

**For discussion  
on 31 August 2018**

**Legislative Council Panel on Transport  
Incident Relating to Construction of the Platform Slab of  
Hung Hom Station Extension Works  
under the Shatin to Central Link Project**

**Introduction**

This paper reports to Members on the incident relating to construction of the platform slab of Hung Hom Station (“HUH”) Extension works under the Shatin to Central Link (“SCL”) project and the follow-up actions taken by the Government.

**Background**

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

- (i) 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
- (ii) 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. The SCL has ten stations. On top of bringing improvements to the existing Tai Wai Station, the territory-wide strategic railway will also involve 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 (layout showing alignment of the SCL is at **Annex I**).

4. The HUH Extension is an underground station which is constructed under Contract Number 1112 - Hung Hom Station and Stabling Sidings of the MTR Corporation Limited (“MTRCL”). The contractor is Leighton Contractors (Asia) Limited (“Leighton”). The contract commenced in March 2013. Works under the contract mainly comprise construction of platforms and diaphragm walls for the Tai Wai to Hung Hom section and Hung Hom to Admiralty section, as well as stabling sidings.

### **Monitoring mechanism of the Government**

5. The SCL is implemented under the service concession approach in which the Government funded the construction works and MTRCL was entrusted by the Government to implement the project. The Government and MTRCL signed an Entrustment Agreement (“EA”) on the main works of the SCL, and entrusted MTRCL to carry out the construction, testing and commissioning of the SCL. According to the EA, MTRCL warrants that the entrusted works shall achieve a professional and reasonable level of skill and supervision, including the assurance of quality of the works up to the required standards.

6. The Highways Department (“HyD”) has been closely monitoring the work of MTRCL, through a Project Supervision Committee (“PSC”) led by the Director of Highways (“DHy”), which holds monthly meetings with Projects Director of 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 HyD to report the latest progress and financial position of the SCL project. Moreover, an officer at Assistant Director level and the relevant Chief Engineers from HyD convene monthly Project Coordination Meetings (“PCM”) and Project Progress Meetings (“PPM”) with MTRCL respectively to monitor various aspects and the progress of the implementation of the project, the handling of issues in relation to design, construction and environment that may have potential impact on the progress and programme of the SCL project, as well as the coordination of interfacing issues with other projects. HyD has also appointed a Monitoring and Verification (“M&V”) Consultant to assist HyD in the monitoring work and undertake regular audits, advise HyD of any potential risk of delay, and also offer comments to HyD on the appropriateness of MTRCL’s proposed

delay recovery measures. DHy meets with the Secretary for Transport and Housing (“STH”) on a monthly basis and submits reports on the progress of the project to STH. Where necessary, DHy also reports to the STH on any significant issue relating to the implementation of the project.

### **Construction of platform slab**

7. There was media enquiry to HyD on 29 May 2018 regarding construction of the platform slab of the HUH Extension of SCL, pointing out that some of the threaded section of reinforcement steel bars for connecting the diaphragm walls and the platform slab might have been shortened. HyD was highly concerned about the issue and deployed staff, together with its M&V Consultant, to conduct on-site inspections on 30 May 2018. At the time of inspection, no serious cracks or water leakage was observed in the concrete structure of the relevant platform slab. As the issue involved major concern of construction quality, DHy met with the senior management of the MTRCL on 31 May 2018 and expressed his grave concern on the issue again. He reiterated that the MTRCL, as the project manager of the SCL project under the EA, has the responsibility to ensuring quality of works under the SCL can comply with relevant requirements. He further requested the MTRCL to submit a report on the incident. In addition, in order to ease the public’s concern about the safety of concrete structures, HyD has also requested the MTRCL to employ an independent third-party expert to carry out load tests.

8. The MTRCL submitted an incident report to HyD on 15 June 2018. The report was also uploaded to the website of the MTRCL on the same day for public’s information. An extract of the report is at **Annex 2**. According to the report, two resident site staff of the MTRCL indicated that they had seen or had been reported that there were a number of construction quality issues at the interface between the diaphragm walls and the platform slab of the East West Corridor (“EWC”), including threaded section of reinforcement steel bars were cut short, reinforcement steel bars were not fully connected to couplers, and threaded section of reinforcement steel bars were cut but deceived to be a proper connection. According to the recollection of the two MTRCL inspectors, they had raised the above issues to Leighton every time they found such problems or received reports of the issues. They also asked Leighton to rectify the works in accordance with

the established procedures. The site staff of MTRCL recollected when they subsequently inspected the works, other than one occasion in which three reinforcement steel bars had not been rectified, further irregularities were not observed.

