hung Hom to Admiralty Section: this is an extension of the East Rail Line from Hung Hom across the Victoria Harbour to Wan Chai North and Admiralty.

3. There are ten stations in SCL. Apart from the existing Tai Wai Station, the SCL project involves construction of new stations or extension of existing stations at Hin Keng, Diamond Hill, Kai Tak, Sung Wong Toi, To Kwa Wan, Ho Man Tin, Hung Hom, the Hong Kong Convention and Exhibition Centre, and Admiralty. It is a territory-wide strategic railway project (alignment layout at **Annex 1**).

4. The SCL project is implemented under the “concession approach” and funded by the Government. The MTR Corporation Limited (“MTRCL”) was entrusted by the government to carry out the construction. The Entrustment Agreement of SCL main works was signed between the Government and the MTRCL to entrust the construction, testing and commissioning of the SCL project.

According to the Entrustment Agreement, the MTRCL warrants that the Entrustment Activities shall be carried out with the skill and care reasonably to be expected of a professional, including the assurance of quality of works up to the standard requires.

5. The Highways Department (“HyD”) has been closely monitoring the work of the MTRCL, through a Project Supervision Committee (“PSC”) led by the Director of Highways (“DHy”), which holds monthly meetings with Projects Director of the MTRCL, to review the progress of the SCL project and monitor the procurement activities, post-tender cost control and resolution of contractual claims. MTRCL submits monthly progress reports to the HyD to report the latest progress and financial position of the SCL project. Moreover, an officer at Assistant Director level and the two Chief Engineers from HyD hold monthly Project Coordination Meetings and Project Progress Meetings with MTRCL respectively to monitor different aspects of the implementation of the project and the progress, the handling of issues in relation to design, construction and environmental fronts that may have potential impact to the progress and programme of the SCL project, as well as the handling of interfacing issues with other projects. The HyD has also appointed a M&V consultant to assist in the monitoring work and undertake regular audits, advise the HyD of any potential risk of delay and also offer comment to the HyD on the appropriateness of MTRCL’s proposed delay recovery measures. The DHy meets with the Secretary for Transport and Housing (“STH”) on a monthly basis and submits reports to report the progress of the project. Where necessary, he also reports to the STH any significant issue relating to the implementation of the project.

6. Since the end of May 2018, there have been media reports of problems with the construction of the SCL, including the reported incident at Hung Hom Station platform where the reinforcement were cut, part of the concrete wall of the To Kwa Wan Station was not constructed according to the drawings, the excavation works of the Exhibition Centre Station (EXC) station exceeded the allowable depth, and the reinforcement cage of two consecutive sections of diaphragm wall panels installed in wrong direction. The Government has always attached great importance to the safety and quality of the project. The Government has immediately followed up with the MTRCL after receiving the above media reports and requested the MTRCL to submit reports or information on the incidents and the remedial measures. MTRCL’s failure to report to the Government on the first three construction incidents that occurred at the Hung Hom Station, To Kwa Wan Station and the MTR station is totally unacceptable to

the Government.

7. The reported incident about the cutting of reinforcement at the SCL Hung Hom Station has caused widespread concern in the society. As the incident is related to public safety, the Government attaches great importance to it. On 12 June 2018, the Chief Executive decided to set up an investigation committee to conduct an independent and comprehensive investigation under the Commissions of Inquiry Ordinance (Chapter 86), with Judge Michael John Hartmann serving as the chairman of the investigation committee. The investigation committee will be given all necessary legal power to conduct independent and comprehensive investigations and recommendations on the incident to relieve public concerns..

8. On 15 June 2018, the MTRCL reported to the HyD on the incident regarding reinforcement cutting at the platform of the Hung Hom Station. The report became available to the public on the same day. The report states that the statements given by one of the sub-contractors of Leighton Contractors (Asia) Limited (“Leighton”) are not consistent with those given to the MTRCL by Leighton, who has strenuously denied the allegations. The MTRCL did not express any opinion on this matter. According to the information provided by the MTRCL separately to the HyD, the HyD considers that the matter may involve criminality and the HyD has therefore referred the matter to the Police for follow-up action. In order to avoid obstructing the police criminal investigation and the work of the investigation committee mentioned in paragraph 7 above, it is not appropriate at this stage to discuss the incident in this subcommittee.

9. The ensuing paragraphs will focus on discussion of the incidents at the To Kwa Wan Station and the Exhibition Centre Station. The MTRCL’s statement on the above incidents is set out in **Annex 2**.

Internal Wall Construction at To Kwa Wan Station

Immediate follow-up actions by Government after learning the incident

10. To Kwa Wan Station is an underground station of the Tai Wai to Hung Hom Section of the SCL project located at Ma Tau Wai Road. The structure of the station is built from the top to the bottom. To Kwa Wan Station is part of the works under the “SCL Contract No. 1109 – Sung Wong Toi and To Kwa Wan Stations and Tunnels”. The Contractor is Samsung – Hsin Chong Joint Venture.

The works commenced in July 2012.

11. After knowing the incident alleging the removal of steel reinforcement from the concrete wall on 5 June 2018, the Transport and Housing Bureau (“THB”) and HyD requested the MTRCL to provide detailed information. According to the written reply from the MTRCL to the HyD on 8 June 2018, the Contractor did not carry out part of the works for the reinforced concrete wall adjacent to the staircases at the To Kwa Wan Station platform in accordance with the construction drawings. However, the MTRCL’s reply did not contain information such as the extent of the wall in question, the cause of the incident, circumstances pertaining to the supervision of works and the impact on the structure.

12. HyD wrote to the MTRCL on 11 June 2018 again expressing dissatisfaction that the incident had not been reported to the HyD on a timely basis. HyD, being disappointed, considered it unacceptable that the MTRCL could not identify the relevant problem during its supervision of the works. HyD required the MTRCL to submit a report on or before 18 June 2018 with detailed explanation of the cause of the incident and rectification plan. HyD received the report from the MTRCL on 19 June 2018, and noted that the MTRCL subsequently revealed the report to the public on the same date. An executive summary of the report is attached in **Annex 3**.

Details of the incident

13. According to the report submitted by MTRCL on 19 June 2018, the Contractor confirmed in writing that the 200mm thick internal wall adjacent to the staircases ST-03 and ST-04 at the To Kwa Wan Station platform was not main structure and part of it was not constructed according to the drawings. Due to bulging of the formwork during the pouring of the concrete, the thickness of the concrete wall had exceeded the requirements. When the Contractor surveyed the internal walls next to the staircases ST-03 and ST-04 in August and September 2017 respectively, it found out that the thickness of the wall was uneven and repair works was required. From February to April 2018, the Contractor trimmed the excessive concrete in accordance with the approved general concrete repair method statement to make the wall in compliance with the design thickness. However, during the removal, flattening and patching of the thickened concrete wall, the Contractor removed the reinforcement in localized areas of the internal wall, but the approved method statement does not allow the removal of the

reinforcement. After exposure of the incident, the Contractor expressed that, among the approximately 320 square meters of concrete internal wall that had been trimmed, there might be non-compliance with the approved plan at three locations, with a total area of approximately 60 square meters (including about 18 square meters on ST-03, and two locations about 8 square meters and 33 square meters on ST04). The meter is in ST-04). According to the existing information of the Contractor, there is no evidence that reinforcement has been removed from an adjacent parapet wall.

14. The MTRCL's report stated that the Contractor had reviewed the internal wall design and confirmed that partial removal of reinforcement did not affect its structural safety. The MTRCL also pointed out that, after their preliminary checking, the condition of the wall would not pose any safety risk to the internal walls and adjacent staircases and escalators.

15. The HyD has reviewed the report submitted by the MTRCL in detail. Although the report generally covers the relevant information on the incident at To Kwa Wan Station, the MTRCL still needs to further explain some details in the report. The HyD has written to the MTR Corporation on 27 June 2018 to provide more detailed information, to find out the shortcomings and to prevent the recurrence of the similar incident.

Remedial proposal

16. The Contractor conducted non-destructive test at three locations where the works did not comply with drawings to confirm the extent to which the reinforcement within the concrete wall had been removed. The test results can indicate whether there is reinforcement in the concrete, the size of reinforcement and the cover to the reinforcement, etc. To further ensure that the works complies with the quality requirements, the MTRCL requested the Contractor to open up the two walls concerned for inspection.

17. The Contractor has provided the MTRCL with preliminary reinforcement remedial proposals, including thickening the wall or reinstalling the reinforcement at the locations where they were removed. The MTRCL is considering the preliminary reinforcement remedial proposals proposed by the contractor. After confirming the extent to which the reinforcement has been removed, the MTRCL will submit a final remedial proposal to the HyD. The MTRCL also stated that

they would closely monitor all the reinforcement remedial works carried out by the Contractor. Upon receipt of the MTRCL's remedial proposal, the HyD will vet the final proposal as soon as possible and provide advice as necessary to ensure that the repair works can be completed promptly.

Problems arising from the incident

18. The incident report submitted by the MTRCL revealed that, during the trimming for concrete repair, the MTRCL failed to identify early that the contractor had amended the engineering design that had not been approved. There is a loophole in the works supervision system, which elaborates as follows.

19. The report submitted by the MTRCL stated that, in general, it was not required to establish a "Hold Point" in the approval of the method statement for concrete repair. There was no need for the Contractor to obtain the consent of the MTRCL for proceeding with the repair works. The MTRCL was thus unable to determine whether the contractor had carried out the repair works in accordance with the requirements of the method statement.

