Legislative Council Panel on Transport
Subcommittee on Matters Relating to Railways

Progress Update of the Construction of the Shatin to Central Link (As at 31 December 2018)

(Translation)

Introduction

This paper reports to Members on the progress of the main construction works of the Shatin to Central Link ("SCL") as at 31 December 2018.

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 bringing improvements to 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**). Admiralty Station and Ho Man Tin Station will become integrated stations providing interchange service to passengers of SCL and South Island Line (East)("SIL(E)"), as well as passengers of SCL and Kwun Tong Line Extension ("KTE") respectively.

4. The entire SCL project is funded by the Government under the "concession approach". The MTR Corporation Limited ("MTRCL") is entrusted by the Government to carry out the construction of the project. On 18 February

2011, the Finance Committee of the Legislative Council approved the funding applications for "**63TR** – Shatin to Central Link – construction of railway works – advance works" and "**64TR** – Shatin to Central Link – construction of non-railway works – advance works" with a total of about **$7,700 million** (in money-of-the-day prices). Thereafter, the Government and MTRCL entered into an agreement for entrusting to the latter the advance works of SCL at the expanded Admiralty Station and Ho Man Tin Station while implementing SIL(E) and KTE respectively. The advance works commenced in May 2011.

5. Regarding the main works of SCL, the Finance Committee of the Legislative Council approved the funding applications on 11 May 2012 for "**61TR** – Shatin to Central Link – construction of railway works – remaining works" and "**62TR** – Shatin to Central Link – construction of non-railway works – remaining works" with a total of about **$71,400 million** (in money-of-the-day prices). Thereafter, the Government and MTRCL entered into an agreement for entrusting construction, testing and commissioning of the main works of SCL to the latter. The entrustment cost concerned is about $70.8 billion. MTRCL has been entrusted to provide management and monitoring service to the SCL project. The main works commenced in July 2012. According to the agreement for the main works of SCL, the original target commissioning date for the "Tai Wai to Hung Hom Section" is December 2018 and the original target commissioning date for the "Hung Hom to Admiralty Section" is December 2020.

6. The Finance Committee of the Legislative Council approved the funding application for increasing the Approved Project Estimate of **63TR** by $847.7 million from $6,254.9 million to $7,102.6 million at its meeting on 17 June 2017 for the additional fund required by the Government for the SCL advance railway works. The Approved Project Estimate for the entire SCL project is adjusted upward from the original estimate of $79,800 million to **$80,700 million**[1] (in money-of-the-day prices).

7. The Government received the revised cost estimate of the main works of the SCL project from MTRCL on 5 December 2017. MTRCL indicated a need of adjusting upward the entrustment cost of the main works of the SCL project,

[1] The Approved Project Estimate for the entire SCL project comprises (i) Protection Works (**58TR** Shatin to Central Link – construction of railway works – protection works and **59TR** Shatin to Central Link – construction of railway works – protection works in Wan Chai Development Phase II) of about $700 million (in money-of-the-day prices); (ii) Advance Works (**63TR** and **64TR**) of about $8,600 million (in money-of-the-day prices); and (iii) Main Works (**61TR** and **62TR**) of about $71,400 million (in money-of-the-day prices). The total is about $80,700 million.

from $70.8 billion to $87.3 billion, i.e. an increase of about $16.5 billion. MTRCL considered that the main reasons for the increase in construction cost including the archaeological and conservation works at Sung Wong Toi Station, the additional expenses due to delays in the handover of work sites at Wan Chai north, and the station works required for allowing flexibility for the topside development at Exhibition Centre Station.

8. Since December 2017 when MTRCL submitted the revised cost estimate of the main works of SCL project, the Highways Department ("HyD"), in collaboration with the monitoring and verification ("M&V") consultant, have held several meetings with MTRCL, and is reviewing rigorously the information given by MTRCL as well as the assumptions and basis of the cost estimate of works by MTRCL to ascertain whether there are sufficient justifications for the estimate. In view of the recent development of SCL project, the Government needs more time to verify the facts and the condition of the works. Upon completion of the detailed assessment and review, the Government will apply for additional funds from the LegCo to continue with the SCL works.

Latest Progress of the Main Works

9. The progress report of the SCL project as at 31 December 2018 submitted by MTRCL is at **Annex 2**. Our analysis and supplement on the progress report are provided below.

Tai Wai to Hung Hom Section

Shatin Section (Section of Railway between Tai Wai Station and Ma Chai Hang, Wong Tai Sin, including Hin Keng Station and Modification of Station Platforms of Ma On Shan Line)

10. Building services works and electrical and mechanical (E&M) works at Hin Keng Station, the connecting elevated and at-grade tracks were completed and the relevant system testing inside the station was on-going. Construction of the Emergency Vehicular Access outside the station, diversion works for the underground utilities and road reinstatement works at Che Kung Miu Road were completed. Train and various systems tests were on-going.

Wong Tai Sin Section (Section of Railway between Ma Chai Hang, Wong Tai Sin and Kai Tak, including Diamond Hill Station)

11. Building services works and E&M works, in the Diamond Hill Station and underneath Lung Cheung Road, of the two pedestrian adits connecting SCL and the Kwun Tong Line were completed. The relevant system testing and statutory inspections continued. Reinstatement works for all the carriageways at Lung Cheung Road was completed while the remaining reinstatement works at footpaths was on-going. The construction of the emergency access point at the junction of Wong Tai Sin Road and Sha Tin Pass Road was completed. The structure at the adjacent Public Transport Terminus was substantially completed and the associated access road construction was being arranged. The construction of the Ventilation Building at the former Ma Chai Hang Recreational Ground was completed and the relevant system testing was in progress.

Kowloon City Section (Section of Railway between Kai Tak Station to Ho Man Tin Station, including Sung Wong Toi Station (formerly named as To Kwa Wan Station) and To Kwa Wan Station (formerly named as Ma Tau Wai Station))

Kai Tak Station

12. The building services systems and E&M systems at Kai Tak Station were substantially completed and the relevant system tests inside the station and the statutory inspections were on-going. Inspection and rectifications of the at-grade footpath outside the station were underway for handing over the footpath to the relevant departments as soon as possible.

Sung Wong Toi Station

13. As we stated in the papers submitted to this Subcommittee and the Panel on Development in November 2014, due to the preservation in-situ of the remnants at and in the vicinity of Adit C connecting the station and Pak Tai Street (i.e. items 6 to 10 of the archaeological features at **Annex 3**), the entire alignment of the adit would be seriously affected. It would be necessary to identify a suitable alternative alignment. MTRCL awarded a works contract in July 2018 to study the alternative alignment of Adit C, including the archaeological investigation work along the possible alignments. In other words, Adit C connecting the station and Pak Tai Street would hardly be completed at the same time as Sung Wong Toi Station. A temporary access at grade would be required

to connect the station entrance/exit. In case that suitable and cost-effective alternative alignment could not be constructed eventually as a result of further archaeological discoveries or other constraints of on-site situation, residents in the vicinity of Pak Tai Street could still use the existing pedestrian crossing facilities at Sung Wong Toi Road to gain access to Sung Wong Toi Station (see **Annex 4**). MTRCL is also studying the addition of at-grade crossing at Sung Wong Toi Road and Tam Kung Road, which is adjacent to Pak Tai Street, for reducing the walking distance between the vicinity of Pak Tai Street and the station entrance/exit. MTRCL plans to temporarily close part of the Pak Tai Street in the first quarter of 2019 to commence archaeological investigation work. Upon completion of the preliminary study on the replacement of the alignment of the Adit C and other alternative scheme for connecting the station, MTRCL will consult the Kowloon City district council and relevant local community about to the relevant result of the preliminary study so as to ensure that the alternative scheme was as convenient as possible and could meet the residents' needs.

14. After completion of the archaeological investigation work in 2014, the construction works of Sung Wong Toi Station fully resumed in March 2015. Up to end-December 2018, the structural works, building services works and E&M works of the station were completed. Relevant system tests inside the station and the statutory inspections were underway. The fitting out works at the station entrances and the construction of at-grade footpath were also in progress. In order to minimise the impact on adjacent shops, the Government urged MTRCL to complete the works of the station entrance/exit at Nam Kok Road as soon as possible. The roadside metered car parking spaces opposite to the station entrance/exit at Nam Kok Road were opened for public use at the end of October 2018.

To Kwa Wan Station

15. Tests for the relevant system inside To Kwa Wan station and the statutory inspections were underway. Fitting out works inside the station were also on-going. Fitting out works at the station entrances and ventilation building, and the reinstatement of underground utilities at Ma Tau Wai Road were also on-going. The progress was generally on schedule. To cater for the underground construction works of To Kwa Wan Station, the traffic diversion had to be implemented for a section of Ma Tau Wai Road between Chi Kiang Street and Sheung Heung Road. Most of the section of Ma Tau Wai Road affected by the SCL works are operating in two-lane and two-way mode. It is expected that Ma

Tau Wai Road will be resumed in three-lane and two-way mode progressively in the third or fourth quarter of 2019.

16. Regarding the earlier incident about the removal of reinforcement bars from a platform wall at the To Kwa Wan station, we provided the details at a special meeting of the Sub-committee on Matters Relating to Railways on 6 July 2018. Please refer to the paper submitted by the Government to the Sub-committee (LC Paper No. CB(4)1354/17-18(01)). MTRCL has already confirmed that the condition of the wall would not pose any safety risk to the interior wall, adjacent staircases and escalators. However, the incident revealed the problems in MTRCL's supervision of works, for instance, part of the works supervised by MTRCL were not constructed in accordance with the drawings, HyD had not been informed by MTRCL of the construction problems at To Kwa Wan Station on a timely basis. The HyD has requested the MTRCL to review the implementation of its works supervision system and the communication mechanism for both within the MTRCL and with the Government. The HyD received a reinstatement proposal of the relevant wall from MTRCL in end-July 2018 and requested MTRCL in end-August 2018 to submit detailed supplementary information such as the thickness of the existing wall, test records for proposed concrete materials for reinstatement works and how the reinstatement proposal can comply with the requirement of the Buildings Ordinance and structural integrity, etc. After detailed review of relevant information submitted by MTRCL in early October 2018, HyD agreed with the reinstatement proposal in early November 2018. MTRCL is carrying out the reinstatement works for completion by the first quarter of 2019.

17. According to the MTRCL's records, the settlement records for some monitoring points had exceeded the pre-set trigger levels during the construction period of To Kwa Wan Station. MTRCL had taken relevant measures in accordance with the mechanism, including setting up more monitoring points, arranging the inspection of the condition of buildings for registered structural engineers, and carrying out grouting works near buildings for strengthening the underground stratum, etc. According to the MTRCL's assessment, for buildings near To Kwa Wan Station with settlement record reaching the third level, the level of tilting is less than that specified in the "Practice Notes for Authorized Persons, Registered Structural Engineers and Registered Geotechnical Engineers" issued by Buildings Department. MTRCL also confirmed the structural safety and stability of the buildings in the performance review after the completion of the station structure. The construction works of the main structure of the station was

substantially completed in December 2016. Officers of Buildings Department (BD) and HyD inspected the buildings concerned in August 2018, and did not identify any obvious structural safety problem. MTRCL also arranged registered structural engineers to inspect 23 nos. buildings affected by settlement near the site of To Kwa Wan Station; the results confirmed that all the 23 buildings are structurally safe. We provided the details at the special meeting of the Sub-committee on Matters Relating to Railways on 31 August 2018. To allay public concerns, MTRCL also submitted a paper (LC Paper No. CB(4)1504/17-18(04)) promulgating the recent settlement monitoring data along the SCL.