9. The MTRCL pointed out that the statements given by one of the sub-contractors of Leighton were in contradiction to the statements given to MTRCL by Leighton. Leighton has strenuously denied the allegations raised by the sub-contractor. The MTRCL did not express any opinion on this matter. According to the information provided by MTRCL separately to HyD on this matter on 15 June 2018, HyD considered that the matter might involve criminal elements and thus referred it to the Police for follow-up action immediately.

10. According to the typical connection details between the eastern diaphragm wall and platform slab of the EWC as mentioned in the MTRCL's report, both the top and bottom layers of the reinforcement of the platform slab are connected to the eastern diaphragm wall panels using couplers. The total number of couplers is about 23,500. In addition, HyD and its M&V consultant, together with the Buildings Department ("BD"), sent staff to the site for a number of times to inspect relevant records of the MTRCL and Leighton from early June to early July 2018. The result of the inspection showed that relevant records roughly tally with the number of couplers mentioned in the report of 15 June 2018.

11. The Board of the MTRCL issued a press release on 21 June 2018, indicated that it had requested its Capital Works Committee ("CWC") to conduct a review of the management processes and procedures of the SCL project within its project integrated management system ("PIMS"). CWC has engaged external consultants to assist CWC in this review. In addition, the Board of the MTRCL has directed its management to strengthen its monitoring and supervision over all SCL contracts as an immediate action.

12. DHy met with the senior management of the MTRCL on 22 June 2018, and indicated that the MTRCL had to improve its site supervision system and communication system both internally and with the Government, and the MTRCL was requested to provide concrete improvement measures. DHy also visited the construction site of the HUH Extension on 23 June 2018.

13. A Commission of Inquiry (“Commission”) under the Commissions of Inquiry Ordinance (Cap. 86) was appointed by the Chief Executive in Council on 10 July 2018. Mr. Michael John Hartmann, former Non-Permanent Judge of the Court of Final Appeal, has been appointed as Chairman and Commissioner of the Commission, and Professor Peter George Hansford, Professor of Construction and Infrastructure Policy at University College London, has been appointed as Commissioner. The Commission shall look into the facts and circumstances surrounding the steel reinforcement fixing works in respect of the diaphragm wall and platform slab construction works at the HUH Extension under the SCL project implemented by MTRCL. The Commission can mandatorily require any person to give evidence and disclose any documents, and can also examine any person on oath. Since different parties concerned may have great controversy about certain facts and circumstances of the project involved, the Commission possesses the powers to examine any person on oath and to cross-examine these witnesses. It is therefore believed that the facts can be clarified. The hearings by the Commission would be properly recorded and the transcripts of all hearings would be made accessible to the public. In addition, all parties concerned would have the opportunity to cross-examine witnesses and make statements about other witnesses' statements. The Commission will also examine the MTRCL's system in relation to the project management and supervision aspect, and Government's control and monitoring mechanism. The Commission will also make recommendations on suitable measures with a view to promoting public safety and assuring the quality of works.

### **Change of connection details of diaphragm walls and platform slab**

14. In the course of the Government's follow-up of the incident, MTRCL submitted supplementary information to HyD on 13 July 2018. According to the EWC platform layout plan (**Annex 3**) and the connection details between the diaphragm walls and platform slab (**Annex 4**) as shown in the submitted supplementary information, with the exception of two concrete pour bays (i.e. Bay C1-1 and Bay C1-1875) of the EWC platform slab, couplers had no longer been used in the top layers of reinforcement in the connection of the platform slab with the eastern diaphragm wall in the remaining 20 concrete pour bays of platform slab in Areas B, C1, C2 and

C3. After careful study by the HyD and the BD, these details were found to be inconsistent with the drawings already agreed by BD, and hence brought about the following serious problems –

- (i) The connection details as shown in the supplementary information submitted by the MTRCL on 13 July 2018 did not correspond to those shown in the MTRCL's report submitted on 15 June 2018, and were also inconsistent with the design agreed by BD;
- (ii) The connection details as shown in the supplementary information submitted by the MTRCL on 13 July 2018 indicated that the number of couplers used was about 2,000 less than that stated in MTRCL's report submitted on 15 June 2018; and
- (iii) MTRCL has provided information to HyD demonstrating that 23,500 couplers had been used in the connection of the diaphragm walls and EWC platform slab. If the connection details as shown in the supplementary information submitted by the MTRCL on 13 July 2018 were correct, the government departments would cast doubts about the relevant information submitted earlier.