20. The MTRCL's report stated that site supervisors should conduct inspections before and after the concrete repair. However, since the Contractor can carry out the concrete repair process without obtaining the consent of the MTRCL, the MTRCL cannot guarantee that the site supervisors can inspect the works beforehand. There is a possibility that works supervision might be ineffective and thus the quality of concrete repair work cannot be assured.

21. Furthermore, during the process of concrete trimming, the Contractor did not formulate a specific method statement for trimming the concrete walls near the staircases ST-03 and ST-04, which involves reinforcement removal. Instead, the Contractor adopted the general concrete repair method statement which does not allow reinforcement removal. The MTRCL also did not request the Contractor to submit a concrete repair scheme for this situation.

22. The report indicated that the MTRCL had noticed a resident site supervisor had noticed that the horizontal reinforcement at individual locations beside the staircase ST-03 had been removed, but they took no action against the Contractor or reporting the case to their supervisor. The MTRCL indicated that it would commence disciplinary proceedings against their officers who violate

internal procedures and guidelines.

Excavation Works at Exhibition Centre Station

Immediate follow-up actions by Government after learning the incident

23. Exhibition Centre Station is an underground railway station located in Wan Chai North under Hung Hom to Admiralty Section of the SCL project. The railway station structure was constructed under Contract 1123 - Exhibition Centre Station and Western Approach Tunnel. The Contractor was Leighton - China State Joint Venture. The works commenced in January 2015.

24. The Contractor adopted the cut-and-cover method to construct Exhibition Centre Station. To prevent the adverse effect on the adjacent building, road and underground utilities, the Contractor was required to construct diaphragm walls or pipe pile walls at the sides of the railway station first. During the course of excavation for railway station, the temporary supporting lateral struts were required to be installed at the specific depths. The size, erection and installation depth of temporary supporting lateral struts were designed by the professional engineer in order to meet the safety requirements. Therefore, the Contractor was required to strictly follow the designed works sequence to carry out the excavation works.

25. The THB and the HyD took immediate follow-up actions after being informed on 17 June 2018 (Sunday) of the incident that the excavation works at Exhibition Centre Station might exceed the allowable depth during the excavation works. Since the HyD had not been received prior notification from the MTRCL, it requested the MTRCL to provide the detailed account of incident in writing within 48 hours.

26. The HyD received the written information submitted by the MTRCL in the evening of 19 June 2018. The information revealed that the HyD was deeply dismayed by the fact that the Contractor had carried out excavation beyond the allowable depth before the installation of the final layer of temporary lateral struts, and the MTRCL had allowed the situation to continue for more than one month. This incident may pose serious safety risks to the public. In addition, the THB and the HyD also deeply regretted that the attitude of the MTRCL, as a project manager, had not tried its best to urge the Contractor to carry out the excavation in accordance with the design.

Details of the incident

27. With reference to MTRCL's written information submitted to the HyD on 19 June 2018, the incident on the excavation works at Exhibition Centre Station happened at the site of Former Wan Chai North Public Transport Interchange. The excavation for the railway station commenced in August 2017 and the excavation depth was about 26.7m (i.e. -22.7mPD). The excavation works were mainly divided into five stages. Each stage of excavation works would be temporarily stopped at about 1m below the proposed temporary lateral strut level. After completing the temporary lateral strut installation at that level, the excavation works could then proceed to the next stage.

28. The allowable excavation depth was 23.5m (i.e. -19.5mPD) prior to the completion of installing the fifth strut layer by the Contractor. However, the Contractor had commenced the on-site excavation works when the MTRCL found the excavation works at the site that the necessary lateral support of the fifth strut layer was not installed. The MTRCL then issued the Non-Conformance Reports ("NCR") to the Contractor respectively on the following dates in accordance with the MTRCL's Project Integrated Management System.

- (a) According to the NCR issued by the MTRCL on 10 May 2018, the excavation depth at the site of Former Wan Chai North Public Transport Interchange (Gridline 12 to 13) was up to 25m (i.e. -21mPD) with the exceedance of the allowable excavation depth by 1.5m; and
- (b) According to the NCR issued by the MTRCL on 11 June 2018, the adjacent excavation works at the same site (Gridline 13 to 16) had reached 26m in depth (i.e. -22mPD) with the exceedance of the allowable excavation depth by 2.5m. MTRCL had further supplemented that the excavation depth at some localized locations was up to 3.2m.

29. From those two NCRs, the MTRCL pointed out that the relevant works procedure did not meet the construction method approved by the MTRCL and had requested the contractor to submit a remedial action plan and review the stability of Excavation and Lateral Support for the approval of MTRCL's Project Engineer. While the MTRCL and the Contractor were discussing the remedial proposal, both parties continued to monitor the continuous wall and the nearby ground. The Contractor finally submitted a remedial proposal to MTRCL on 19 June 2018 and examined the stability of excavation and lateral support. The Independent Monitoring Consultant of MTRCL had also examined the situation and considered that the current situation was stable and safe.

30. MTRCL stated that the whole excavation process had been monitored by monitoring instruments in order to ensure the integrity and safety of the overall structure. The monitoring includes the inclinometers of diaphragm wall, the pressure gauges of Excavation and Lateral Support, settlement monitoring points and diaphragm wall inspection works. The Registered Geotechnical Engineers (“RGE”) employed by MTRCL will conduct inspections once every two weeks in accordance with the Site Supervision Plan. During the professional assessment conducted by RGE on 18 June 2018, the diaphragm wall was stable and the excavation works were also safe since May 2018.

31. Regarding the information that the HyD received from the MTRCL on 19 June 2018, there were still many questions left unanswered. On 20 June 2018, the HyD demanded MTRCL to provide a full and detailed account of the incident, including a comprehensive review of MTRCL's implementation of the supervision system.

Remedial proposal

32. The information provided by MTRCL mentioned that the Contractor had completed at the site the soil backfilling up to the allowable depth for further excavation, and expected that the installation of the temporary lateral struts would be completed by August 2018 for carrying out further excavation works.

Problems arising from the incident

33. MTRCL's submitted report revealed that the Contractor did not follow the approved construction method during the excavation works. MTRCL failed to stop the non-compliance action by the Contractor and did not promptly report to the HyD, which had reflected that there were shortcomings on the implementation of the site supervision system and the communication mechanism, which elaborates as follows.

34. According to the information submitted by the MTRCL, the excavation works between the gridline 12 and the gridline 13, before the installation of last layer of temporary lateral strut, had exceeded the allowable depth. However, MTRCL had failed to stop or prevent this from happening before the incident. In addition, although MTRCL had issued the NCR on this incident to the Contractor, the Contractor had failed to pay attention to MTRCL's request for the remedial measures and had continued to proceed with the excavation works. MTRCL had allowed the situation to continue for a long time and failed to resolve the problem in a timely manner. Also, it could not be seen that MTRCL had implemented the appropriate management measures against the Contractor, posing serious safety

risks to the workers and the public. In addition, it showed that the NCR issued by MTRCL to the Contractor had failed to achieve the expected results, which had led to the recurrence of this incident.

35. The RGE employed by the MTRCL had carried out the regular site inspection. The information indicated that this RGE had not timely taken appropriate action to prevent the incident from getting worse.

36. The MTRCL had not informed the HyD of the above incidents. The construction problems under the MTRCL arising from the railway platforms at Hung Hom Station, the concrete wall of To Kwa Wan Station and the temporary support works of Exhibition Centre Station had not been promptly reported to the HyD. The Government indicated that this was totally unacceptable. The supplementary information submitted by the MTRCL to HyD on 27 June 2018 also indicated that if the matter was timely reported by the MTRCL internally, the MTRCL could definitely take appropriate action to stop the excavation works beyond the allowable depth by the Contractor and inform the HyD accordingly.

Construction of Western Approach Tunnel Diaphragm Wall at Exhibition Centre Station

Details of incident

37. Western Approach Tunnel is an underground railway tunnel located in Wan Chai North under Hung Hom to Admiralty Section of the SCL project. The railway tunnel structure was also constructed under MTRCL's Contract 1123. Similar to Exhibition Centre Station, cut and cover method was adopted for the Western Approach Tunnel. The Contractor constructed the diaphragm walls at the sides of the railway tunnel. In the course of excavation for the railway tunnel, the installation of temporary lateral struts is required for supporting the adjacent soil. Recently, there have been media reports about the problem associated with the construction of diaphragm wall at the Exhibition Centre Station. After verification, MTRCL considered that the media report should be related to an incident that was occurred in 2016.

38. In July 2016, the HyD received a report from the MTRCL which revealed incorrect placing of steel reinforcement in the diaphragm walls at Western Approach Tunnel after the completion of concreting works.

39. The MTRCL explained that it was the Contractor's design consultant who prepared the design drawings of the diaphragm walls, and it was the sub-contractor who prepared the shop drawings based on the design drawings. However, the sub-contractor misunderstood the design drawings and showed

wrong orientation of steel reinforcement bars in the shop drawings, which were subsequently submitted to the MTRCL after the checking by the Contractor. In the checking process, the error was not spotted by the MTRCL. The construction of the two diaphragm wall panels was carried out in accordance with the incorrect shop drawings resulting in misplacement of steel reinforcement bars. This error was subsequently discovered during the installation of diaphragm wall panels.