18. The Transport and Housing Bureau (THB), HyD, BD and MTRCL have reviewed the existing arrangement and followed the advice from the SCL Expert Adviser Team ("EAT") engaged by the THB to set up an announcement mechanism for the SCL works. The Government promulgated the monitoring and announcement mechanism for impact of SCL works on nearby structures and public facilities on 29 September 2018. Currently, the cumulative settlement of the affected facilities near To Kwa Wan Station, including buildings, public utilities and roads, does not exceed the pre-set or updated trigger levels. The MTRCL would continue to monitor these monitoring points.

19. The implementation of SCL railway project is authorized by Railways Ordinance (Cap. 519). For any physical or structural damage to buildings resulting from the construction of railway works of SCL Tai Wai to Hung Hom Section, a written claim could be served to the Secretary of Transport and Housing according to the Railways Ordinance. The relevant written claim would then be referred to Lands Department who, would process the claim according to the procedures stipulated in the Railways Ordinance. On the other hand, upon receipt of the complaints from residents on cracks in their buildings, MTRCL's and Contractor's staff members will conduct site inspections, including visually inspecting the buildings, taking photo records, auditing records of the relevant monitoring points, and checking the condition survey records of the relevant building unit conducted before the commencement of the works, in order to ascertain whether the cracks appeared after commencement of the SCL works. The cases would then be referred to an independent loss adjuster for investigation and follow-up action. MTRCL had revised the relevant procedures. When the loss adjustor completed its investigation, the report would be sent to the claimant direct with a copy to MTRCL. MTRCL will not preview the report. In view of the public's concerns, MTRCL implements the scheme "To Kwa Wan Station

Community Care Programme" on a without prejudice basis for the provision of financial assistance through simplified procedures and practical means to the affected owners of building units in the vicinity of To Kwa Wan Station for maintaining walls in their units. The scheme has been launched since January 2019.

20. On 24 October 2018, the EAT of the THB published its Interim Report No. 1. In the report, the EAT indicated that MTRCL should ensure the reliability and coherence of the settlement monitoring data of SCL project. When settlement data exceeded the alarm level, MTRCL should assess the damage which provides a basis for verifying the need of mitigation measures. The EAT would also conduct audits of selected cases in the SCL Project to assess the effectiveness of the monitoring and control system.

Hung Hom Section (Section of Railway between Ho Man Tin Station and Hung Hom Station, including the modification works of Hung Hom Station and associated tunnelling works)

21. E&M installation works adjacent to the railway track in the tunnel of the section from Ho Man Tin Station to Hung Hom Station were completed. For the tunnel section near Princess Margaret Road connecting the East Rail Line and the new platforms of Hung Hom Station, track laying works and E&M installation works adjacent to the railway track were substantially completed. The progress of the above works is generally on schedule. Besides, construction of the SCL platform and structural works of the tunnel at Hung Hom Station was completed. Building services and E&M works inside the station is generally on schedule. System testing and statutory inspections have been conducted progressively.

22. The Government attaches great importance of the incident of re-bar cutting at the platform of the Hung Hom Station Extension under the SCL project reported in end-May 2018 as it is related to public safety. The Chief Executive and the Executive Council appointed on 10 July 2018 a Commission of Inquiry ("Commission") which is chaired by Michael Hartmann, former Non-Permanent Judge of the Court of Final Appeal, under the Commissions of Inquiry Ordinance (Chapter 86) to carry out investigations on the facts and circumstances surrounding the construction works of the diaphragm wall and platform slab of Hung Hom Station Extension under the SCL project. The Commission would review the MTRCL's project management system and supervision system, etc. as well as the monitoring and regulatory mechanisms of the Government, and would

also suggest appropriate measures in order to promote public safety and assurance on the quality of works. The Commission's substantive hearing commenced on 22 October 2018 and was completed on 19 December 2018. The hearing of expert evidence commenced on 10 January 2019 and was completed on 18 January 2019. The hearing of closing submissions by all involved parties would be finished before 29 January 2019. The Commission plans to submit a report to the Chief Executive by 26 February 2019.

23. Since MTRCL has failed to submit comprehensive as-constructed records including the working drawings used during contruction to ascertain the as-constructed condition and clarify the quality of works where there were honeycomb etc, THB, EAT, relevant government departments, experts of the Department of Civil Engineering and the Department of Statistics and Actuarial Science of the University of Hong Kong (HKU) and MTRCL have held several meetings to discuss the solutions. The Government requested MTRCL to formulate a holistic strategy to verify the condition of the platform slab structure of the Hung Hom Station Extension. The holistic strategy may include reviewing and verifying all construction records, opening up part of the connection of the platform slab and diaphragm wall for inspection, conducting non-destructive tests and load tests, etc. On 15 October 2018, MTRCL submitted the first stage of holistic proposal on the as-constructed condition of the platform slab and the diaphragm wall of the EWL of the Hung Hom Station Extension to the Government. The Government rigorously reviewed the report and provided comments to MTRCL. On 24 October 2018, the EAT submitted its first interim report to THB and explained its work progress and proposal for handling the structural problems of the Hung Hom Station Extension, including their observations and doubts on the aforementioned MTRCL's first stage report. EAT considered the scope of MTRCL's first stage report narrow and not in full compliance with the requirements of a comprehensive assessment.

24. After several discussions between the government and MTRCL, MTRCL submitted the latest version of the holistic assessment strategy on 4 December 2018. According to the MTRCL's proposal, the holistic assessment will be conducted in three stages. For the first stage, the MTRCL will review the relevant construction records and the latest design amendment drawings. In the second stage, MTRCL will open up part of the East West Corridor and the North South Corridor platform slabs to verify the details of the rebar connections and whether the couplers and rebars are properly connected. In the third stage, MTRCL will conduct a comprehensive review and analysis of the structural safety and integrity

of the entire Hung Hom Station based on the verification results of the first and second stages to ascertain if the overall structural integrity of the works is acceptable and determine if it is necessary to carry out strengthening works.

25. The opening-up at the second stage has two purposes: (i) to verify the as-constructed conditions of part of the Hung Hom Station Extension platform slab and diaphragm wall connections through opening up the concrete for physical investigation. This will involve opening-up of 24 locations at East West Corridor platform slab for inspection, and (ii) in view of the allegations on rebar cutting of steel bars, MTRCL needs to open up certain connections between the slabs and diaphragm walls for detailed inspection and to verify the works quality of the coupler connections through non-destructive tests. In accordance with the results of random selection, MTRCL opens up 28 locations from each of the platform slabs of both East West Corridor and North South Corridor, that is, a total of 56 locations, allowing at least 168 steel bars or couplers to be exposed for inspection. HyD and MTRCL held a joint press conference on 5 December 2018 introducing the holistic assessment strategy to the public and announcing the acceptance of the proposal by the Government.

26. The Government considered that the opening up and examination works shall be conducted out in a stringent, fair and safe manner to ensure the reliability of the results. Therefore, in selecting the location of the opening up, the Government has invited expert team from the Department of Statistics and Actuarial Science of the University of Hong Kong to conduct random sampling. The random sampling was completed on 10 December 2018 and was witnessed by the members of THB's EAT for the SCL Project and the representatives of HyD, BD and MTRCL. Firstly, the process involved the random selection of 56 locations at platform slabs. Then, based on the latest drawings provided by MTRCL and depending on the number of layers of steel bars inside the slab, the slab is opened up to the depth of a certain layer randomly selected. As the width of each opening-up location is about 400 millimetres, a set of three steel bars will be exposed for examination. This method, known as cluster sampling, is commonly used in statistics. As for the non-destructive test on coupler connections, MTRCL proposed using phased array ultrasonic examination, which was considered viable by EAT for the SCL Project, experts from the Department of Civil Engineering of HKU and relevant government departments.

27. In accordance with the Buildings Ordinance, MTRCL has appointed a registered contractor to carry out the opening-up works The detailed method

statement submitted by MTRCL has also been agreed by the Building Authority prior to the opening-up. The representatives from BD, HyD and its monitoring and verification consultant will monitor the situation, keep records, and, in particular, review the critical steps to ensure the process complies with the agreed method statement. MTRCL shall assign technically competent persons as required by the Buildings Ordinance to supervise the opening-up and test process. Police officers are also present at the scene.

28. The second stage of the opening-up of concrete and test commenced on 10 December 2018. The relevant results have been uploaded to the Highways Department's website for the SCL project on a regular basis for reference by the public. As at 28 January 2019, MTRCL has commenced opening-up at 18 locations for purpose (i) and has completed the test for 103 nos. coupler connections for purpose (ii). The latest results are given in **Annex 5**. Although MTRCL has agreed to expedite the progress and has extended the working hours of the opening-up, the completion date cannot be ascertained at this stage. The Government will continue monitoring the opening up and the tests.

29. Regarding the concerns on safety during the opening-up of concrete slabs at the East West Corridor, the Government emphasises that there is no compromise on site safety. Apart from requiring MTRCL to conduct regular inspections, the Government will also inspect the site to ensure that all parties strictly implement relevant safety measures. Up to now, no non-compliance on site safety is observed and the Government and MTRCL will continue monitoring the safety of the site works.

30. As a matter of prudence, the Government would check the major structural works of other stations of the SCL project to confirm if there are quality issues similar to those at the Hung Hom Station Extension. Under the supervision of the EAT under THB, HyD and the M&V consultant would review the construction works of other stations in stages, with the first batch covering To Kwa Wan Station and Diamond Hill Station. Relevant works will commence shortly.

31. Besides, given the insufficient RISC forms of the Hung Hom North Approach Tunnel (NAT) and Hung Hom South Approach Tunnel (SAT), MTRCL issued non-conformance reports to the Contractor in April 2018, and reported the case to HyD in June and July 2018. HyD has been following up the issue and requested MTRCL to provide details. In December 2018 and January 2019,

MTRCL informed HyD of the extent and scope of the missing construction records, but was still unable to provide a complete account of the case. Details are at **Annex 6**. In view of the community's concern on the Hung Hom Station works, the Government made a public announcement of the issue and the next steps on 30 January 2019. The Government has sternly requested MTRCL to provide a detailed account of the case; review whether there are similar problems in other parts of the relevant contract; submit a holistic study to ascertain the as-constructed conditions; and assess the programme implications on the full or partial commissioning of the Tuen Ma Line.

Hung Hom to Admiralty Section

Cross Harbour Section (*Section of the tunnel across Victoria Harbour*)

32. The main works of the Cross Harbour Section continue. The construction works of the ventilation building near the shore at Hung Hom was in progress. Installation of immersed tube tunnel units and connection works of the tunnel units were completed. The backfilling works at the seabed trench of Victoria Harbour and the remaining structural works inside the tunnel were in progress. The overall progress of the Cross Harbour Section is generally on schedule.