15. The Government has already referred the relevant information mentioned in paragraph 14 above to the Police and the Commission. Meanwhile, HyD would continue to obtain further information from MTRCL for follow-up actions. According to the EA, the MTRCL, as the project manager, has the responsibility to provide relevant information and other assistance to the Government within a reasonable time. HyD has written to the MTRCL reminding it to comply with the EA. The Government regrets that the MTRCL still could not explain why the above situation had occurred despite repeated reminders from HyD.

### **Follow-up measures taken due to the incident**

16. Other than the Commission mentioned in paragraph 13 above, BD had initiated investigation under the Buildings Ordinance. To strengthen the monitoring of MTRCL's implementation of the SCL project, HyD has taken the following enhanced measures–

- (i) requiring the MTRCL to include a standing agenda in the monthly PSC meetings, PCM and PPM to discuss the “Nonconformance

Reports” issued by the MTRCL to the contractors and based on the data collected, report on the trend of any improvement or worsening on the quality of works, in order to take appropriate measures. HyD will also strengthen the verification of MTRCL’s implementation of the relevant procedures;

- (ii) increasing the number of site visits of M&V consultant;
- (iii) conducting surprise site check by HyD’s in-house staff; and
- (iv) requesting the MTRCL to strengthen the communication mechanisms internally and with the Government, and improve site supervision system.

17. In addition, BD will continue to monitor the structural safety of the platform of the HUH Extension, including weekly site inspection. HyD has requested the MTRCL to install an electronic monitoring system on the platform slab for real-time monitoring.

18. Regarding the load test to be carried out at the HUH Extension, MTRCL submitted a preliminary load test proposal prepared by an independent third party expert to HyD and BD on 22 June 2018. In view of the latest development as mentioned in paragraph 14 above, the Government is unable to comprehend the actual construction details of the HUH Extension works at present, and the Government believed that the priority should be on clarifying the situation in this regard. As such, the Government has requested the MTRCL to examine and verify all construction records comprehensively and to provide the records to HyD and BD for consideration, before the methodology of the load test could be further studied. Besides, BD will also consult its appointed expert in building structural safety. Depending on the views of the expert and the Expert Adviser Team mentioned below, and whether the MTRCL could provide sufficient and reliable information and evidence, the Government would not rule out the option of opening up part of the connection between platform slab and diaphragm walls for examination.

19. The Transport and Housing Bureau announced that an Expert Adviser Team (“Expert Team”) for the SCL Project was established on 15 August 2018. The Expert Team comprises three senior retired government officers, namely Dr. Lau Ching-kwong (former Director of Civil Engineering), Mr. Hui Siu-wai (former Director of Buildings) and Mr.

Wong Hok-ning (former Head of Geotechnical Engineering Office). The Expert Team will conduct an overall review of MTR Corporation Limited (MTRCL)'s project management system, and recommend additional management and monitoring measures to be undertaken by MTRCL and Government departments as appropriate, in taking forward the SCL Project. The Expert Team will advise on the most pragmatic methodology for MTRCL to ascertain the structural safety and the as-built condition of the platform slabs and diaphragm walls of Hung Hom Station Extension, to consider any further investigations necessary in relation to the construction of key structures in all stations of the SCL Project, and to advise on any other matters relevant to the works of the SCL Project. In discharging the above duties, members of the Expert Team will represent the Government. The Expert Advisors have been appointed for a period of one year. They will complete a report on their findings in about nine months' time, and may produce interim report(s) as necessary. Professional staff from the relevant Government departments has been providing technical support to the Expert Team.