Remedial proposal

40. After the misplacement of reinforcement inside the diaphragm walls was discovered, the MTRCL revised the diaphragm wall design by adding concrete buttress wall to share the original design load. Having due regard to structural safety, the amendment proposed by the MTRCL was considered acceptable to the HyD. The Contractor had also carried out the works in accordance with the amendment. At that time, the HyD had urged the MTRCL to strengthen the management and supervision system of the project in order to avoid the recurrence of similar incidents.

Problems arising from the incident

41. The accuracy of shop drawings is very important. MTRCL should add a “Hold point” before approving the sub-contractor to prepare the working drawings. However, as no error was spotted during MTRCL’s checking of shop drawings prepared by the subcontractor, we considered that the MTRCL should check the procedures of construction works based on the design drawings but not only the shop drawings. In addition, there was clearly room for improvement to the implementation of the site supervision system.

Follow-up Actions by Government

42. The Government has always attached great importance to the safety and quality of the project. Immediately after knowing the above incidents, we have immediately followed up with the MTRCL and requested them to submit reports or information on the incidents and remedial measures.

43. After receiving reports and information from the MTRCL on the incidents at To Kwa Wan Station and Exhibition Centre Station, the Government has reviewed the reports in details and initially revealed the problems in the MTRCL’s works supervision. They included some of the works were not constructed

according to the drawing despite under the supervision of the MTRCL. Some contractors ignored the NCR issued by the MTRCL and continued with the works. The construction problems at To Kwa Wan Station and the Exhibition Centre Station have not been reported to the HyD in a timely manner. The management of the MTRCL has not been informed of the incident as well. It is obvious that the MTRCL's reporting mechanism, both internal reporting and the reporting to Government, is in urgent need of improvement.

44. The DHy met with the MTRCL Project Director on 22 June 2018, pointing out that the Government has gathered from the incidents the problems on MTRCL's works supervision and reporting mechanism. On the same day, the DHy requested in writing a review of the implementation of the MTRCL project management system and communication mechanisms for both internal reporting and the reporting to the Government.

45. Furthermore, to understand the details of the incidents directly from the front line staff and the challenges met during the works supervision, DHy visited the site at To Kwa Wan Station and Exhibition Centre Station on 23 June 2018. The HyD subsequently wrote to MTRCL pointing out the findings during the site inspection, and requested MTRCL to follow up.

46. The HyD has been closely monitoring the MTRCL's project management work through the three-tier structure described in paragraph 5 above and with the assistance of the monitoring and verification consultant. The role of this monitoring and verification is based on the "check the checker" approach, which is to verify that the MTRCL has implemented the relevant procedures as specified. Specifically, there are sampling checks, based on risk assessment, to ensure whether MTRCL has implemented the project in compliance with the project programme and approved budget.

47. After reviewing the existing supervision work, the HyD considered that there was room for improvement to the relevant measures. HyD has requested the MTRCL to set up a standing item in the monthly "Project Supervision Committee" and the "Project Coordination Meeting" and report on the issues related to the reporting mechanism and the site supervision of works, in order to enhance the monitoring of the MTRCL's site supervision of works. For example, the MTR Corporation is required to report to the HyD at the meeting data related to the NCR issued by the MTRCL to the Contractors, and report any improving or deteriorating trend in the quality of the works such that appropriate measures can

be taken. The HyD will also step up the verification to ensure MTRCL has implemented the relevant procedures.

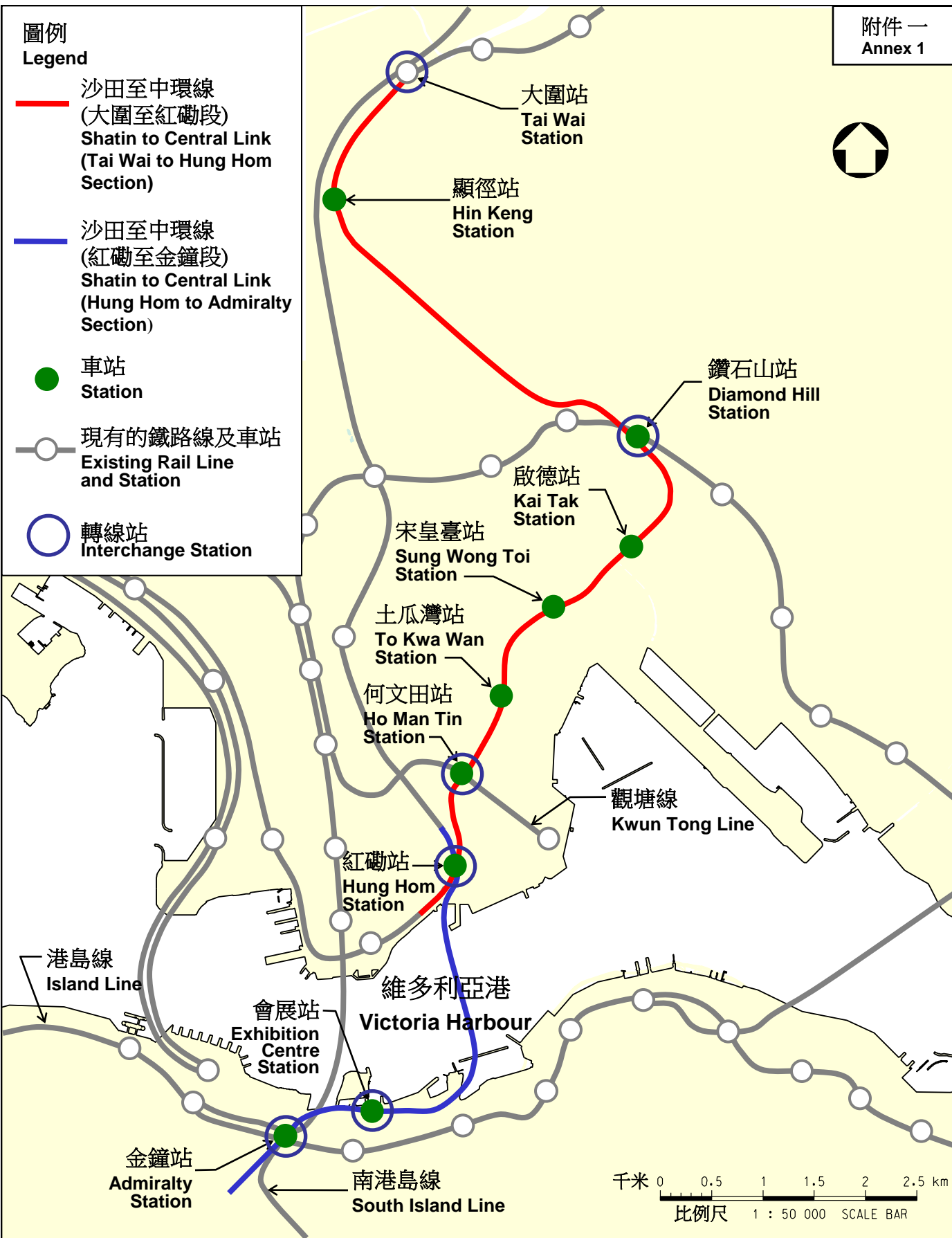
48. As the project manager of the SCL project, the MTRCL must strictly abide by its responsibilities under the Entrustment Agreement to ensure the quality of the SCL project. We are deeply concerned about the supervision problems revealed in the report. In particular, the site supervision staff did not take any action against the contractor after noticing the non-compliance, nor reporting the non-compliance to his supervisor on the site. The incidents revealed that there were problems with the MTR's internal reporting system, resulting in the non-compliance not rectified immediately, and also prevented the MTRCL from report the case to the HyD as soon as possible.

49. To improve a series of problems occurred in SCL, we noticed that the MTR Board of Directors special meeting held on 21 June 2018 requested its Capital Works Committee to conduct a review of the process and procedures for SCL, and to be completed in three months with the assistance of consultant. The MTRCL also stressed that the Board of Directors is very concerned about the incidents in the SCL project, and the safety and works quality have always been the top priority. The Government expects that the review will improve the MTRCL project management system and its implementation to ensure the safety and quality of the construction of the SCL project.

**Transport and Housing Bureau
Highways Department
July 2018**

圖例
Legend

- 沙田至中環線
(大圍至紅磡段)
Shatin to Central Link
(Tai Wai to Hung Hom Section)
- 沙田至中環線
(紅磡至金鐘段)
Shatin to Central Link
(Hung Hom to Admiralty Section)
- 車站
Station
- 現有的鐵路線及車站
Existing Rail Line and Station
- 轉線站
Interchange Station



圖則名稱 drawing title

沙田至中環線的走線

Alignment of the Shatin to Central Link

圖號 drawing no.

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鐵路拓展處 Railways Development Centre



路政署

Highways Department

**Legislative Council Panel on Transport
Subcommittee on Matters Relating to Railways**

**Issues relating to construction works at To Kwa Wan Station and
Exhibition Centre Station under the Shatin to Central Link project**

This paper provides information to Subcommittee members in relation to recent concerns relating to the construction works at To Kwa Wan Station (“TKW”) and Exhibition Centre Station (“EXC”) under the Shatin to Central Link (“SCL”) project.

2. We also set out in this paper information relating to the Corporation’s project management systems and procedures which provide the basis for us to handle various challenges in SCL and other projects.