Hong Kong Island Section (*Section of Railway between Wan Chai North and Admiralty Station, including Exhibition Centre Station*)

33. The excavation of the up-track and down-track TBM tunnel from Fenwick Pier Street to Admiralty Station was successfully completed in May 2017 and November 2017 respectively. The up-track and down-track connection works between Admiralty Station and the tunnel was completed in March and July 2017 respectively. The structural works for connecting the tunnel and Admiralty Station was also completed. For the cut and cover Western Approach Tunnels from the west of Exhibition Centre Station to Fenwick Pier Street, the tunnel construction works and structural works for the emergency access were on-going.

34. The main works of Exhibition Centre Station are not only highly complicated, but also involve a wide extent of sites. For instance, prior to the construction of Exhibition Centre Station at the ex-Wan Chai North public

transport interchange, ex-Wan Chai swimming pool and the existing Harbour Road Sports Centre, the re-provisioning works of these facilities had to be completed before the demolition works take place. As there was a need to maintain the services of the above facilities at their original locations before they were re-provided at the new places, only limited site investigation works could be carried out and the detailed site investigation works could only be conducted after the new facilities are re-provided. As such, the geological conditions in these areas remain uncertain and may affect the progress and the cost of works. Furthermore, since parts of Exhibition Centre Station are located underneath the busy and narrow roads in Wan Chai North, large scale temporary traffic management schemes are required to be implemented in stages in order to make rooms for the construction of Exhibition Centre Station. The limited space has posed constraints on the planning of works, such as site arrangement, works sequence and the associated integrated temporary traffic management schemes etc. The diversion of Fleming Road box culvert and the congested underground utilities will also be required to facilitate the construction of Exhibition Centre Station that runs across Fleming road. Prior to the works commencement, it was not possible to close the said road to carry out trial trenches for verifying the information provided by utility companies and relevant departments about the number and location of the underground utilities there. In addition, the current conditions of some of the utilities are unsatisfactory, hence repairing works are required prior to the excavation works. These have increased the construction difficulties and uncertainties, thereby posing certain risks to the works progress.

35. After MTRCL had demolished the original Harbour Road Sport Centre, the pipe piling works were completed and the bulk excavation works were being conducted. Results of the further ground investigation works at the original HRSC showed that the actual rockhead level was higher than anticipated, thus protracting the construction period and affecting the progress of the works.

36. To facilitate the re-provisioning of the footbridge at Convention Avenue connecting to Wan Chai Ferry Pier, MTRCL completed the installation of the main section of the permanent footbridge at mid-night of 18 November 2018, and scheduled the re-provision of the remaining section of the permanent footbridge and the demolition of the associated temporary footbridge in 2019. To facilitate the relevant works, Convention Avenue would be temporarily closed for several nights. After the re-provisioning of underground box culvert and other utilities at Fleming Road, temporary traffic management measures would continue in stages at Wan Chai North, including Convention Avenue, Fleming Road, Expo Dive East,

etc. to facilitate the construction of the remaining stages of Exhibition Centre Station.

37. MTRCL discovered three wartime unexploded ordnance ("UXO") at the works sites of the SCL project on 27 January, 31 January and 10 May 2018. The first two locations (two UXOs) and the third location are the works site of the former Wan Chai Swimming Pool and the former Harbour Road Sport Centre respectively. The three UXOs were discovered by engineering site staff during excavation works in accordance with the prudent works procedures. With smooth excavation works, the current risk of encountering bombs at the sites of ex-Wan Chai Swimming Pool and ex-Harbour Road Sports Centre is greatly reduced. MTRCL would continue to adopt a prudent approach in the remaining excavation works with the presence of bomb risk at Fleming Road to ensure safety of the public and the engineering site staff. HyD requested MTRCL to assess the time and cost implications arising from the discovery of UXOs, and explore delay recovery measures to minimise the risk of project delays.

38. To deal with a left-in pipe pile located at Fenwick Pier Street, MTRCL's contractor had carried out grouting works in the vicinity of the abandoned pile to replace the construction of part of the diaphragm wall there. MTRCL also completed the construction of a flood protection wall at the western approach tunnel under the atrium of the convention centre to cope with possible flooding risk due to the changes in the continuous diaphragm walls as mentioned above. Subsequent to the completion of the excavation works at the concerned location, risk of flooding is significantly reduced and the structural works for tunnels was underway. MTRCL previously indicated that given the issue of the left-in pipe pile, there would be a further 3-month delay to the progress of the SCL and an increase in construction cost.

39. The details about the settlement monitoring points in Wan Chai North were presented at the special meeting of Subcommittee on Matters Relating to Railways on 31 August 2018. According to MTRCL's monitoring data at that time, the settlements of some monitoring points exceeded the third trigger level. MTRCL suspended the excavation works of Exhibition Centre Station on 10 August 2018 and confirmed the safety of buildings, structures and public facilities near the site of Exhibition Centre Station in accordance with the monitoring and reporting mechanism for the impact of the SCL railway project on nearby structures and public facilities announced by the Government on 28 September 2018. After the relevant departments accepted the revised trigger levels

proposed by MTRCL, the excavation works resumed on 29 September 2018. As the relevant excavation works is one of the major construction activities at Exhibition Centre Station, the works progress and the cost have thus been affected by the suspension of works during the period from 10 August to 28 September 2018.

40. According to MTRCL's monitoring data, the cumulative settlement of the affected facilities near Exhibition Centre Station, including buildings, public utilities and roads, does not exceed the pre-set or updated trigger levels. The updated pre-set trigger levels are listed in MTRCL's progress report. (Appendix 3 of **Annex 2**)

Conclusion

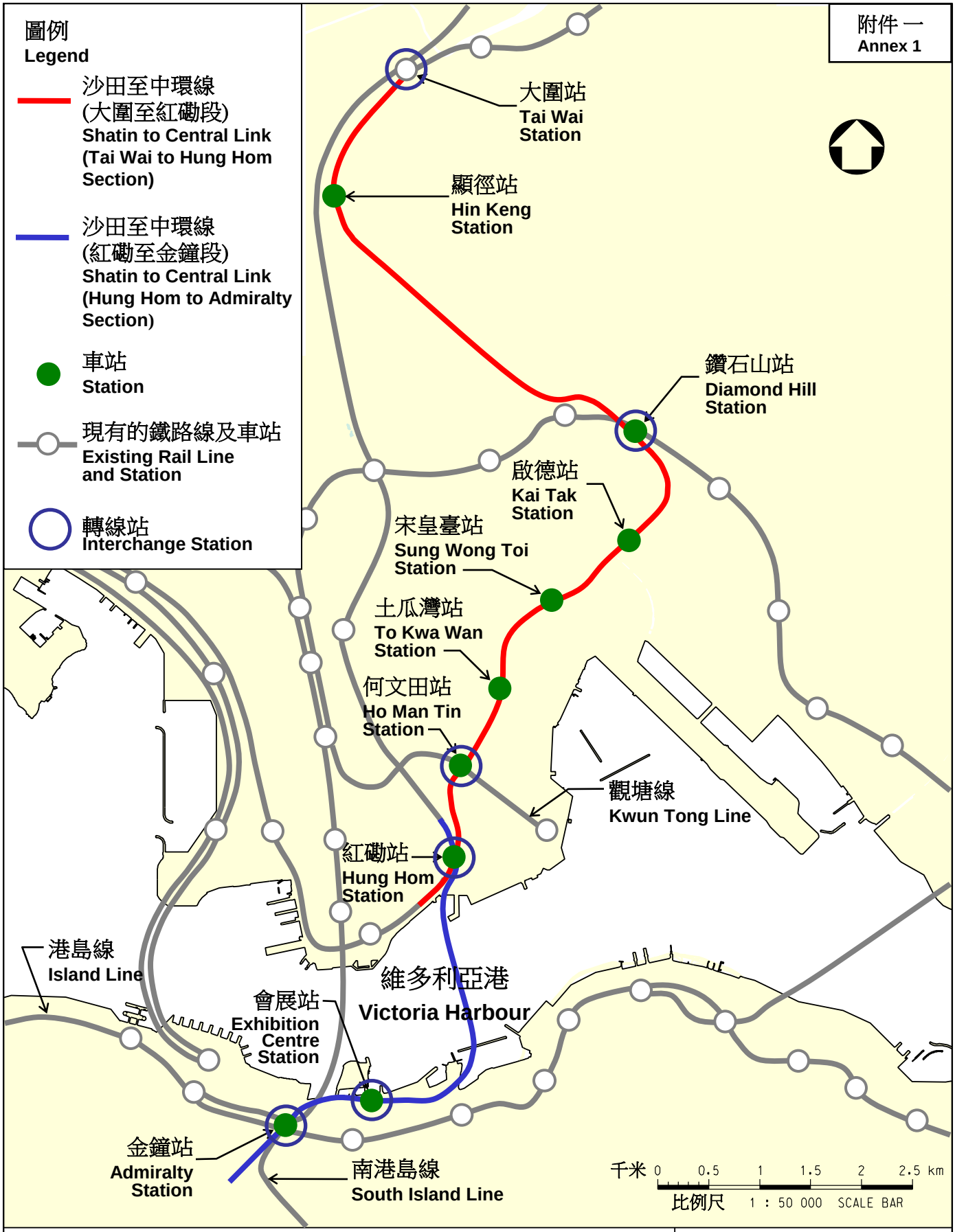
41. In view of the assessments as mentioned in paragraphs 9 to 40 above, taking into account the delay of about 11 months to the "Tai Wai to Hung Hom Section" of SCL arising from the archaeological works, archaeological discoveries and conservation options for archaeological features at Sung Wong Toi Station from 2012 to 2014, the commissioning date of "Tai Wai to Hung Hom Section" is deferred to end 2019. HyD has been coordinating and overseeing the construction of SCL. With the efforts of the construction team, the delay recovery measures implemented at the "Tai Wai to Hung Hom Section" is picking up the pace progressively. Hence, the target commissioning date of this section could originally be advanced to about mid-2019. However, due to the series of Hung Hom Station incidents and associated investigation works last year, the target commissioning date will need to be further reviewed.

42. On the need and the feasibility of partial commissioning of some stations and part of the Tai Wai to Hung Hom Section, MTRCL advised THB, its EAT and HyD that whether the options are feasible is mainly dependent on whether the timely approval of the relevant departments, including Buildings Department and Fire Services Department, could be obtained for the NAT and the railway signaling control rooms of Tuen Ma Line situated within Hung Hom Stabling Sidings, as mentioned above and in **Annex 6**. Besides, the partial commissioning options should take into account the technical feasibility to open part of the railway section, the capacity of the railway system, the modification to the signaling system, the compatibility of the road transport, etc. The Government and MTRCL will continue to study actively the suitable options and, in considering the

options, will accord priority to practicability and railway operational safety.

43. Given the impact of site handover arrangement under the WDII project, the complicated ground conditions below Exhibition Centre Station, the settlement issue leading to a suspension of the excavation works at the Exhibition Centre Station, as well as the allowance of flexibility for the construction of new convention facilities atop Exhibition Centre Station, the works progress of the Hung Hom to Admiralty Section have been affected. Yet, the target commissioning date remains to be 2021. HyD has requested MTRCL to proactively explore measures to recover the progress so as to minimize the risks on construction delay. We will continue to coordinate and oversee the construction of SCL so as to complete the works for commissioning the railway line as soon as possible.