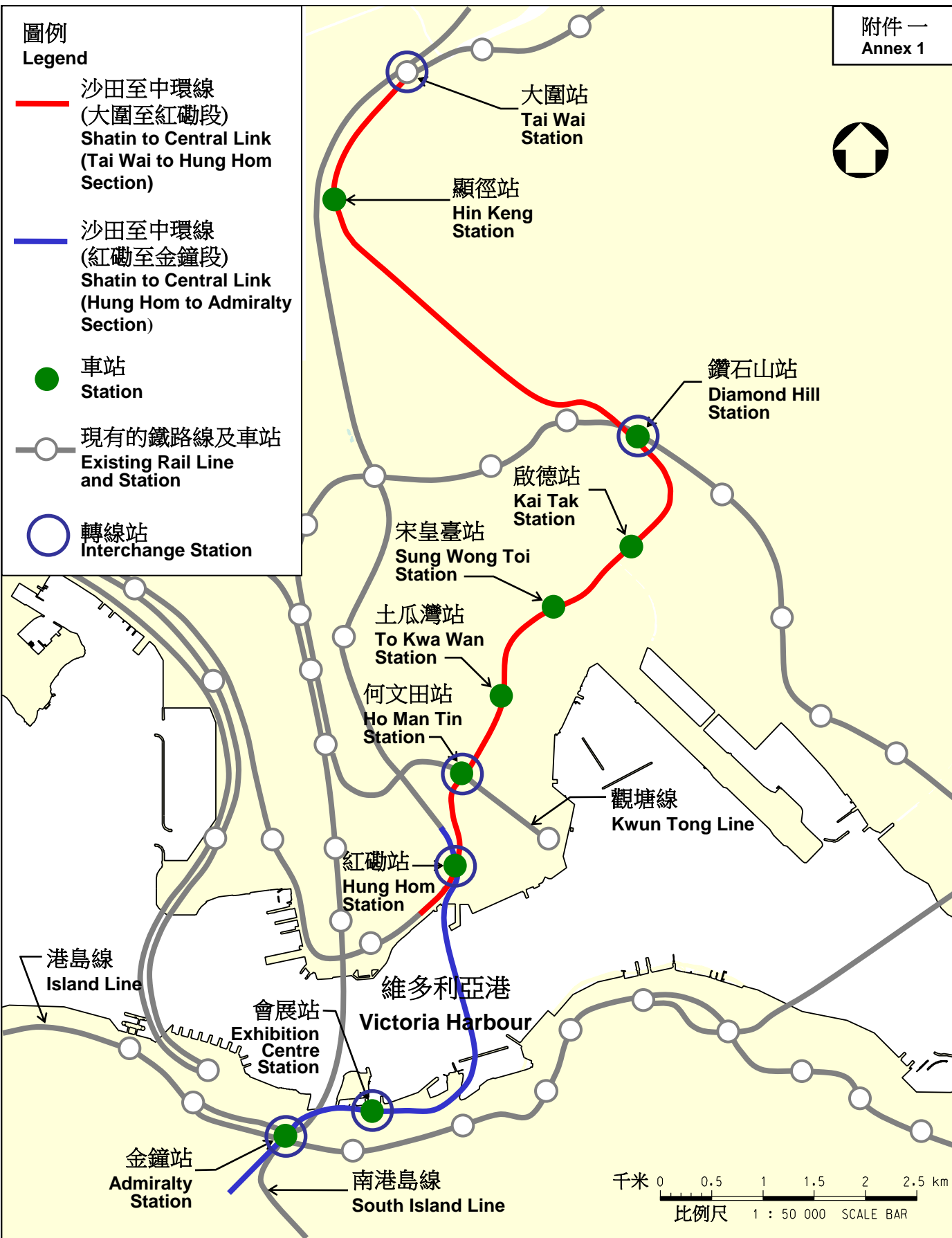
20. In future, we will also consider the results and recommendations of the Commission, and the advice from the Expert Team, with a view to further improving the monitoring of MTRCL's implementation of the SCL project.

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**Transport and Housing Bureau**  
**Highways Department**  
**August 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.

HRWSCLO03-SK0465

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鐵路拓展處 RAILWAY DEVELOPMENT OFFICE



路政署  
HIGHWAYS DEPARTMENT

## 1. Executive Summary

On 29 May, we received an enquiry from the media asking a number of questions about the steel fixing works for the East West Line platform slab of the extended Hung Hom Station being constructed as part of the Shatin to Central Link (“**SCL**”) project.