3. In certain works performed in TKW and EXC, as highlighted in paragraphs 15 to 17, the Corporation should have reported non-conformance on a more timely basis both within the Corporation and to relevant Government departments. We regret these reporting lapses and as noted in paragraph 16, the Board of the Corporation has tasked the Corporation’s Capital Works Committee as well as directed management to review the processes and procedures including reporting mechanism within our project management system.

Background

4. SCL is an important strategic project which will significantly improve the connectivity of the existing railway system in Hong Kong. SCL consists of two sections -

(i) Tai Wai to Hung Hom Section :

Extending the existing Ma On Shan Line from Tai Wai to Hung Hom via Hin Keng Station, Diamond Hill Station, Kai Tak Station, Sung Wong Toi Station, To Kwa Wan Station and Ho Man Tin Station, linking up with West Rail Line; and

(ii) Hung Hom to Admiralty Section :

Extending the existing East Rail Line to Exhibition Centre Station in Wan Chai North and Admiralty Station through Hung Hom.

Project management systems and procedures

Project Integrated Management System (“PIMS”)

5. The Corporation’s project management systems and procedures are set out in PIMS and Procurement & Contracts Procedures documents. PIMS has been in use for over 20 years. It is certified to be in compliance with the ISO 9001 quality management standard and is updated and improved under the oversight of a dedicated steering group within the Corporation which meets on a regular basis.

6. PIMS covers project delivery areas including programme management, design management, construction management, safety management, environmental management, cost management, procurement, contract administration and reporting.

Role of Project Manager

7. Construction works are undertaken by individual contractors and they have the primary responsibility of delivering the works in accordance with the terms of contract and relevant statutory requirements. The Corporation, as the Project Manager under the Entrustment Agreement of the SCL project, is responsible for supervising and monitoring of the work of the contractors to ensure compliance. To achieve this, PIMS has outlined an inspection regime for construction teams to follow.

Supervisory framework

8. In accordance with relevant statutory requirements, the Corporation submitted a Project Management Plan for SCL to Buildings Department and Highways Department, in which the Corporation stated that PIMS would be applied to the design and construction of the SCL project.

9. Apart from statutory requirements, there are detailed provisions in the Corporation's contract to govern safety and ensure the quality of the works. In accordance with the contract documents, which include drawings, the General Specification for Civil Engineering Works and the

Particular Specification for works contracts, contractors are generally required to prepare and submit a Method Statement and associated Inspection and Test Plan prior to commencing construction works. The Corporation will review and assess these submissions. The contract mandates the method of Hold Points that is based on the quality control approach used in the United Kingdom and is widely adopted in the civil construction industry in Hong Kong.

“Hold point” inspections

10. The hold point process is a critical step during construction that requires an inspection and approval or permit be given prior to moving on to the next steps in the construction process. This mechanism is embedded within SCL contracts, with a number of “hold points” in each construction activity, i.e. points at which a notice of permission, consent or no objection is required before proceeding to the next activity.

11. At the hold points, once the contractor has inspected and is satisfied that the relevant works have been completed in accordance with the specifications, the drawings and quality supervision plan, the contractor would sign and submit a “Request for Inspection and Survey Checks” form to the Corporation. The Corporation would then perform its own inspections, which would be signed off by its inspector and/or engineer as appropriate.

Regular inspections

12. Given the scale and complexity of the construction, checking and inspection is not done just at the hold points, but on a daily basis by on-

site staff even before reaching a particular hold point. As in all large-scale infrastructure and construction projects, it is not uncommon that site inspectors and engineers would detect irregularities during regular monitoring and inspections. For these irregularities, construction teams would request the relevant contractor to carry out rectification and improvement works immediately. These daily supervision and checking works are very important to give assurance before reaching the hold points.

Non-conformance Reports (“NCRs”)

13. In case of non-compliance with the specification or the drawings by the contractors, the Corporation may issue an NCR to the contractor. The contractor concerned shall then propose corrective measures to rectify the works. The Corporation’s construction team shall oversee the remedial works to ensure that they are completed safely and in accordance with the agreed remedial proposal. Where amendments to the original design are involved, the remedial proposals concerned will be submitted to relevant Government departments for review and agreement.

14. NCRs are a common and necessary management measure in the project management process during the course of construction, to record and demand rectification of non-conformance. NCRs are widely adopted in all construction projects, and the number of NCRs issued under each construction contract may vary due to the nature and scale of works, geology, complexity of the project, performance of the contractors, etc.

Issues relating to construction works at TKW and EXC

15. The Corporation fully understands the public's concern on the quality of the construction works and the effectiveness of the project management system. We will continue to maintain a high level of transparency on railway projects. Details on the construction of the internal wall at TKW Station, the temporary steel strutting for excavation and construction of diaphragm wall at EXC Station are at **Enclosures I, II and III** respectively.

16. The Corporation has successfully delivered many railway projects which are now providing efficient and safe services to the Hong Kong public every day. This has been achieved on the basis of the Corporation's well tested project management system with the concerted efforts of all MTR colleagues. Nevertheless, in light of the recent incidents, including some in which the Corporation should have performed better in site supervision and/or the provision of timely notification to Government on certain non-conforming works, we are conscious of the need for improvement. We regret any lapses in such procedures which resulted in the public's concern. To provide assurance and confidence to the public, the Capital Works Committee under the MTR Board of Directors will conduct a review of the processes and procedures for SCL within PIMS to seek further improvement. The scope of the review includes the processes and procedures for the detection, recording and reporting (both internally and externally) of non-compliant works and the oversight of related remedial action.

17. Safety and quality of railway projects is the Corporation's top priority. We will continue to ensure that safety is upheld in taking forward the SCL project.

MTR Corporation Limited

July 2018

The construction of internal wall at To Kwa Wan Station

The investigation

Upon receipt of a media enquiry on 5 June 2018 about the change of the structural design of an internal wall and a parapet wall at TKW under the SCL project, the Corporation immediately made enquiries with the main Contractor, Samsung – Hsin Chong Joint Venture (“the Contractor”). On 8 June, the Contractor confirmed in writing that part of the completed works was not in accordance with the drawings. In subsequent discussions with the Contractor, the Corporation was informed that there are three locations, of limited areas, in the internal wall located adjacent to two staircases near the upper platform level in TKW, which are of concern.

2. In response to the request from the Government, the Corporation submitted the findings of its investigation to the Government on 19 June 2018. The report was also made public.

3. As stated in the Report submitted to the Government, the internal wall was constructed in accordance with the drawings, as confirmed by relevant inspection records. According to the Contractor, during the trimming of over-cast concrete to achieve a smooth surface for tiling over the internal wall, some of the reinforcement bars at three localised areas totalling 60m² were removed.

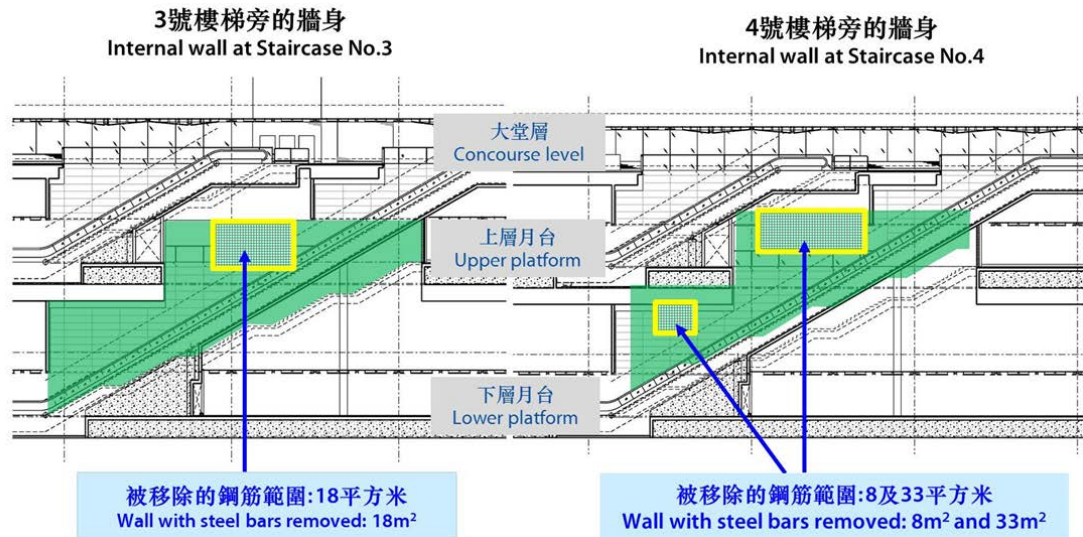


Figure 1 – Steel bars removed at three locations on an internal wall of TKW

4. As for the parapet wall, after thorough checking, there is no evidence suggesting reinforcement bars were removed.

Comprehensive check

5. The Corporation is very disappointed with the Contractor for not following the approved concrete repair method statement when undertaking the minor remedial works for the over-cast concrete, and we take such contravention very seriously. Although the Contractor has stated that it suspects that the areas of concern are limited to the areas described above, as a matter of prudence and to address public concerns, the Corporation has instructed the Contractor to open up the whole area that was previously trimmed, to ensure that either the works are in accordance with the drawings or to undertake remedial works in accordance with the approved method statement.