Transport and Housing Bureau
Highways Department
January 2019



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.
HRWSCL003-SK0465

鐵路拓展處 RAILWAY DEVELOPMENT OFFICE

路政署
HIGHWAYS DEPARTMENT

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Annex 2

Legislative Council Panel on Transport
Subcommittee on Matters Relating to Railways

Progress Update of the Shatin to Central Link
(As at 31 December 2018)

INTRODUCTION

This report updates Subcommittee members on the progress of Shatin to Central Link ("SCL") as at 31 December 2018.

OVERVIEW OF THE SCL PROJECT

Works progress

Overall progress

2. As at 31 December 2018, the overall works for SCL were 89% complete compared to the planned completion rate of 95% against the original project completion target in 2018 for Tai Wai to Hung Hom Section and 2020 for Hung Hom to Admiralty Section respectively (Please refer to Enclosure II for details). As reported before, the construction works were previously affected by various factors, including the archaeological works at Sung Wong Toi Station site, late land handover in Wan Chai North, and complicated underground conditions. With the mitigation measures being implemented, some of the delay caused by the above factors could be recovered.

3. The target completion for Tai Wai to Hung Hom Section is dependent on the verification and safety test on Hung Hom Station platform referred in Paragraph 56 below. In light of the uncertainty of the results of the above verification and safety test, the government has requested the Corporation to carry out a feasibility study on opening the Tuen Ma Line ("TML") in phases. The study covers a number of complex technical and operational issues including the feasibility of making modifications to the signalling system, track design to accommodate train operation for phased opening, any consequential impacts on the services on existing railway lines and on full line opening. As the critical signalling equipment and related cabling covering all

stations along TML are located in the Hung Hom Station extension and its connecting structures, we need to carefully study the feasibility of relocating or rerouting the signalling equipment and cables.

4. As for the Hung Hom to Admiralty Section, we will endeavour to maintain the target completion in 2021 while ensuring safety at all times.

5. Around 99% of the works of the Tai Wai to Hung Hom Section have been completed as at 31 December 2018, compared to the originally planned completion rate of 100%. As at 31 December 2018, key progress include:

a. Statutory inspections for various stations and railway facilities are being conducted progressively; and

b. Testing of new trains and other railway systems are underway to facilitate the future operation of the TML.

6. Hung Hom to Admiralty Section was 76% complete in overall terms as at 31 December 2018, compared to the originally planned completion rate of 88%. Key progress include:

a. All Immersed Tube Tunnel ("IMT") units have been successfully installed in the vicinity of Causeway Bay Typhoon Shelter ("CBTS") in Victoria Harbour in April 2018 and connection works have been substantially completed; and

b. Reliability test of the newly installed signalling system is being carried out along the East Rail Line ("EAL") during non-service hours.

Progress in different sections

7. SCL comprises six sections according to geographical locations -

(i) Sha Tin Section;
(ii) Wong Tai Sin Section;
(iii) Kowloon City Section;
(iv) Hung Hom Section;
(v) Cross Harbour Section; and
(vi) Hong Kong Island Section.

(i) Sha Tin Section (Section of railway between Tai Wai Station and Ma Chai Hang in Wong Tai Sin)

8. Fitting out works, building services, electrical and mechanical ("E&M") equipment installation were substantially completed at Hin Keng Station. Statutory inspections on civil, E&M, building and fire services installation works for Hin Keng Station were completed. Other remaining system tests and statutory inspections for the trackside between Tai Wai and Kai Tak stations are in progress. The road resurfacing works on Che Kung Miu Road were also completed in December 2018.

9. For the tunnel section inside Lion Rock, overhead line fixing and E&M installation works were completed. Statutory inspections for tunnel E&M systems are in progress. The reinstatement of the works site at Hin Keng portal area of Lion Rock tunnels was substantially completed. As previously reported, because of the complicated geological conditions under the Hin Keng portal area of Lion Rock, the progress of tunnelling works was once behind the original schedule. The tunnel was broken through in November 2015 after adopting a number of mitigation measures, such as increase of blasting charge, re-sequencing of works procedures and adoption of alternative tunnel lining formwork design which have proved to be effective to recover the delay.

(ii) Wong Tai Sin Section (Section of railway between Ma Chai Hang and Kai Tak Station)

10. As previously reported, a substantial amount of clay materials was encountered during the first Tunnel Boring Machine ("TBM") drive from Diamond Hill to Ma Chai Hang which required additional cleaning and maintenance of the cutter head of TBM and more frequent changes of disc cutters. Changes to the disc cutter design and modification of cutter head and ancillary facilities were then adopted in the second drive which recovered some of the delay. TBM tunnel breakthrough was achieved in April 2016. Following the completion of track-laying works in March 2017, overhead line fixing and E&M installation works were completed in these tunnels.

11. At Ma Chai Hang, structural works, architectural builder's works and finishes ("ABWF"), the green roof for the ventilation building as well as landscaping works at the adjacent areas were completed.

12. The structural works and ABWF for Fung Tak Emergency Access

Point at the junction of Wong Tai Sin Road and Wong Tai Sin Temple Access Road were completed. The related statutory inspections were completed in December 2018.

13. The structural works for the adjacent Wong Tai Sin Public Transport Terminus ("PTT") were completed. ABWF and installation of noise barriers and street furniture including directional signage were completed. Statutory inspections for the PTT are targeted to commence in the first quarter of 2019. The design of the entrance / exit of lower deck of the PTT connected with Shatin Pass Road was revised as requested by relevant government departments. The corresponding temporary traffic management schemes are expected to be implemented in the third quarter of 2019. The electrical installations for coach parking area at the upper deck of the PTT will be revised to suit its operation and management arrangements, subject to relevant government departments' approval.

14. At Diamond Hill Station Extension, E&M and building services works and the construction of Emergency Vehicular Access were completed. Site formation for landscaping has also been substantially completed. All statutory inspections for Diamond Hill Station Extension are targeted to be completed in the first quarter of 2019.

15. The pedestrian subways connecting the existing Diamond Hill Station and its extension underneath Lung Cheung Road were completed. Reinstatement works for the carriageway of Lung Cheung Road were completed in November 2018.

16. Modification works continue at the existing Diamond Hill Station to facilitate its transformation into an interchange station for the existing Kwun Tong Line and the future TML. Pedestrian diversion is being implemented at the existing Entrance A2 in order to extend its structure to link up with the extension of the Station. The Entrance A2 after extension works is expected to be opened for public use in the second quarter of 2019, subject to the statutory inspections for the station. At the other end, the new structure connecting the existing Entrance B with the station extension was substantially completed.

17. Due to the construction of the Diamond Hill Station extension, two historical structures namely the former Royal Airforce Hanger and Old Pillbox were relocated and temporarily stored within the site area of Diamond Hill Station since 2013. To cater for the development plan coordinated by the Housing Department, the two historical structures were relocated to the future Water Feature Park of the Diamond Hill

Comprehensive Development Area Site. The original temporary storage area within the site area of Diamond Hill Station will be handed over to relevant government departments in two phases in the first and fourth quarters of 2019.

18. The improvement works of pedestrian facilities (including footbridges, covered walkways, lifts and escalators) in Tsz Wan Shan area, which was carried out as part of the project and entrusted to the Corporation by the Government, were all completed and opened for public use in October 2017.

19. For the tunnels between Diamond Hill and Kai Tak stations, trackside auxiliary and E&M installation works were completed and statutory inspections were close to completion.

(iii) Kowloon City Section (Section of railway between Kai Tak Station and Ho Man Tin Station)

20. Fitting out and E&M works at Kai Tak Station were substantially completed. Following the completion of fire services and building services inspections, the remaining statutory inspections will continue in the first quarter of 2019. The temporary footpaths connecting Kai Tak Station and the public roads in the vicinity were substantially completed. With coordination and consensus with relevant government departments, the temporary footpath connecting Muk On Street and Muk Yuen Street is targeted to be opened for public use around the time of Lunar New Year holidays while remaining touch up works will continue.

21. As mentioned in our previous reports, the archaeological works at Sung Wong Toi Station have once caused a delay of 11 months to the original programme of the Tai Wai to Hung Hom Section. A number of delay recovery measures in Kowloon City area have been implemented to recover some of the delays. For example, by re-sequencing the works procedures and adjusted the site management, the construction of station structure and removal of TBM launching shaft were carried out in the Sung Wong Toi Station site area simultaneously.

22. Due to previous archaeological discovery at Sung Wong Toi Station, the adit connecting Pak Tai Street could not be constructed according to the original plan. To identify a suitable alternative alignment for the construction of the adit, a separate archaeological survey is required. The license for archaeological survey was already granted in January 2019, and other preparation works such as temporary traffic

management schemes and excavation permit application are in progress. Archaeological survey is expected to commence in the first quarter of 2019. The survey will first be carried out at key locations i.e. the connecting ends at Pak Tai Street and the station. Depending on the findings, the survey area may be extended to confirm the feasibility of an alternative alignment.

23. To provide an interim connectivity to Sung Wong Toi Station upon the commission of Tai Wai to Hung Hom Section, a feasibility study for a temporary at-grade crossing between Tam Kung Road and Sung Wong Toi Road was conducted and the design has been circulated to relevant government departments for approval.

24. E&M, fitting out and building services works at all levels inside Sung Wong Toi Station were substantially completed. Fire services inspection was completed in December 2018. Other statutory inspections are scheduled for the first quarter of 2019. The remaining external finishing for the five station entrances are in progress.

25. The reinstatement works of the Nam Kok Road footpath is expected to be completed in the second quarter of 2019. Construction of footpaths connecting Sung Wong Toi Station and the public roads in the vicinity has commenced and is expected to be completed in the second quarter of 2019.

26. Internal fitting out and building services works at the emergency access shafts on Tam Kung Road and Chi Kiang Street were substantially completed.

27. E&M and building services works at all levels inside To Kwa Wan Station were substantially completed. Fire services inspection was completed in November 2018. Other statutory inspections have been scheduled for the first quarter of 2019. The remaining fitting out works inside the station and external finishing for the four station entrances at To Kwa Wan Market, Lok Shan Road, Kiang Su Street and Chi Kiang Street are in progress. Permanent reinstatement of the previously affected public utilities along Ma Tau Wai Road such as water mains, drainage and roads are being carried out in phases. Due to unforeseen factors arising during the works period such as the need for further enhancement of construction methods and temporary traffic management schemes on Ma Tau Wai Road and its vicinity, we expect that the roadworks along Ma Tau Wai Road will be completed in phases from second half of 2019 and substantial completion is expected to take place by the first quarter of

2020.

28. Remedial works for the non-compliance at an internal wall adjacent to two staircases near the platform level in To Kwa Wan Station are in progress, targeting to be completed by February 2019.