On 31 May, the Railway Development Office of the Highways Department of Government wrote to us expressing their concern on the alleged non-compliant steel fixing works found at the joints between diaphragm walls and the platform slab at Hung Hom Station under Contract 1112 and requesting us to prepare a Report into this matter, of which this Executive Summary forms part.

SCL is a strategic railway project which connects existing railway lines to form an East West Corridor (“**EWL**”) (Tai Wai to Hung Hom Section) and a North South Corridor (Hung Hom to Admiralty Section) with six interchange stations. In 2012, Government appointed MTR Corporation Limited (“**MTRCL**”) to project manage the construction and commissioning of the SCL project under an Entrustment Agreement dated 29 May 2012 (“**EA3**”). MTRCL therefore has the role and responsibilities of a project manager working on behalf of Government in carrying out the entrustment activities. The responsibilities for the actual construction of the project rest with the contractors appointed to build various parts of the project in accordance with the specifications and terms of their respective construction contracts.

The contractor appointed for the construction contract relevant to the EWL platform slab works (Contract 1112) is Leighton Contractors (Asia) Limited (“**Leighton**”). Under its construction contract, Leighton has an overarching obligation to construct the works in a manner that complies in all respects with the contract and the specification and approved design drawings. In addition, the contract specifies certain quality control and assurance processes which must be followed. These are described in more detail below and in the body of the Report. From a statutory perspective, Leighton also has obligations under, inter alia, a Site

Supervision Plan and a Quality Supervision Plan (“**QSP**”) in accordance with the requirements of the Buildings Department (“**BD**”). These obligations include carrying out full time and continuous supervision of **all** the reinforcing bar and coupler splicing assemblies on site, thus obliging Leighton to verify the effective assembly and connection of all reinforcing bar with couplers in accordance with the specification, approved design drawings and QSP. The same QSP obliges MTRCL to supervise at least 20% of the splicing assemblies in general, increased to 50% where the structure acts as a transfer plate.

In project managing the construction of the SCL project, MTRCL is obliged (under EA3) to follow our Project Integrated Management System (“**PIMS**”). This system is certified to be ISO9001 compliant and has been used to manage railway projects for over 20 years. The system, which is embedded within our construction contracts, including Contract 1112, requires a number of “hold points” in any construction activity i.e. points at which a notice of permission, consent or no objection is required before the next activity can be proceeded with. In the construction of the EWL platform slab, there were a number of hold points, including one after completion of the slab bar bending, preparation and fixing works and another before the pouring of concrete. At these hold points, Leighton, once it had inspected and was satisfied that the relevant works had been completed in accordance with the specification, the approved drawings and the QSP, was required to sign and submit a Request for Inspection and Survey Checks (“**RISC**”) form to MTRCL, and we would then perform our own inspection, which would be signed off by, in the case of the slab bar bending, preparation and fixing works RISC form, both an on-site MTRCL inspector and an on-site MTRCL engineer and, in the case of the pre-pouring of concrete RISC form, an on-site MTRCL inspector. However, work in progress issues discovered during regular on-site inspections before hold points are not required to be documented, as such issues would be rectified before the next hold point. Hence, verbal instructions are usually given on site by MTRCL inspectors to Leighton to rectify such issues.

As Government's appointed project manager for the SCL project we have, since being notified of this issue and within the limited time available, taken all steps practicable to carry out an investigation into the matter with a view to answering all of the questions raised by RDO and BD and to addressing any subsequent concerns or comments raised in the media. These steps have included interviewing 19 relevant current and ex members of MTRCL staff, interviewing three individuals made available by Leighton and interviewing representatives from two of Leighton's sub-contractors, Fang Sheung Construction Company ("**Fang Sheung**") and China Technology Corporation Limited ("**China Technology**"). In relation to the EWL platform slab, Fang Sheung was responsible to Leighton for carrying out the slab bar bending, preparation and fixing works and China Technology was responsible for erecting formwork, carrying out cleaning prior to pouring concrete and for concrete pouring. We have also reviewed relevant documentation and site records within our possession and made available to us by Leighton. Further details of the evidence gathering exercise we have carried out are set out in Section 3 of this Report.