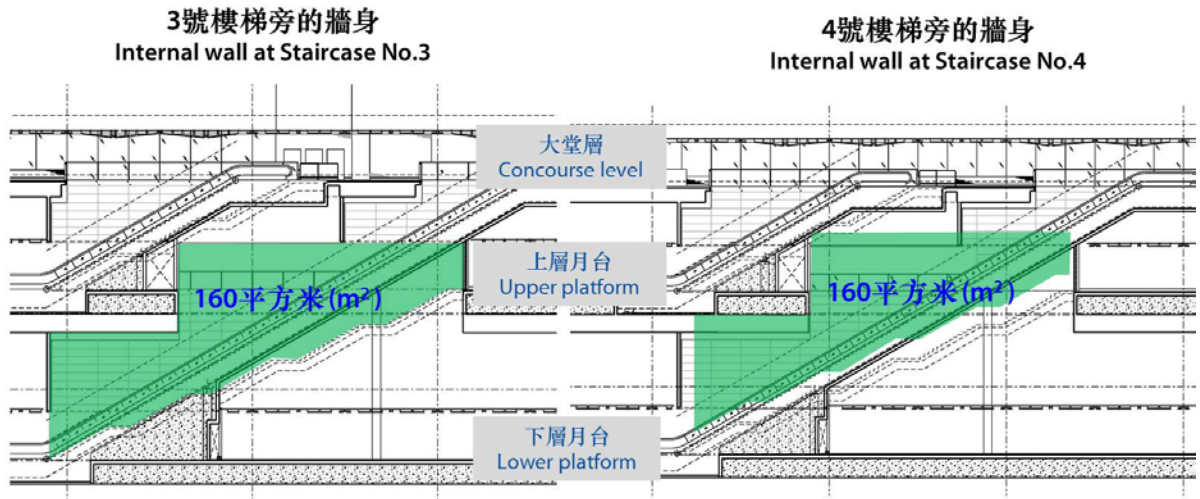


Figure 2 – Checking on all wall surfaces previously trimmed at TKW

Rectification works

6. The Contractor has submitted a proposal on the reinforcement rectification works, which involves removing the architectural finishes and opening up the concrete from the front face of the defective sections of the wall. The Contractor will carry out the rectification works once necessary consent has been obtained from the Corporation and Government. The reinforcement rectification works are expected to commence in July, which is envisaged to take around three months and expected to be completed by mid-October. The Corporation will closely supervise these reinforcement rectification works.

Conclusion

7. The Corporation is very concerned about this case of non-compliance and will handle the matter strictly in accordance with the contract. The performance of contractors will be taken into account in future tendering exercises.

8. We have conducted investigation into whether any of our staff had knowledge of the non-compliant works. We found that an MTR inspector had noticed an area with some horizontal reinforcement bars removed adjacent to one staircase but had not reported such issue. We are concerned about this omission to report and have commenced disciplinary processes. We will be conducting a review of the processes and procedures for the detection, recording and reporting/escalating of non-compliant works. Appropriate follow up action will be taken after this review.

9. Safety has always been the first priority of the Corporation and there are established processes in our project management regime to ensure safety and quality of construction works. The Contractor has confirmed, and the Corporation's initial checking concurs that based on the known information, the deviation of the completed works of the internal wall from the drawings does not create any safety impact to the internal wall and to the adjacent staircases and escalators. This case does not affect the overall structural integrity of TKW and has no impact on the overall programme of the project.

Enclosure II

Temporary steel strutting erected for excavation works at Exhibition Centre Station

The Corporation issued two NCRs relating to over excavation beyond the allowable depth at two localised areas at Exhibition Centre Station (“EXC”) before the erection of the temporary steel strutting. The NCRs were issued on 10 May and 11 June 2018. Despite the issue of the NCRs, the site condition was considered to be safe all along as checked by the Corporation and confirmed by the Registered Geotechnical Engineer (“RGE”), and that safety to the public and site workers had at no time been compromised.

2. The works concerned were carried out by Leighton - China State Joint Venture (“the Contractor”), the main contractor of SCL Contract 1123 “Exhibition Centre Station and Western Approach Tunnel”.
3. This note provides information on the details of the non-conformance case and follow up works taken.

Background

4. The works site for EXC is divided into 4 zones namely Zone 1, Zone 2, Zone 3 and Zone 4 as shown in **Figure 1**.

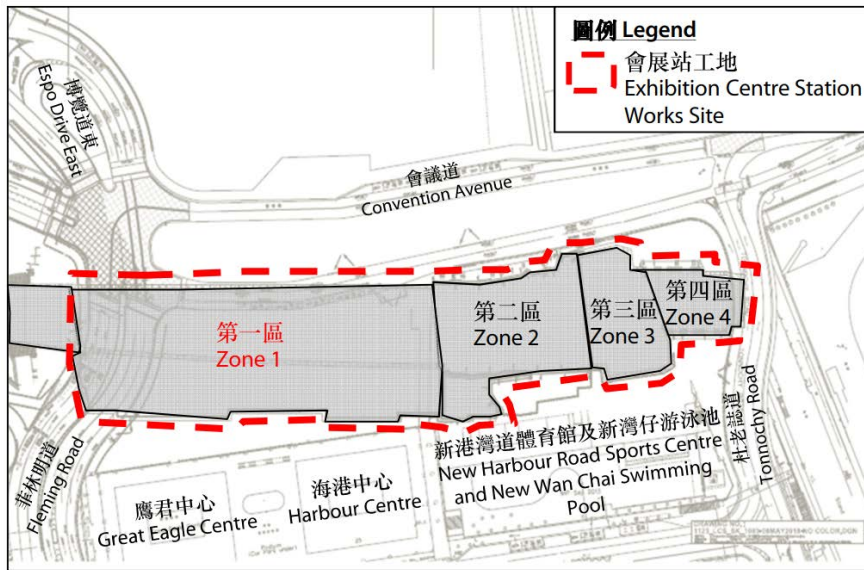


Figure 1 – Zoning layout of EXC

5. Construction sequence involving progressive excavation and Excavation Lateral Support (“ELS”) works (installation of temporary steel strutting) was accepted by relevant Government departments in June 2017 allowing bulk excavation at Zone 1 to commence in July 2017. According to this accepted construction sequence, excavation works take place in between diaphragm walls and temporary steel strutting is erected at specified intervals as the excavation goes deeper to form the ELS system to support the excavation. There are five layers of temporary steel struts in Zone 1, the approved construction sequence allowed excavation to proceed to -19.5 mPD prior to installing the 5th layer of struts, as illustrated in Figure 2 below.

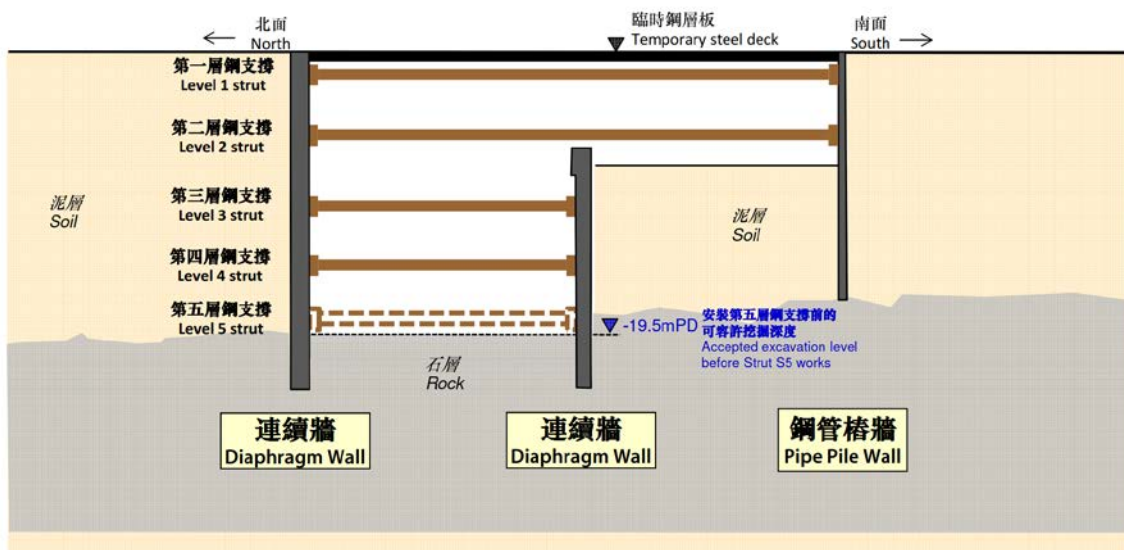


Figure 2 – Cross section of EXC – excavation and installation of temporary steel strutting

The non-conformances

6. The Contractor has been installing the temporary steel strutting in accordance with the contractual requirements from first to fourth layers. On 9 May 2018, the Corporation observed a localised over-excavation by approximately a few metres lower than the allowable depth of -19.5mPD level during rock breaking without installation of the fifth and final layer of temporary steel strut.

7. The Corporation issued to the Contractor an NCR on 10 May 2018 and discussed the appropriate remedial proposal with the Contractor on the same day, including backfilling and installing of the required strut at level 5. Backfilling and the necessary general excavation and rock breaking along the southern diaphragm wall for the level 5 strut installation were carried out afterwards. Backfilling works at this localised area had been subsequently completed and the installation of the required strut at level 5 was completed on 17 June 2018.