(iv) Hung Hom Section (Section of railway between Ho Man Tin Station and Hung Hom Station)

29. Under the SCL, two railway tunnels are being constructed north of Hung Hom Station to connect the existing EAL and WRL to form the cross-harbour EAL and TML respectively. Structural works and track-laying works of the tunnel connecting Ho Man Tin and Hung Hom stations were completed. For the tunnel connecting the existing EAL to the extension of Hung Hom Station to form the cross-harbour EAL, structural works, track works and E&M installation works were substantially completed.

30. While completion of all tunnel structures, all temporary traffic management schemes along Chatham Road North, Winslow Street underpass slip road as well as Hong Chong Road slip road were completed and re-opened for use. Reinstatement of Oi Sen Path walkway was also completed and opened for public use.

31. E&M works, building services and fitting out works for the two levels of new platforms built under the existing Hung Hom station podium were substantially completed for testing and commissioning works. Stage three modification works of the existing station to accommodate future station re-arrangements, including ABWF works, building services provisions, as well as new escalators and lifts installations were substantially complete.

32. Structural works, building services works, E&M works, track-laying and overhead line installation works of the stabling sidings at the former Hung Hom Freight Yard were completed and inspection on fire services installation was also completed in May 2018.

(v) Cross Harbour Section (Section of railway across Victoria Harbour)

33. To extend the existing EAL across Victoria Harbour to Hong Kong Island, a new cross-harbour rail tunnel is being built under the SCL project by the IMT method. All 11 IMT pre-cast units have been

immersed and installed in April 2018. The final connection works were substantially completed.

34. With the anticipated completion of marine works in CBTS by early 2019, moorings in CBTS will be reinstated in phases. The Corporation will continue to liaise with the Marine Department and relevant stakeholders to ensure that the mooring arrangement is well coordinated.

35. With the partial completion of the marine backfilling work for the installed IMT tunnel units, the Hung Hom Fairway has been restored to its original alignment since late October 2018. The remaining backfilling works are expected to be completed in the first quarter of 2019.

(vi) Hong Kong Island Section (Section of railway on Hong Kong Island ending at Admiralty Station)

36. All TBM tunnelling works from CBTS to Exhibition Centre Station and construction of the walkways and track bed along both up-track and down-track tunnels were completed.

37. At the works site of the former Police Officers' Club ("POC"), excavation works for constructing the ventilation building were completed and structural works for the building are underway. Foundation works and the subsequent bulk excavation for the reprovisioning of the POC basement were completed and the associated basement structural construction works are expected to be completed by early 2019.

38. At the Tunnel Approach Rest Garden near CBTS, reinstatement of the underground box culvert is on-going and underpinning of the Canal Road flyover was completed. Reinstatement of the rest area and recreational facilities has commenced in December 2018.

39. For the tunnel on the western side of Exhibition Centre Station, TBM "Athena" has completed the up-track and down-track tunnel boring drives between Fenwick Pier Street works site and Admiralty Station in 2017. During the course of works, "Athena" has successfully passed beneath the existing Tsuen Wan Line tunnels without any impact on the existing train service. Subsequent to the completion of TBM tunnelling works, the dismantling of the TBM was substantially completed in late March 2018. Following the completion of breakthrough works between the TBM tunnels and the SCL platforms at Admiralty Station, tunnel lining works were also completed.

40. In Wan Chai North area, construction works for Exhibition Centre Station and the relevant railway facilities are underway. Bulk excavation works are expected to complete in the first half of 2019. When the excavation reached closer to the former seabed level where there is a potential risk of discovering unexploded bombs, a particularised and controlled excavation with the additional precautionary measures has been adopted. Excavation works will continue to be conducted in a strictly controlled manner to uphold safety and to minimise risks.

41. At the original Sports Centre area, excavation has passed through the potential risk zone of bomb discovery in October 2018. As previously reported, the project team has encountered the challenge of the higher than expected rockhead level in this area. Blasting has once been considered as a remedial measure. Having considered the potential presence of wartime bomb in the vicinity, the rock excavation will continue to be carried out by mechanical breaking. While this might prolong the excavation programme with a risk of programme delay, the project team will continue to closely monitor the progress and formulate appropriate measures to minimise the possible programme impact.

42. At the Fleming Road site, diaphragm wall construction was completed and excavation is expected to pass through the potential risk zone in the first half of 2019.

43. For the works site on the reclamation area under the Wan Chai Development Phase II ("WDII") project, the Civil Engineering and Development Department handed over the relevant site in phases until January, February and July 2017, with the handover date of part of the works areas deferred by seven months.

44. As previously reported, the delayed handover of critical works areas and the need to allow flexibility for the convention facilities above Exhibition Centre Station has generated a delay of six months in the completion of Exhibition Centre Station.

45. Apart from these, the handover date of a parcel of land under the WDII project near Fenwick Pier Street has also been deferred for about four to six months. The sites concerned were handed over to the Corporation in phases up to March 2017 for the purpose of interfacing works at the Western Approach Tunnel of Exhibition Centre Station, as well as the tunnelling works to Admiralty Station.

46. As previously reported, a 40 meters long pipe pile was left on site underground within the parcel of land, which is in close proximity to other existing permanent foundation structures. In addition, the construction of the last section of a diaphragm wall cofferdam at this location which had been entrusted to WDII was not completed. As a result of these uncompleted works, the Corporation and its Contractor have to overcome these engineering challenges, which also entailed additional construction cost and a further delay of three months on top of the previously reported six months' delay.

47. After gaining access to the above-mentioned works site, the Corporation has carried out ground investigation works and detailed study on the construction method. As remedial measures, grouting works were carried out in the vicinity of the abandoned pile to replace the planned diaphragm wall, and further additional strengthening works will be required at a later stage. Excavation works at that location were completed in October 2018.

48. With regard to the discoveries of unexploded wartime bombs at the Exhibition Centre Station works site, as well as the temporary suspension of relevant excavation works for Exhibition Centre Station, the Corporation will further review the impacts of the incidents on works progress.

49. A 900-metre overrun tunnel will be extended southwards from the SCL platform at Admiralty Station for future train regulation. While 200-metre-long section of this overrun tunnel was completed by the SIL (East) project in 2015, drill and blast excavation of the remaining 700-metre-long section and tunnel lining works were completed in June 2017 and mid-March 2018 respectively. Tunnel internal structure works has been completed in June 2018 and building services works are on-going. The structural works of the Hong Kong Park Ventilation Building have commenced and expected to be completed in mid-2019.

50. The internal structural works, architectural finishes and building services installation works for the extended Admiralty Station are in progress.

QUALITY AND SAFETY OF SCL CONSTRUCTION WORKS

Measures taken to address the settlement issue adjacent to SCL stations

51. Safety and quality of railway projects have always been the top priorities of the Corporation and safety to the public and site workers had at no time been compromised. The Government has announced in September 2018 a notification mechanism on the monitoring of the structures and public facilities in the vicinity of the SCL works, with a view to providing timely information to the public when the monitoring data in relation to relevant structures and public facilities have reached the settlement trigger values. The Corporation will work closely with the Government in accordance with the mechanism.

52. Enclosure III shows the most recent information on the monitoring levels, the data at monitoring points where the pre-set trigger levels have been reached or exceeded, and where pre-set trigger levels for temporary suspension of works have been updated.

53. The excavation works for Exhibition Centre Station resumed in September 2018. Since then, all monitoring readings have not reached or exceeded the pre-set trigger levels. The project team will continue the works in a prudent manner with stringent monitoring over any impact on nearby structures and underground utilities to ensure safety. When settlement readings reach trigger level, appropriate follow-up actions will be taken.

54. For To Kwa Wan Station, Register Structural Engineers were deployed in the past few months to assess the safety conditions of the buildings which were reported to be affected by the settlement near the station works sites. The concerned buildings are confirmed to be safe.

55. In response to the concerns of owners of the residential buildings near the construction sites of To Kwa Wan Station regarding cracks found in their domestic units during construction period, a community care programme has been launched in January 2019 to provide financial support to these owners in carrying out the repair works. A professional building surveyor consultant was appointed to administer and manage the execution of the programme.

Platform slab of Hung Hom Station extension

56. As previously reported, inaccuracies have been found in the report submitted by the Corporation to the Government on 15 June 2018 in relation to the platform slab at the Hung Hom Station extension. The inaccuracies relate to the construction methodology of the top side of the platform slab. In order to provide assurance to the public's concerns, the

Corporation has engaged external consultants to develop a set of measures to test and verify the integrity of the platform slab. In December 2018, the Government has accepted the Corporation's holistic proposal with a staged approach to verify if the as-built conditions of the platform slabs are consistent with the latest design drawings received as well as the workmanship quality of the coupler connections.

57. Stage One of the staged approach, i.e. to compile the design amendment drawings and construction record, were substantially completed. Stage Two is on-site physical investigations by opening up a number of locations at the East West Corridor and North South Corridor slabs to examine the as-constructed condition of the East West Corridor at the connection with the diaphragm walls and the workmanship quality of both platform slabs and station structure. The opening-up works have started since 10 December 2018. Representatives of relevant government departments, their consultants and experts as well as the Police are present to ensure the tests are properly carried out according to the agreed procedures.

58. The verification test is ongoing and is proceeding according to the plan. The Highways Department has been providing regular updates on the latest results of the opening-up investigation on its website. Meanwhile, detailed data for all the coupler samples will be gathered for a holistic assessment on the overall structural integrity and safety of the Hung Hom Station Extension works under Stage Three of the holistic plan.

59. The Corporation also cooperates fully with the Commission of Inquiry as well as law enforcement agencies on their investigations on the diaphragm wall and the platform slab at the Hung Hom Station extension.

60. Meanwhile, the Corporation has recently received from the Contractor, Leighton Contractors (Asia) Limited ("Leighton"), the as-constructed drawings on construction works connecting to the Hung Hom Station, namely the North Approach Tunnel ("NAT") and South Approach Tunnel ("SAT"). The Corporation has issued Non-conformance Reports ("NCRs") to Leighton in respect of missing Request for Inspection and Survey Check ("RISC") forms relating to NAT and SAT in April 2018. To date, these RISC forms are still missing even after the as-constructed drawings have been received.

61. The Corporation is checking the as-constructed drawings against relevant construction, records and evidence (such as site photographs) and found gaps in the information which should have been submitted by the Contractor. Initial findings also show that while some couplers at certain construction joints can be seen in site photographs, they are not reflected in the latest as-constructed drawings submitted by Leighton. We are very disappointed with Leighton for the failing to keep and submit the required records, and reserve our legal rights to seek redress. The Corporation is in the process of checking the extent of shortfall and any problematic areas. We have been updating Government on the matter and will provide further detailed findings to Government once available. At the same time, Leighton is in the process of providing the as-constructed drawings on the Hung Hom Stabling Sidings ("HHS"). We will carry out verification of these drawings for the HHS once available.

Review by Capital Works Committee ("CWC")

62. In the meantime, the Capital Works Committee ("CWC") under the MTR's Board of Directors has been reviewing the Corporation's Project Integrated Management System (PIMS) and other related factors to provide recommendations on the improvement of SCL and future projects. The external consultant appointed by the CWC to undertake the review has submitted an interim report with a number of recommendations which the Board has accepted. The recommendations cover six aspects. While some of the recommendations are strategic in nature having long term implications on the organisation set-up and contract strategy for future projects, the Corporation has taken prompt actions for those short-to-medium term recommendations that can fulfil the continuing need of SCL in quality management.