While, as can be seen from the above, considerable time and effort has been made in the evidence gathering exercise and the subsequent compilation of this Report, it must be recognised that the works in question were carried out some 2 to 3 years ago. As the issue at hand relates to work in progress matters, much of the evidence gathered has, by necessity, been sourced from interviews with those involved in the works and there are, unfortunately, some differences between the recollections of certain individuals.

In addition, oral statements made during the interview of one of Leighton's sub-contractors contradict assurances given to us by Leighton. Following the interview during which such statements were made (which was observed by two representatives of Leighton) Leighton has strenuously denied such allegations. MTRCL has not seen any documentation which substantiates the allegations and emphasises that it does not form any opinion on the credibility or reliability of the allegations.

Bearing in mind the nature of the statements, the inevitable limitations on the investigation to date and taking into

consideration legal advice, information relating to the statements will be passed to Government separately. Noting that a Commission of Inquiry has been established, it is anticipated that all relevant information relating to the allegations will be provided to the Commission in due course. We welcome the work to be carried out by the Commission, which has extensive powers, and will cooperate fully with the Commission.

Based on the recollections of all the current and ex-MTRCL staff members interviewed, none of them actually witnessed the threaded sections of reinforcement steel bars being cut. However, two members of site staff recall either seeing themselves or having reported to them evidence that such cutting had taken place, such as a gap between a threaded steel bar and a coupler connection or the cut ends of threaded steel bars.

One member of site staff recollects that, on five occasions between August 2015 and December 2015, he either saw or had reported to him that the threaded section of reinforcement steel bars had been cut. Following what he believes to be the third of these occasions in December 2015 (which he recollects was originally reported to him by the second member of site staff referred to below and subsequently observed by him in an inspection), the issue was raised to Leighton by email, with a request to “*strengthen their quality checks and keep a high level of quality control*”. As a result of this email, Leighton issued a formal Non-Conformance Report to Fang Sheung, which was actioned and closed out.

The second member of site staff recollects that, on two occasions over the same time period, he saw evidence that the threaded section of reinforcement steel bars had been cut. His memory is that, on the first of these occasions, he took a photograph of the cut threaded end of a steel bar in his hand. Having seen a copy of the email to Leighton referred to above (which had a number of photos attached to it), he believes that this photograph is one of those which was attached to the email.

It is highly likely that the third occurrence recollected by the first member of site staff was the same as the first occasion recollected by the second member of site staff.

Again, according to the recollections of those interviewed, no further incidences of cut threaded steel bars were discovered by MTRCL staff after December 2015.

On each occasion on which the MTRCL inspectorate staff recall that they found such issues or had the issues reported to them, they further recollect that they raised the issues with Leighton and asked Leighton to rectify the works in accordance with the process described above for work in progress issues. The site and engineering staff recollect that they subsequently inspected the works and, subject to one occasion, did not observe any further irregularities. There is one occasion in relation to which one of the members of site staff recollects that three threaded steel bars remained unrectified. However, it should be noted that this recollection was not shared by other members of staff during the interviews and all RISC forms relating to these works were signed.

In January 2017, China Technology sent an email to Leighton alleging “*malpractice use (sic) of coupler in this project SCL1112*” (which email Leighton forwarded to MTRCL). As a result of such allegation, Leighton requested its Head of Engineering to lead an investigation into this matter, which investigation concluded that the construction and checking process had been carried out in accordance with the approved method statement and the inspection and test plan. The report produced to record the findings of this investigation was shared with MTRCL. Based on this investigation report, MTRCL concluded that the issue had been dealt with.