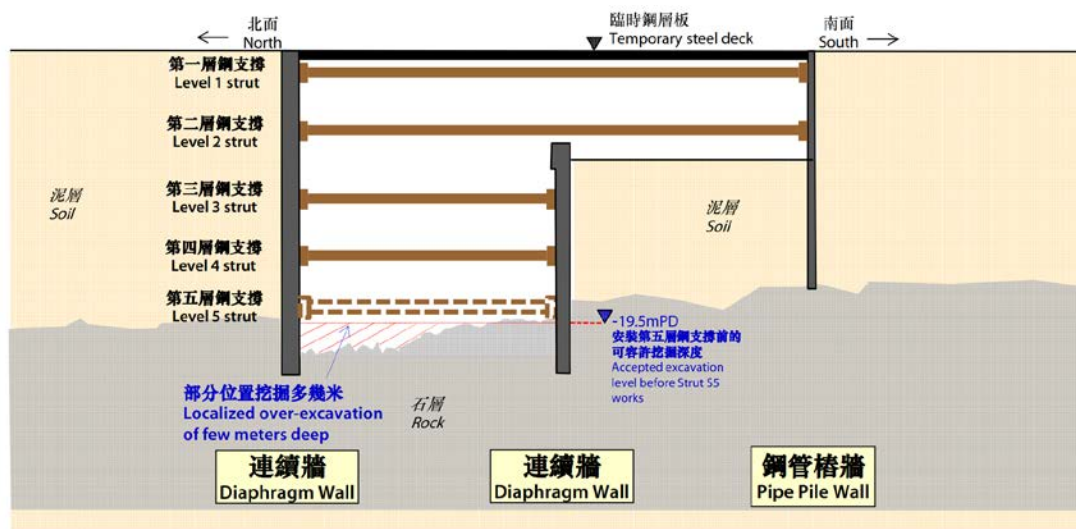


Figure 3 – The non-conformance

8. On 4 June 2018, the Corporation observed another localised over-excavation lower than the allowable depth of -19.5mPD level during the rock breaking in Zone 1. The Corporation then issued another NCR to the Contractor on 11 June 2018. Backfilling works at this localised area were completed in early July 2018 and targeted to complete the installation of the required struts at level 5 by August 2018.

Safety

9. The Corporation has a stringent geotechnical monitoring regime including diaphragm wall inclinometers, strain gauges on the temporary steel strutting, settlement markers and diaphragm wall inspections to ensure structural stability and safety. Bi-weekly inspections by the Registered Geotechnical Engineer are also carried out in accordance with the statutory Site Supervision Plan accepted by the relevant government department.

10. The Corporation and the Contractor have been carrying out Peer Group Reviews three times a week to examine the instrumentation monitoring data recorded over the preceding two days and to identify possible cause(s) of variation(s), if any. Two instrumentation monitoring engineers from the Contractor, one geotechnical engineer from the Contractor and two geotechnical engineers from the Corporation attended these meetings.

11. Following further inspection carried out by the Registered Geotechnical Engineer, he confirmed on 18 June 2018 that, from early May 2018 to that day, there was no stability concern on the diaphragm wall and the corresponding excavation works are safe.

12. The Project Management Plan contains a flow chart which clearly identifies that if a non-conformity is considered to pose imminent danger to the public and/or damage to property and/or fatal accident, the Competent Person (“CP”) and Registered Geotechnical Engineer (“RGE”) must immediately notify the relevant government departments. No notification is required unless the non-conformity poses imminent danger.

Follow-up action

13. The Corporation is very concerned that the Contractor did not follow the drawings and method statement when undertaking the excavation works, and we take such contravention very seriously. The Corporation instructed the Contractor to ask its designer to conduct a design check on the maximum excavated level without installing ELS Level 5 struts at these two localised areas. On 19 June 2018, the Contractor submitted the design check of the ELS system stability to the

Corporation. The design check confirms that the diaphragm wall and existing ELS shoring system are within their structural capacity and that they are in a stable condition. The Contractor's Independent Checking Engineer ("ICE") also certified that the design check by the Contractor's designer is satisfactory prior to issue to the Corporation. The RGE team of engineers also reviewed and certified the design check as satisfactory. The Corporation delivered the design check report, ICE certificate with RGE/CP endorsement to the relevant government department on 20 June 2018.

14. The Corporation will closely monitor the progress of the remedial works being undertaken by the Contractor, i.e., the backfilling works and the installation of the required struts at level 5. Upon being satisfied that the Contractor has duly completed the remedial works and submitted the relevant site records, the Corporation will close out the two NCRs.

Conclusion

15. Although there has been no stability or safety concerns regarding the diaphragm walls and temporary steel strutting during this period, the Corporation regrets not informing the Government of the matter at an earlier stage and not stopping the excavation works below the allowable depth, pending the Contractor's response to the NCR.

16. The Corporation will handle the non-compliance by the Contractor strictly in accordance with the contract and ensure the required rectification works will be fully implemented as soon as possible.

17. Safety has always been the Corporation's top priority. Throughout the excavation works, monitoring records and inspections confirmed that the diaphragm wall is stable and the excavation works are safe. There is no impact on the overall structural integrity of EXC and on the overall programme of the project.

**Construction of diaphragm walls
at Exhibition Centre Station and Western Approach Tunnel**

In June 2016, the Corporation identified a non-conformance case in the construction of two diaphragm wall panels, which was carried out based on incorrect reinforcement steel cage shop drawings, in the Exhibition Centre Station (“EXC”) and Western Approach Tunnel (“WAT”) works site.

2. The works concerned were carried out by Leighton - China State Joint Venture (“the Contractor”), the main contractor of SCL Contract 1123 “Exhibition Centre Station and Western Approach Tunnel”.
3. This note provides information on the details of the non-conformance case and follow up works taken.

Background

4. EXC and WAT are constructed by the cut and cover method and diaphragm walls are installed to support the excavation.
5. The works area of WAT is divided into 4 areas namely Area A, Area B, Area C and Area E, and Area C is further demarcated into Area C1 and Area C2 as shown in Figure 1.

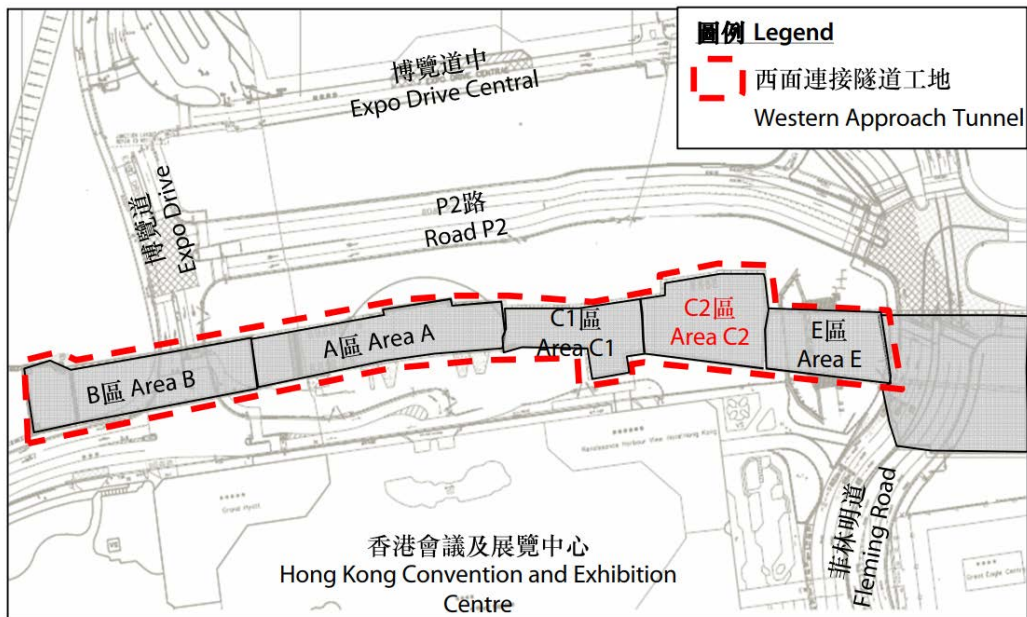


Figure 1 – Zoning layout of WAT

6. Both temporary and permanent diaphragm walls are constructed as perimeter walls for individual zones. The construction process of diaphragm wall involves trench excavation and reinforcement steel cage installation, followed by concreting.