63. In light of the recommendations, the Corporation will be implementing a number of measures by Q2 2019, including:

i. Strengthening project management processes & procedures
   - Introduce a specific Project Quality Management Plan document to act as a guide to the quality expectations within PIMS;
   - Establish a centrally administered Non-conformance Report ("NCR") database.

ii. Revamping the organisations responsible for maintaining oversight on quality
    - Strengthen the Quality Assurance (QA) Team through additional external recruitment and enhance governance by transferring the QA Team to an independent Division;
    - In the meantime, the strength and expertise of the team has been bolstered with seconded QA staff.

iii. Commercial & Contract Strategy
    - Record and trend-analyse a set of quality KPIs which may form the basis of any quality incentivisation scheme and allow quality performance to be systematically fed back to subsequent procurement process.

iv. People & Capability
    - Deliver specific training for quality management to MTRCL and contractors' site teams;
    - Introduce a system for issuing "Site Quality Alerts" and include "quality issues" in toolbox talks with an aim to monitor staff competence on site;

v. Quality Planning and Reporting
    - Review and enhance the planning for "hold point" and "quality control point" arrangements.

vi. Tools & Technology
    - Introduce digital smartphone applications, which have been procured, customised and are being tested at selected SCL contracts for capturing data of site-based communication as well as site supervision and inspection. The applications will be rolled out to all SCL live civil contracts to provide more robust traceability and governance.

TESTING OF NEW TRAINS AND OTHER RAILWAY SYSTEMS

64. To facilitate the future operation of the extension of EAL to Hong Kong Island, 37 sets of new trains are being delivered to Hong Kong in batches. Stringent testing and commissioning for the delivered new trains are underway at Ho Tung Lau Depot. Dynamic testing has been in progress at the existing EAL during non-service hours since December 2015. New trains are equipped with new features including dynamic route

map and gangway end display system. The locations of the doors of the new trains are also improved by being evenly spaced along the trains, bringing more convenience to passengers when alighting and boarding.

65. On the other hand, all 17 sets of new trains for TML have been delivered to Hong Kong in November 2018. Stringent testing and commissioning for the delivered new trains are underway at Pat Heung Depot and Tai Wai Depot.

66. Apart from the procurement of new trains, some of the existing train compartments on Ma On Shan Line ("MOL"), WRL and EAL are also undergoing modification and reconfiguration, together with the newly procured train cars to form the converted 8-car trains for the TML. The full fleet of 15 4-car MOL trains have already been upgraded to 8-car trains in December 2017 and the overall carrying capacity on the MOL has been doubled. The conversion of 7-car WRL trains to 8-car trains has also been completed in May 2018.

67. Following the earlier overhead line energisation between Tai Wai and Hung Hom Section, dynamic test of the new trains is being carried out on the section, as well as the existing WRL and MOL to facilitate the future operation of the TML. Reliability test of the new trains at various sections has also commenced since November 2018. Meanwhile, sectional integrated tests of other railway systems including signalling and passenger information systems are underway.

IMPROVEMENT WORKS FOR THE OPERATING RAILWAY FACILITIES

68. On the MOL, the retrofitting works of a total of 720 pairs of Automatic Platform Gate ("APG") at all 9 stations were completed in December 2017, which was a year ahead of the original plan.

69. The retrofitting of APGs will also be carried out for the EAL. Before the commencement of the retrofitting works, platforms have to be strengthened in advance and equipment rooms for the relevant signalling system and facilities have to be constructed. To avoid interrupting normal train services, most of the works can only be carried out overnight after normal train service hours. Platform strengthening works and construction of equipment rooms for the signalling and communication systems along the EAL have been substantially completed. Subsequent works including floor tiling and defect rectification are underway. On the

other hand, the locations of the doors of the existing trains and the new trains are different. In order to make the APGs along the EAL match with the new locations of the train doors, the retrofitting works will commence after the EAL is entirely operated by new trains.

70. As regards the replacement of 12-car trains with 9-car trains on the EAL, in view of passengers' concern on the carrying capacity of new trains, the new trains will be progressively launched upon the commissioning of Tai Wai to Hung Hom Section which will generate diversion effect. Hence, the installation programme of APGs will be aligned accordingly. To facilitate the future operation of new trains and APGs, the existing signalling system of the EAL has to be upgraded.

71. Since the EAL signalling replacement works commenced in the third quarter of 2015, the installation of the equipment in trains and at trackside along the EAL has been substantially completed. Dynamic test of the new signalling system has commenced by sections since October 2016 and has been extended to the full line of EAL in March 2018. The reliability test is now being carried out along the EAL and is expected to be completed in 2019. In the final stage of the reliability test, normal train operation patterns including that of peak period will be simulated at some nights to ensure a smooth operation of the new signalling system and trains in the future.

72. To avoid impact on day time train service, the signalling tests could only be conducted during non-service hours and hence may have some noise impact on residents nearby. The new trains were equipped with better noise-reduction features. During the tests, mitigation measures such as restriction of the number of trains in night test would be in place as appropriate to minimise the possible noise impacts as possible. The Corporation will continue to communicate with the residents nearby and keep them updated on the information about the night tests.

COSTS

Cost and expenditure

73. Since mid-2012, 28 major civil and 30 major electrical & mechanical ("E&M") contracts[1], together with other minor contracts,

[1] Major civil contract/E&M contract refers to any individual contract with value above $50 million, and includes Contract 11227 with a value of $49.8 million.

have been awarded with a total sum of $57.730 billion. The contract sums for civil works and E&M works are about $43.828 billion and $13.902 billion respectively (Please refer to Enclosure I)

74. Under the Entrustment Agreement for the SCL, the Government of the Hong Kong Special Administrative Region ("the Government") is responsible for funding the construction of the SCL.

Cost control mechanism

75. The Corporation attaches great importance to the monitoring and cost control of railway projects. The Corporation has a robust governance framework and a set of stringent procedures governing procurement, contract administration and cost control of its projects, be it an ownership project or a concession project.

76. Under the Entrustment Agreements for concession projects, the Corporation is obliged to use the same management system and procedures that are applicable to all other MTR projects. For concession projects like the SCL project, there is also an independent rigorous monitoring and verification system in place conducted by the concerned Government authority and its consultants in addition to the Corporation's contract management and control procedure.

77. To enhance the control of expenditure, the Corporation has set up the Project Control Group ("PCG") as a gate keeper, to scrutinise the assessments of variations and claims arising from consultancies and works contracts under the SCL project. Representatives from the Railways Development Office of Highways Department are invited to attend the PCG meetings.

78. Where the progress of works has been delayed, the Corporation would consider implementing delay recovery measures as appropriate. The proposals of delay recovery measures including the cost and benefits implications are required to be reviewed and approved by PCG.

Latest estimate of Cost to Complete ("CTC")

79. In December 2017, the Corporation announced that the detailed review of the estimated CTC for the main construction works of SCL has completed. Taking into account a number of factors, and based on the revised programme to complete the "Tai Wai to Hung Hom Section' and

"Hung Hom to Admiralty Section" in mid-2019 and 2021 respectively, the Corporation has increased the latest estimate of the entrustment cost of the main works by $16.5 billion from $70.8 billion to $87.3 billion. The latest estimate and supplementary information were submitted to the Government for its review, while the Corporation will provide any further information required.

STAKEHOLDER COMMUNICATION AND ENGAGEMENT

80. Most of the SCL works sites are in urban areas and close to local communities. We attach great importance to maintain close communication and engagement with the local communities and relevant stakeholders, in order to keep them informed of the works progress and to listen to their views. Apart from the regular progress updates to the Subcommittee members and respective District Councils, Community Liaison Groups, which have been set up across districts, is another major communication channel with the local communities where regular updates about SCL are provided. Newsletters, leaflets and notices about the works are distributed to the local communities. The SCL Information Centre in To Kwa Wan has also handled over 1,300 enquiries since October 2012. With the works for Tai Wai to Hung Hom Section approaching completion, the service of this SCL Information Centre has been terminated in end December 2018. Meanwhile, dedicated MTR and Contractors' Hotlines are available for handling enquiries and complaints in relating to the project.

EMPLOYMENT OPPORTUNITIES

81. As at 31 December 2018, about 3,325 construction workers and technical / professional staff members are employed for the SCL project, which in general could meet the labour requirement as the project has passed its construction peak. Nevertheless, for a sustainable development of the construction industry, the Corporation will continue the "SCL Contractors Cooperative Training Scheme" to attract new blood to join the construction industry. Under the Scheme, all SCL civil works contracts require contractors to recruit a specified amount of trainees. Training and internship programmes are provided to the trainees by the contractors of SCL and the Construction Industry Council. After passing relevant trade tests, the graduates would be offered a minimum 12-month employment contracts on the SCL. So far, the scheme has provided

training to 764 trainees with 520 having completed the trade test and continuing their careers in the field.

CONCLUSION

82. Members are invited to note the above information.

MTR Corporation Limited
January 2019

Enclosure I

Expenditure report as at 31 December 2018

Table 1 – Situation of expenditure

	Awarded contract sum for the contracts **($ million)**	**Cumulative expenditure of awarded contracts** **($ million)**	**Estimated amount of unresolved claims*** **($ million)**
Civil works	43,828.1	43,123.8	2,022.4
E&M works	13,901.8	6,213.8	1,206.6
Total	**57,729.9**	**49,337.6**	**3,229.0**

* The estimated amount of unresolved claim: Amount claimed ($4,364.5 million) – Interim award ($1,135.5 million) = $3,229.0 million (See Table 2)

Enclosure I

Table 2 – Situation of substantiated claims

	Claims resolved			**Claims unresolved**		
	Number	Amount claimed ($ million)	Amount awarded ($ million)	Number	Amount claimed ($ million)	Interim award ($ million)
Civil works	301	3,039.2	1,780.8	541	2,798.7	776.3
E&M works	9*	0	0	141	1,565.8	359.2
Total	**310**	**3,039.2**	**1,780.8**	**682**	**4,364.5**	**1,135.5**

** The claims only involved extension of time without cost implication.*

1. The Government and the Corporation conducted risk assessment at the planning and budgeting stages of the project to minimise claims arising from the works. Nevertheless, there were often unforeseeable situations in the course of works. For instance, the foundation or excavation works might come across a larger amount of or more complicated obstructions than expected. As this would add difficulties to the works, the contractors might have to use more machines or switch to other machines that were more suitable and employ more staff to cope with these situations. The contractors would submit claims in accordance with the contract terms to cover the additional expenditures. Upon receipt of claims from contractors, the corporation would examine such claims and assess the amount concerned based on the relevant contract terms, justifications, documents, records, etc.

2. As at 31 December 2018, the Corporation received 992 substantiated claims and the amount claimed in total was about $7,403.7 million, representing 12.8% of the awarded contract sum for the contracts. The Corporation has been discussing the details of the claims with the contractors concerned, and would thoroughly assess the amount claimed. The Corporation would process each claim in a prudent manner, and the contractors would have to

provide sufficient justifications and information. As at 31 December 2018, 310 cases were resolved and about $1,780.8 million was awarded, representing about 3.08% of the awarded contract sum for the contracts. Having regard to the needs of individual works and progress of the relevant assessment and discussion, interim award amounting to about $1,135.5 million was made for some cases.