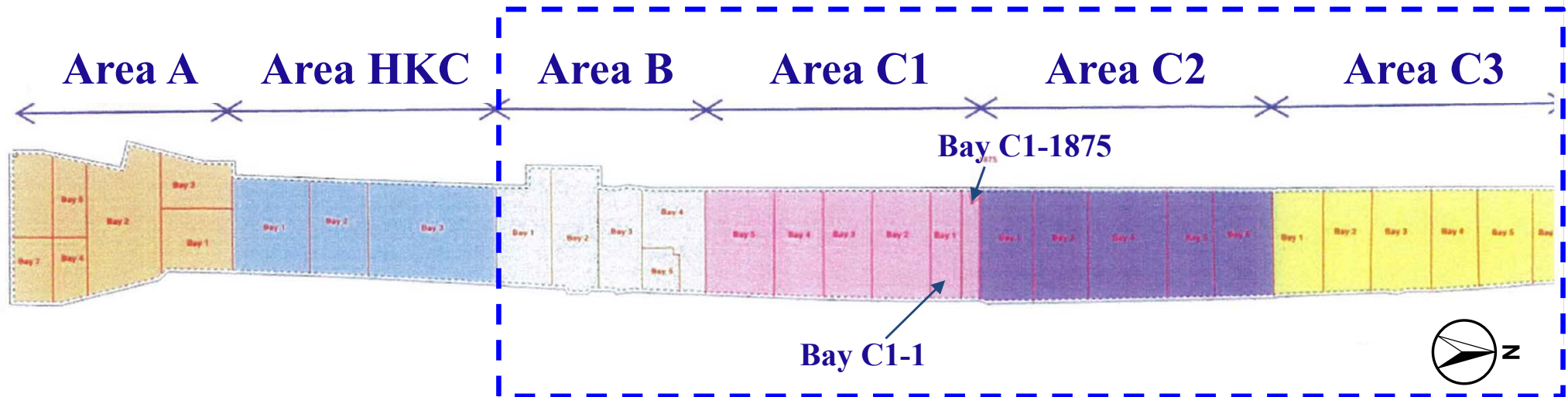
On 15 September 2017, China Technology sent an email to Government’s Transport and Housing Bureau requesting a discussion on “*an important issue ... on the execution of the works*”, a request which was subsequently withdrawn by China Technology (on 18 September 2017) on the basis that they had reached a “*satisfactory and full clarification ... on the suspecting (sic) technical issue*” and they believed “*it is a*

*full and final end to the issue and may we invite (sic) to close all relevant files accordingly”.*

The records for Contract 1112 contain all relevant RISC forms for the EWL platform slab works and do not contain reference to any outstanding issues relating to trimming of the threaded sections of reinforcement steel bars. In addition, Leighton has confirmed to us in writing that “*the works on the Hung Hom Station and Stabling Sidings project were undertaken in strict accordance with its quality systems and the specifications of the contract*” and that “*the Works have been constructed in accordance with the Contract and statutory requirements.*” At our request, these statements were reconfirmed by Leighton following the allegations referred to above. Separately, from a statutory perspective and as required under the QSP approved by BD, Leighton has certified completion of the EWL platform slab works, which includes certification of compliance with the quality site supervision requirements referred to above (i.e. a requirement for full time and continuous supervision of all the reinforcing bar and coupler splicing assemblies). MTRCL also confirms compliance with our requirement to supervise at least 20% of the splicing assemblies in general, increased to 50% where the structure acts as a transfer plate.

Notwithstanding the above and to provide additional assurance to the public over the structural integrity and safety of the EWL platform slab, we have engaged an independent expert to carry out a safety test to confirm the structural safety of the relevant structure. The methodology for this test is being developed and the results of the test (once available, which may take a number of months) will be made public and available to the Commission of Inquiry.