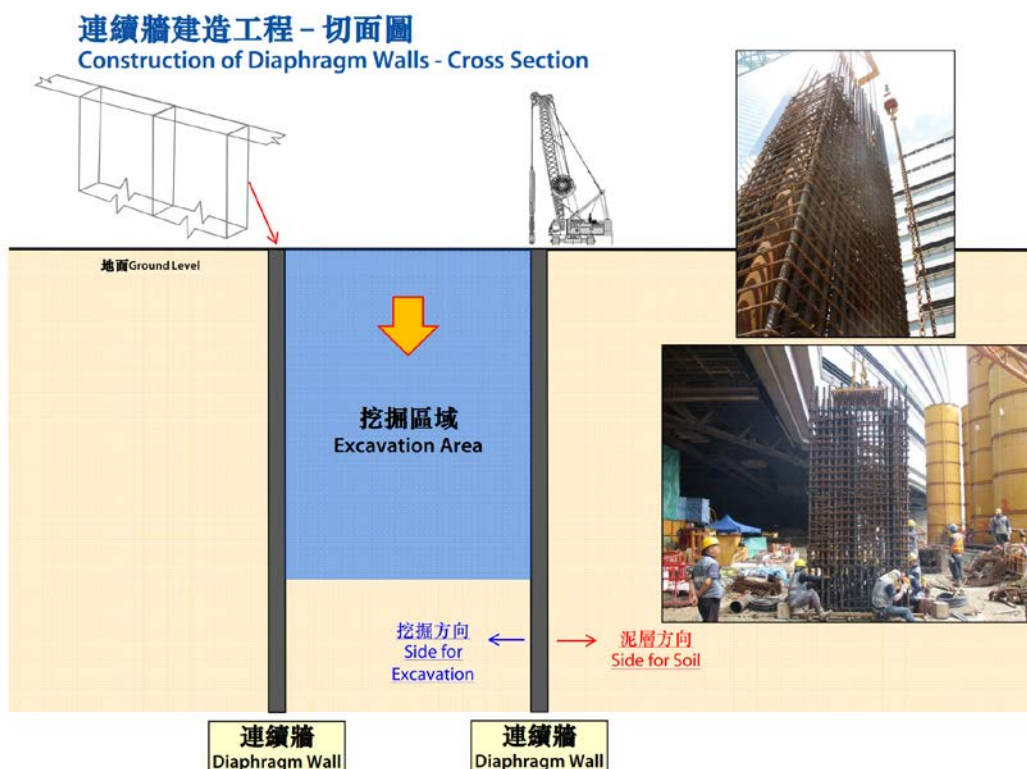


Figure 2 – Construction of Diaphragm walls – Cross Section

7. Before the start of construction, the Contractor's design consultant is responsible for the preparation of the design drawings for the diaphragm wall panels, which have to be submitted to Government for review. After the acceptance of the design drawings by relevant Government departments, the diaphragm wall subcontractor will prepare the shop drawings of the reinforcement steel cage based on the design drawings for the purpose of construction works on the site. These shop drawings were then reviewed by the Contractor before the final version was submitted to the Corporation.

The non-conformance

8. The design drawings of the works concerned were correctly prepared by the Contractor's design consultant and accepted by relevant Government departments in early 2016. Instead of the typical notation of "Excavation Face" and "Soil Face", "East/South Face", "West Face", "North/West Face", "South/East Face", etc. were used in these design drawings.

9. Shop drawings for the reinforcement steel cage for these diaphragm wall panels were then prepared by the diaphragm wall subcontractor based on the design drawings. When preparing the shop drawings for the reinforcement steel cage of two diaphragm wall panels at Area C2, the subcontractor misinterpreted the direction of the "East/South Face", "West Face", "North/West Face", "South/East Face", etc., leading to errors in the shop drawings. The layer(s) of steel reinforcement at the excavation face was wrongly placed at the soil face in the shop drawings.

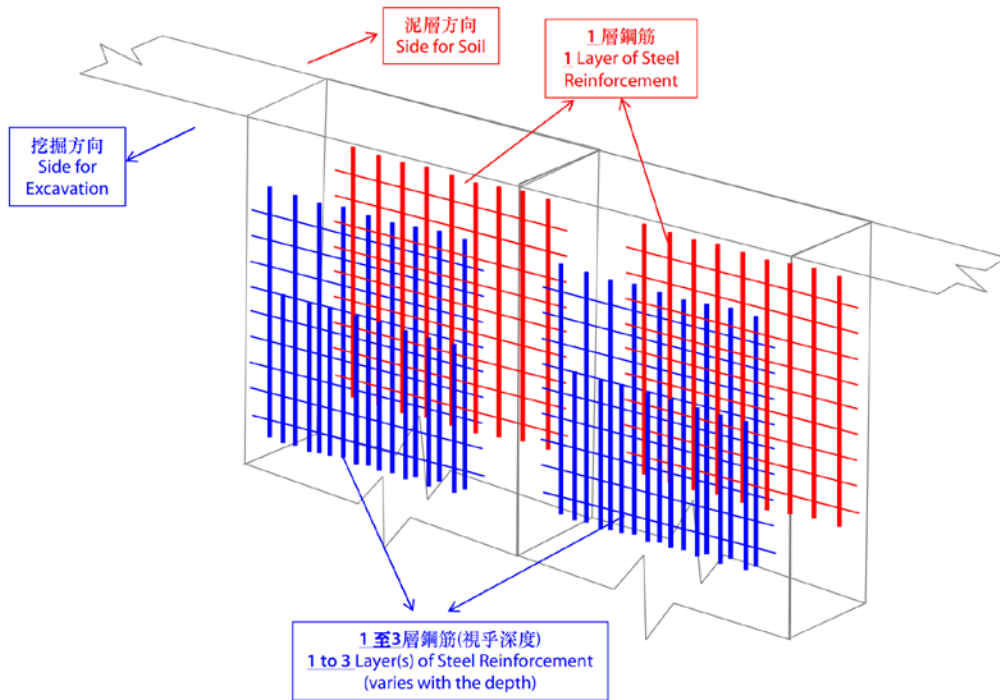


Figure 3 – Layer(s) of steel reinforcement in design drawings

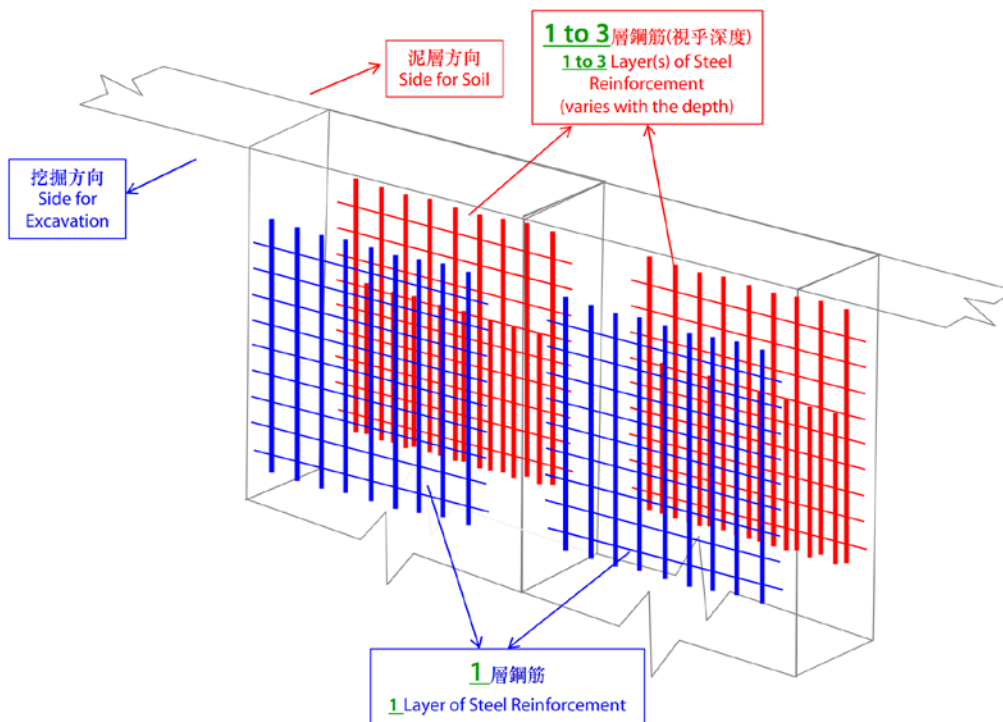


Figure 4 – Layer(s) of steel reinforcement in shop drawings

10. These shop drawings were then reviewed by the Contractor before the final version was submitted to the Corporation. These errors were not identified during this review process.

11. Subsequently, the construction of the two diaphragm wall panels concerned, which were the first two diaphragm wall panels constructed in Area C2, was carried out based on these incorrect shop drawings.

The Non-conformance Report (“NCR”) and Rectification Works

12. Before the construction of the third diaphragm wall panel in Area C2, the non-conformance was identified by the Corporation and an NCR was issued to the Contractor in June 2016 with an instruction to submit a remedial proposal.

13. After the submission of the remedial proposal by the Contractor, the Corporation’s engineers checked and discussed the non-conformance and proposal with the relevant Government departments in July 2016. The remedial proposal was then submitted to the relevant Government departments in August 2016 in accordance with the established procedure. Following further review and acceptance by the relevant Government departments in October 2016, the rectification works were completed accordingly by the Contractor under close monitoring by the Corporation’s on-site inspectorate staff.

Safety Assurance

14. Apart from the required follow-up works at the above-mentioned diaphragm wall, a review of the shop drawings of all the diaphragm wall panels previously constructed at other locations in EXC and WAT has been carried out. The review confirmed that there is no similar occurrence

in other locations. All diaphragm wall panels in the site are confirmed to be safe for subsequent excavation works.

15. The Corporation has also carried out a thorough review with the design consultant and subcontractor to improve the labelling and presentation in the design drawings to avoid any confusion and ambiguity.

Executive Summary of Internal Wall Construction at To Kwa Wan Station by MTRCL

Upon receipt of a media enquiry on 5 June 2018 regarding the construction defects at an internal wall and the adjacent parapet wall at To Kwa Wan Station (“TKW”) under construction as part of Shatin to Central Link (“SCL”) Contract 1109, MTRCL took immediate action.