Enclosure II

Overall works progress of the SCL as at 31 December2018

Overall works completed：89%

Percentage completed as originally planned [(1)]: 95%

(A) Cumulative progress of 28[(2)] major civil contracts awarded：

Contract No.	Contract Name	Percentage completed
1101	Modification of Ma On Shan Line	100%
1102	Hin Keng Station and Approach Structures	100%
1103	Hin Keng to Diamond Hill Tunnels and Fung Tak Public Transport Interchange	100%
1106	Diamond Hill Station Extension	99%
1107	Diamond Hill to Kai Tak Tunnels	100%
1108	Kai Tak Station and Associated Tunnels	100%
1108A	Kai Tak Barging Point Facilities	100%
1109	Stations and Tunnels of Sung Wong Toi and To Kwa Wan stations	99%
1111	Hung Hom North Approach Tunnels	100%
1112	Hung Hom Station and Stabling Sidings	99%
1113	Reprovisioning of New Territories South Animal Management Centre and Shatin Plant Quarantine Station	100%
1114	Pedestrian Links at Tsz Wan Shan	100%
1117	Pat Heung Depot Modification Works	100%
1119	Trackwork and Overhead Line Modification Works at Lo Wu and PHD	100%
1120	Trackwork and Overhead Line for SCL Phase 1	100%
1120B	Trackwork and Overhead Line for SCL Phase 2	36%
1121	EAL Cross Harbour Tunnels	97%
1122	Admiralty South Overrun Tunnel	91%
1123	Exhibition Centre Station and Western Approach Tunnel	69%

1124	Admiralty SCL Related Works	55%
1125	Police Sports and Recreation Club Enhancement Works	100%
1126	Reprovisioning of Harbour Road Sports Centre and Wan Chai Swimming Pool	100%
1128	South Ventilation Building to Admiralty Tunnels	82%
1129	SCL - Advance Works for Cross-harbour EAL	100%
11209	Platform Modification and Associated Works at EAL	100%
11227	Advance Works for EAL Cross Harbour Tunnels	100%

Note:

(1) The original programme is to commission the Tai Wai to Hung Hom Section and the Hung Hom to Admiralty Section in December 2018 and December 2020 respectively.

(2) The 28 awarded major civil contracts as mentioned in Paragraph 73 of this report include Contract 11230 and 11241. Contract 11230 is a tenancy agreement for the Joint Site Office for Contracts 1123 and 1128, and it is part of the project cost for Contracts 1123 and 1128. Contractor 11241 is the archaeological survey for connection to Pak Tai Street. As these two contracts involve no civil construction works, they are not included in the table above.

(B) Cumulative progress of 30 major E&M contracts awarded：

Contract No.	Contract Name	Percentage completed
1141A	New Rolling Stock for SCL Phase 1	99%
1141B	New Rolling Stock for SCL Phase 2	64%
1151	Rolling Stock Modification and New Train Cars for SCL Phase 1	100%
1152	Signalling System for SCL Phase 1 & Signalling System Modification for MOL and WRL	99%
1152B	Signalling System for SCL Phase 2	80%
1153	Tunnel ECS for SCL Phase 1	100%
1153B	Tunnel ECS for SCL Phase 2	47%
1154	Platform Screen Doors for SCL Phase 1 & APG Retrofit for MOL	100%
1154B	Platform Screen Doors for SCL Phase 2 & APG Retrofit for EAL	41%
1155	Power Supply System and Trackside Auxiliaries for SCL Phase 1	100%
1155B	Power Supply System and Trackside Auxiliaries for SCL Phase 2	56%
1159	Lifts for SCL Phase 1	98%
1162	TETRA System for SCL Phases 1 & 2	98%
1162B	Radio Distribution Network System for SCL Phases 1 & 2	75%
1163	AFC System and SAM System for SCL Phases 1 & 2	77%
1164	Building Services for Diamond Hill Station	99%
1164B	Building Services for SCL Hong Kong Island Section	21%
1165	Building Services for Hin Keng Station, Ma Chai Hang Ventilation Building and Fung Tak Emergency Access	100%
1166	Main Control System for SCL Phase 1	99%
1166B	Main Control System for SCL Phase 2	70%
1169	Communications System for SCL Phase 1	99%
1169B	Communications System for SCL Phase 2	30%

1172	Escalators for SCL Phase 1	99%
1172B	Lift and Escalators for SCL Phase 2	24%
1173	Building Services for Hung Hom Station and Hung Hom Stabling Sidings	96%
1175	Building Services for Kai Tak Station	100%
1176	Building Services for Sung Wong Toi Station and Ancillary Building	99%
1177	Building Services for To Kwa Wan Station and Ancillary Building	99%
1183	EAL Signalling System Modification	100%
1191	Floodgate System for SCL Phase 2	53%

Enclosure III

The Latest Updated Pre-set Trigger Levels

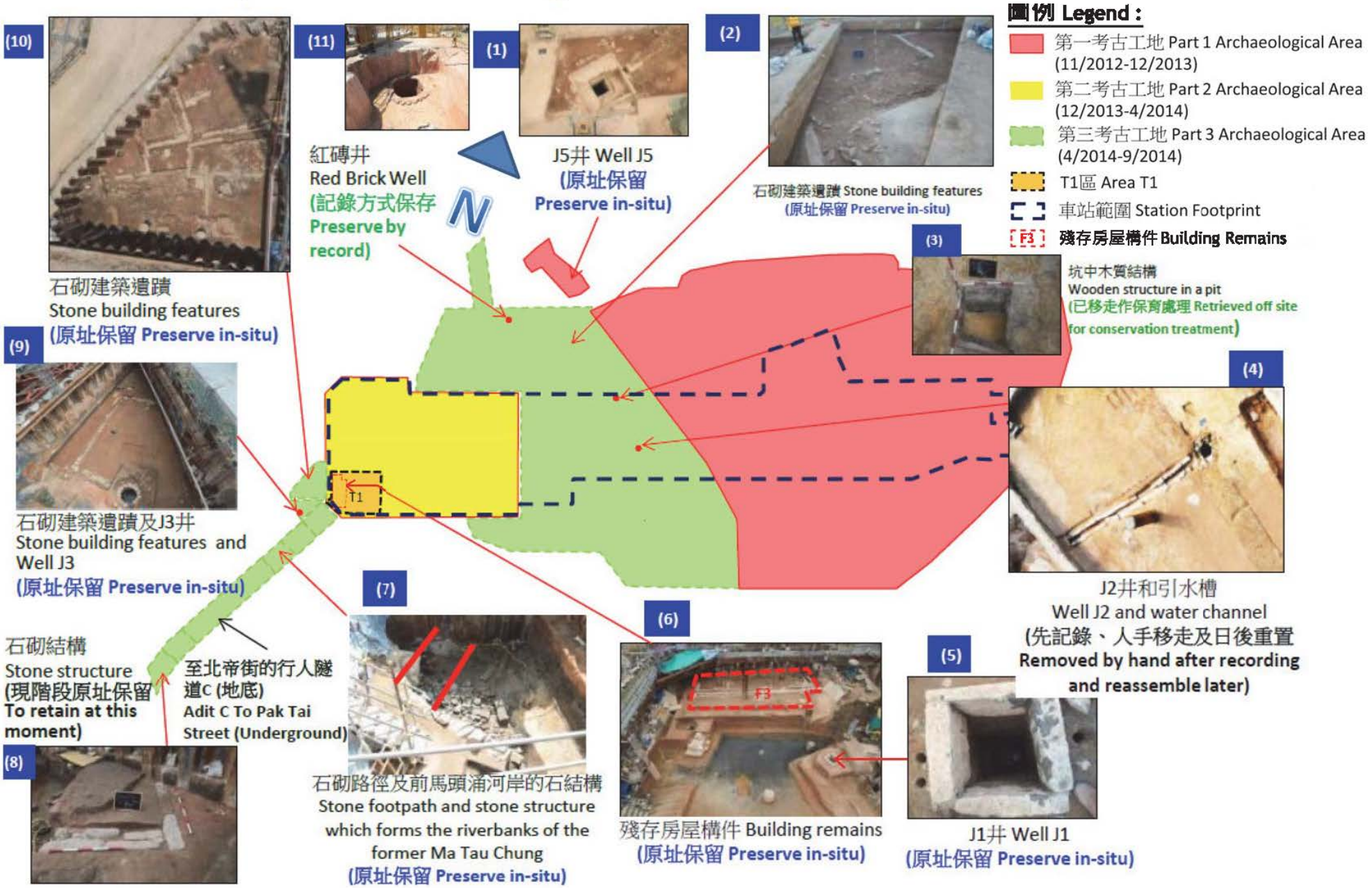
	Monitoring Point	Type	Settlement Readings (mm)	Latest pre-set trigger levels (mm)
1. Exhibition Centre Station and Western Approach Tunnel (Readings as at December 2018)				
1	1123-AE-USM(FW)-05-A	Water main	-3.7	-90
2	1123-Z4-USFV(FW)-05-B	Water main	-7.8	-70
3	1123-Z4-USFV(FW)-06-B	Water main	-8.4	-50

Remarks: The number of active monitoring points changed as the construction progressed. Monitoring of some settlement points may have stopped due to a variety of reasons such as after the structure has already been demolished or when the tunnel excavation works-front has already moved far away.