## East West Corridor (“EWC”) platform slab concrete pour plan



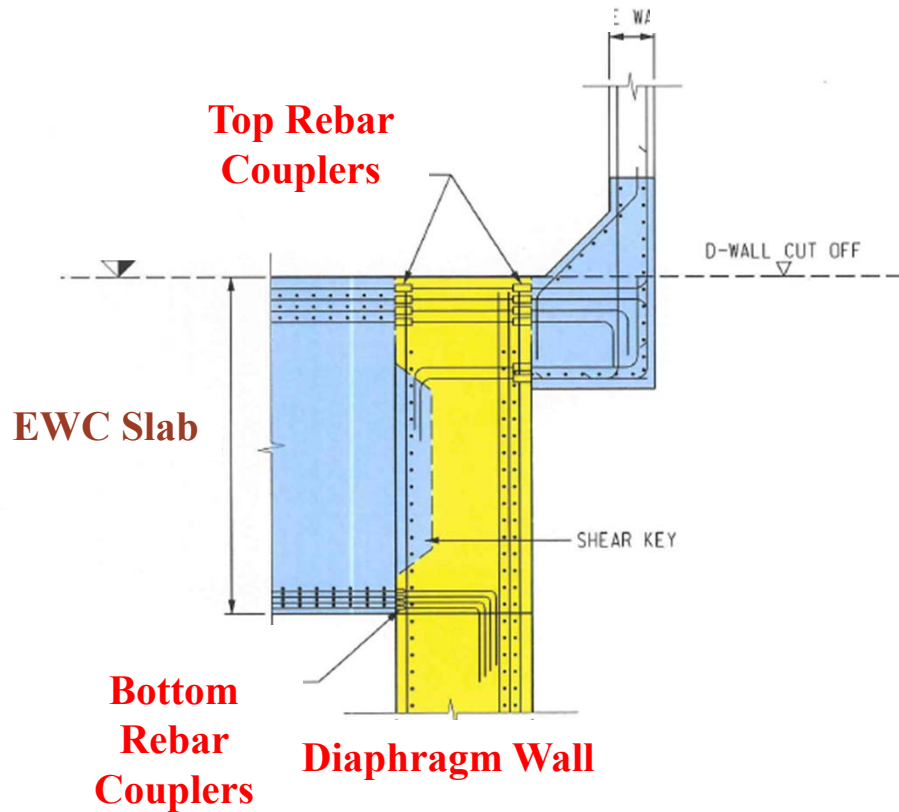
- Total 32 concrete pours for the entire EWC slab
- Incident relating to construction of the platform slab involves Areas B, C1, C2 and C3 (22 bays in total)

**Note :** The plan is extracted from MTRCL’s incident report issued on 15 June 2018

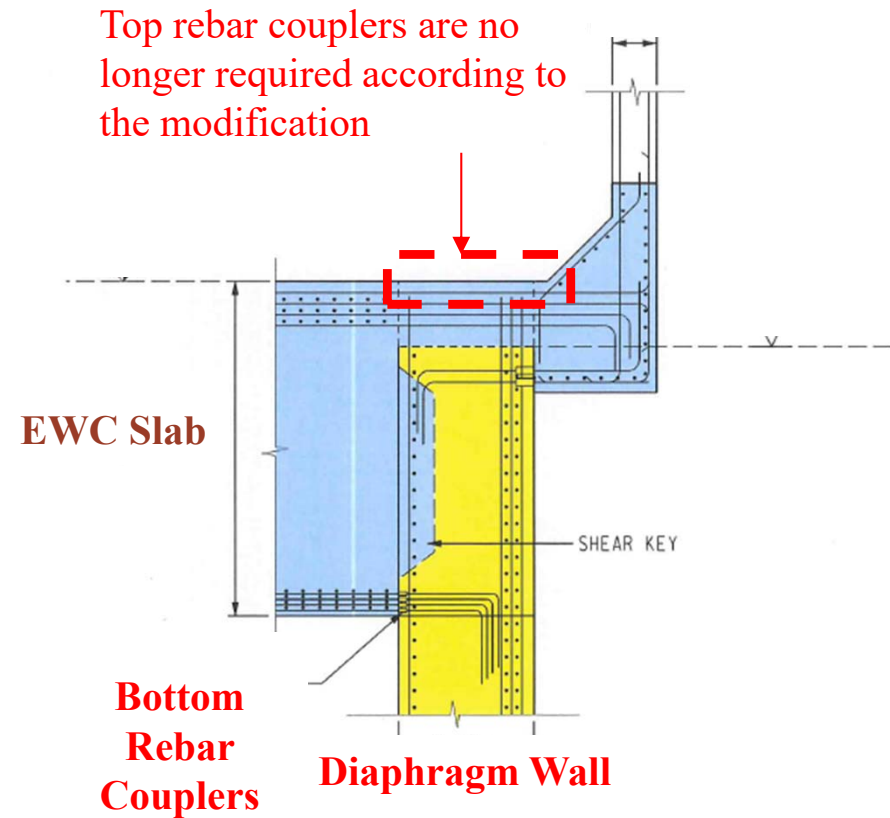


# Supplementary information from MTRCL dated 13 July 2018

## Connection details of EWC slab and diaphragm wall



**EWC Slab and Diaphragm Wall (East) Connection Detail (1)**  
**(For bays C1-1 and C1-1875 only)**



**EWC Slab and Diaphragm Wall (East) Connection Detail (2)**  
**(For the remaining bays at Areas B、C1、C2 & C3 except bays C1-1 & C1-1875)**