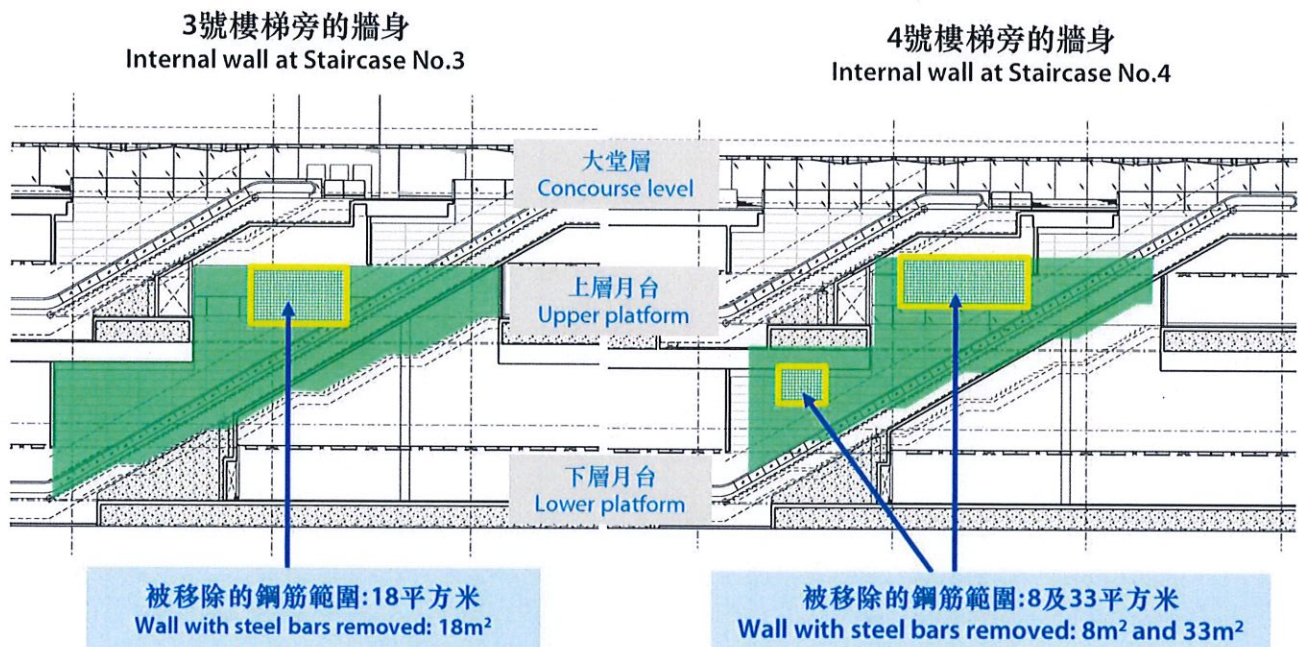
The responsibility for the construction rests with the Contract 1109 contractor Samsung Hsin Chong Joint Venture (“Contractor”) and on 7 June 2018, MTRCL met with the Contractor to investigate the issue. On 8 June 2018, the Contractor confirmed in writing that part of the completed works were not in accordance with the approved drawings. On the same day, MTRCL immediately requested from the Contractor (i) a remedial plan; and (ii) further information including as to whether there were similar issues elsewhere in Contract 1109. On 15 June 2018, the Contractor submitted a report to MTRCL which included the remedial plan as well as confirming 2 other “suspected areas” with similar deviation from approved drawings.

Concurrent with our requests for information from the Contractor, we have conducted our own investigation into this matter which included interviewing 9 members of our staff. In this investigation the Contractor has declined the requests from MTRCL to interview its staff.

The construction subject to this investigation is a completed 200mm thick internal wall located adjacent to Staircase ST-03 and ST-04 near the upper platform level (the “Internal Wall”) in TKW. Our investigation and the report by the Contractor indicate that the Internal Wall and the Parapet Wall were constructed in accordance with the approved drawings and followed the same quality control procedures as in all MTRCL projects using our Project Implementation Management System (“PIMS”), where “Hold Points” are specified and relevant forms (Request for Inspection/Survey Checks (“RISC”) Forms) were in place, inspected and signed off by both the Contractor and MTRCL engineers / inspectors as appropriate.

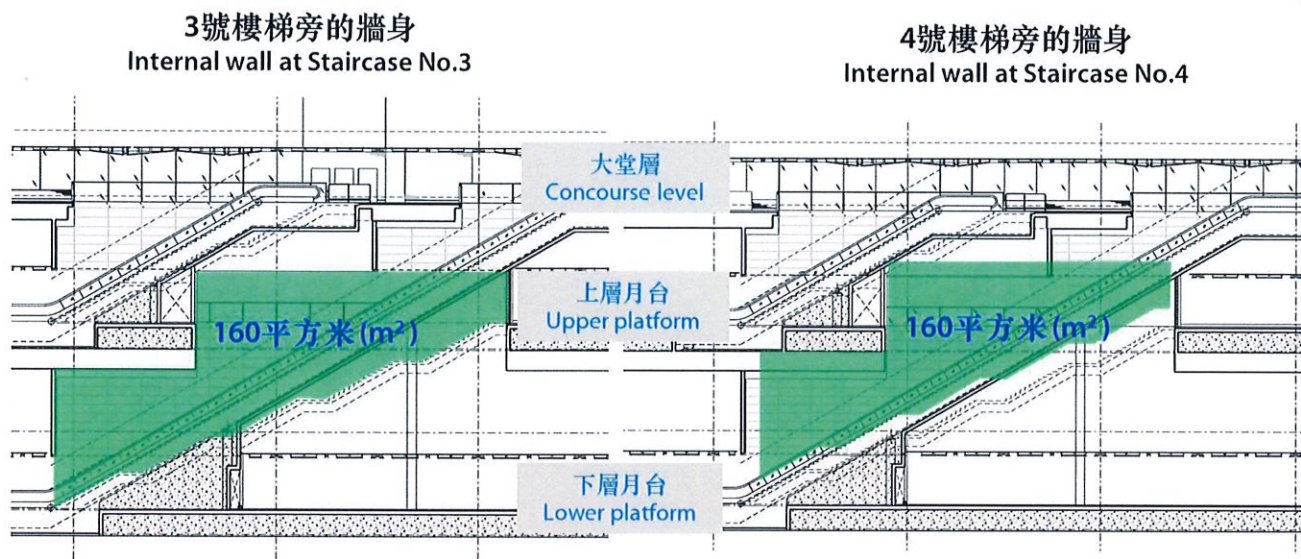
Following construction, part of the front face of the Internal Wall was found to have slightly shifted toward the public area of the station due to bulging of formwork during the concreting process, resulting in over-casting of concrete in uneven thickness at different areas of the wall surface. To remedy this bulging the process is a straight forward concrete trimming and repair for which there is a clear approved

method statement. However, during the subsequent remedial trimming of the over-cast concrete to achieve a smooth surface for tiling, some of the reinforcement bars at a localized area (which the Contractor estimates at approximately 18m²) were removed from one face of the Internal Wall. This is an unauthorised deviation from the approved method statement. The Contractor reported on 15 June 2018 that similar situations are suspected to have occurred at two other localized areas (which the Contractor estimates at approximately 8m² and 33m²) of the same Internal Wall adjacent to Staircase ST-04. It should also be noted that the average thickness of the internal wall after trimming ranges from 175mm to 180mm respectively at staircases ST-03 and ST-04.



The total area of the Internal Wall adjacent to each Staircase (i.e. ST-03 and ST-04) is approximately 350m² (i.e. 700 m² in total for both staircases) and the area of concrete trimming for each Staircase estimated by the Contractor was approximately 160 m² (i.e. 320 m² in total for both staircases). The Contractor has advised that it has carried out extensive review of the “suspected areas” requiring further investigation and has employed a specialist to conduct non-destructive testing over these areas. The Contractor’s estimate is that of the approximately 320 m² concrete trimmed area a total area of approximately 60 m² may not have been in accordance with approved drawings. Contrary to media reports, there is no evidence

suggesting reinforcement bars were removed from the 250mm thick parapet wall (the “Parapet Wall”).



The Contractor has confirmed that removal of the reinforcement bars means the works were not in accordance with the approved drawings. Such work would also not be in accordance with the approved method statement for such remedial work and the Contractor did not seek MTRCL’s approval to deviate from the approved method statement for remedial works. In our interview of MTRCL’s staff we were made aware of one instance when an MTRCL inspector had noticed, en route to checking other matters, an area with some horizontal reinforcement bars removed adjacent to staircase ST-03 but had not reported such issue. We are seriously concerned about this omission to report.

The Contractor has further confirmed, and MTRCL’s initial checking concurs that based on the known and suspected areas, the deviation of the completed works of the Internal Wall from the approved design does **NOT** create any safety impact to the Internal Wall and to the adjacent staircases and escalators.

MTRCL is very concerned with this matter and requested the Contractor to provide all relevant information relating to the matter to assist with the investigation and to submit a remedial plan for rectification of the works. MTRCL has now received the Contractor’s investigation report and remedial proposal. Although the Contractor

has stated that it suspects that the affected area is limited to the areas described above, as a matter of prudence and to address public concerns we have instructed the Contractor to open up the whole area that was previously trimmed (i.e. 320 m² in total for staircases ST-03 and ST-04) to ensure that either the works are in accordance with the approved drawings or to undertake remedial works in accordance with the approved method statement.

We will submit the remedial proposal to the Government and MTRCL will supervise all remedial works undertaken by the Contractor. We will take action against the Contractor in accordance with the Contract and also commence disciplinary processes relating to staff not complying with our processes and procedures.

-End-