宋皇臺 站工地考古文物保育方案

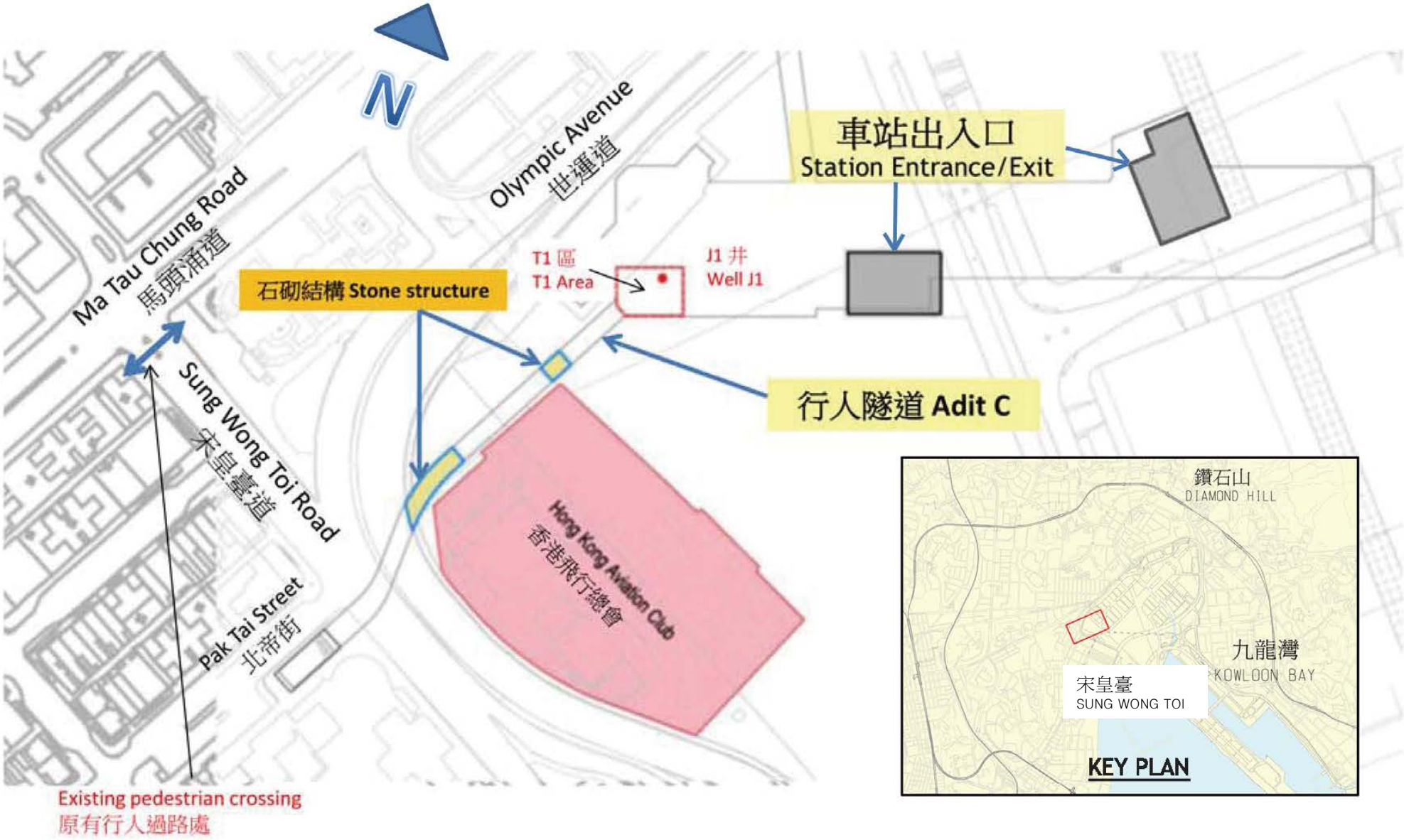
附件三 Annex 3

Conservation Options for Archaeological Features Discovered at Sung Wong Toi Station



行人隧道 C 的走線
Alignment of Adit C

附件四 Annex 4



Annex 5

Holistic Assessment Strategy for Hung Hom Station Extension Stage 2 Investigation - Results of Verification of Workmanship Quality for Coupler Connections

According to the holistic assessment strategy of MTR Corporation Limited (MTRCL) regarding the platform slabs and diaphragm walls of the Hung Hom Station Extension under the Shatin to Central Link (SCL) Project accepted by the Government on 5 December 2018, the MTRCL proceeded to commence the relevant work on 10 December. The first purpose of opening up the concrete is to carry out physical investigation at locations with gaps in the documentation, so as to verify the as-constructed conditions of the connections between the platform slabs and diaphragm walls. The second purpose is that, in view of the allegations on the cutting-short of steel bars, the MTRCL needs to open up certain connections between the platform slabs and diaphragm walls for detailed inspection, and to conduct non-destructive tests to verify the works quality of the coupler connections. The locations of opening-up were randomly selected based on a statistical approach.

According to the information from the coupler's supplier, proper installation requirements of coupler are:
(1) there shall be a maximum of two full threads exposed; and
(2) the embedded length of the threaded steel bar inside the coupler shall be at least 40 millimetres.

The contractor may use Type B Reinforcement bars at some locations. Type B reinforcement bars have 22 threads, in which case the installation requirement of coupler will be a maximum of twelve full threads exposed.

The MTRCL uses the phased array ultrasonic test to verify the embedded length of the threaded steel bar inside the coupler. As the allowable measurement tolerance of the test is 3 millimetres, equipment readings below 37 millimetres are regarded as failure in meeting the requirement. The test is carried out by the professional technicians of A.E.S. Destructive and Non-Destructive Testing Limited.

The coupler test results conducted by the MTRCL are given below:

Test Results of Couplers Exposed for the First Purpose (As at 28 January 2019)

Coupler No.	Location of Coupler Tested	No. of Exposed Thread	Embedded Length - Preliminary Results (millimetres) (Remark 1)	Embedded Length – Formal Test Report (millimetres) (Remark 2)
EWL-E44-TT-T1-01-C1	At the top of Area B of East West	1-2	31.61	31.61

	Line (EWL) slab near eastern diaphragm wall			
EWL-E44-TT-T1-02-C1	At the top of Area B of EWL slab near eastern diaphragm wall	9-10 (Remark 4)	6.22	6.22
EWL-E32-TT-T1-01-C1	At the top of Area Hong Kong Coliseum (HKC) of EWL slab near eastern diaphragm wall	0-1	36.65	36.65
EWL-E32-TT-T1-02-C1	At the top of Area HKC of EWL slab near eastern diaphragm wall	0-1	42.02	42.02
EWL-E32-TT-T1-03-C1	At the top of Area HKC of EWL slab near eastern diaphragm wall	0-1	41.51	41.51
EWL-E35-TT-T1-01-C1	At the top of Area HKC of EWL slab near eastern diaphragm wall	0	47.01	47.01
EWL-E35-TT-T1-02-C1	At the top of Area HKC of EWL slab near eastern diaphragm wall	0-1	45.70	45.70
EWL-E35-TT-T1-03-C1	At the top of Area HKC of EWL slab near eastern diaphragm wall	0-1	43.45	43.45
EWL-E37-TT-T1-01-C1	At the top of Area HKC of EWL slab near eastern diaphragm wall	1-2	39.84	39.84
EWL-E37-TT-T1-02-C1	At the top of Area HKC of EWL slab near eastern diaphragm wall	1-2	42.51	42.51
EWL-E46-TT-T1-01-C1	At the top of Area B of EWL slab	0-1	44.04	44.04

	near eastern diaphragm wall			
EWL-E46-TT-T1-02-C1	At the top of Area B of EWL slab near eastern diaphragm wall	2-3	33.00	33.00
EWL-E72-BT-T1-01-C1	At the top of Area C1 of EWL slab near eastern diaphragm wall	0-1	36.39	36.39
EWL-E72-BT-T1-02-C1	At the top of Area C1 of EWL slab near eastern diaphragm wall	0-1	36.88	36.88
EWL-E33-TT-T1-01-C1	At the top of Area HKC of EWL slab near eastern diaphragm wall	0-1	45.43	To be provided by MTRCL
EWL-E33-TT-T1-02-C1	At the top of Area HKC of EWL slab near eastern diaphragm wall	0	40.10	To be provided by MTRCL
EWL-E36-TT-T1-01-C1	At the top of Area HKC of EWL slab near eastern diaphragm wall	0-1	41.61	To be provided by MTRCL
EWL-E36-TT-T1-02-C1	At the top of Area HKC of EWL slab near eastern diaphragm wall	0-1	45.26	To be provided by MTRCL

Test Results of Couplers Exposed for the Second Purpose
(As at 28 January 2019, the latest information is highlighted in blue)

Coupler No.	**Location of Coupler Tested**	**No. of Exposed Thread**	**Embedded Length - Preliminary Results (millimetres)** (Remark 1)	**Embedded Length – Formal Test Report (millimetres)** (Remark 2)
EWL-E46-BB-B1-01-C1	At the bottom of Area B of EWL	2-3	34.91	34.91

	slab near eastern diaphragm wall			
EWL-E46-BB-B1-02-C1	At the bottom of Area B of EWL slab near eastern diaphragm wall	3-4	29.65	29.65
EWL-E46-BB-B1-03-C1	At the bottom of Area B of EWL slab near eastern diaphragm wall	2-3	34.32	34.32
EWL-E70-BB-B1-01-C1	At the bottom of Area C1 of EWL slab near eastern diaphragm wall	2-3	40.51	40.51
EWL-E70-BB-B1-02-C1	At the bottom of Area C1 of EWL slab near eastern diaphragm wall	1-2	36.78	36.78
EWL-E40-TT-T1-01-C1	At the top of Area B of EWL slab near eastern diaphragm wall	9-10 (Remark 3)	39.21	39.21
EWL-E40-TT-T1-02-C1	At the top of Area B of EWL slab near eastern diaphragm wall	10-11 (Remark 3)	40.81	40.81
EWL-E40-TT-T1-03-C1	At the top of Area B of EWL slab near eastern diaphragm wall	11-12 (Remark 3)	38.57	38.57
EWL-E65-BB-B1-01-C1	At the bottom of Area C1 of EWL slab near eastern diaphragm wall	0	42.43	42.43
EWL-E107-BB-B1-01-C1	At the bottom of Area C3 of EWL slab near eastern diaphragm wall	0	35.34	35.34
EWL-E107-BB-B1-02-C1	At the bottom of Area C3 of EWL slab near eastern diaphragm wall	6-7	9.40	9.40

EWL-E107-BB-B1-03-C1	At the bottom of Area C3 of EWL slab near eastern diaphragm wall	0	40.91	40.91
EWL-E90-BB-B1-01-C1	At the bottom of Area C2 of EWL slab near eastern diaphragm wall	0	41.43	41.43
EWL-E90-BB-B1-02-C1	At the bottom of Area C2 of EWL slab near eastern diaphragm wall	0	43.82	43.82
EWL-E90-BB-B1-03-C1	At the bottom of Area C2 of EWL slab near eastern diaphragm wall	0	43.85	43.85
EWL-E50-BB-B1-01-C1	At the bottom of Area B of EWL slab near eastern diaphragm wall	0	34.80	34.80
EWL-E77-BB-B1-01-C1	At the bottom of Area C2 of EWL slab near eastern diaphragm wall	0	45.22	45.22
EWL-E96-BB-B1-01-C1	At the bottom of Area C3 of EWL slab near eastern diaphragm wall	0	42.02	42.02
EWL-E112-BB-B1-02-C1	At the bottom of Area C3 of EWL slab near eastern diaphragm wall	0	48.72	48.72
EWL-W58-BB-B1-01-C1	At the bottom of Area C1 of EWL slab near western diaphragm wall	0-1	40.04	40.04
EWL-W58-BB-B1-02-C1	At the bottom of Area C1 of EWL slab near western diaphragm wall	0	45.85	45.85
EWL-W58-BB-B1-03-C1	At the bottom of Area C1 of EWL	0-1	39.22	39.22

	slab near western diaphragm wall			
NSL-E68-TT-T1-01-C1	At the top of Area C1 of North South Line (NSL) slab near eastern diaphragm wall	0	39.38	39.38
NSL-E68-TT-T1-02-C1	At the top of Area C1 of NSL slab near eastern diaphragm wall	1-2	40.07	40.07
NSL-E80-TT-T1-01-C1	At the top of Area C2 of NSL slab near eastern diaphragm wall	0	38.01	38.01
NSL-E80-TT-T1-02-C1	At the top of Area C2 of NSL slab near eastern diaphragm wall	0-1	38.33	38.33
NSL-E80-TT-T1-03-C1	At the top of Area C2 of NSL slab near eastern diaphragm wall	0	36.36	36.36
EWL-W112-BB-B1-01-C1	At the bottom of Area C3 of EWL slab near western diaphragm wall	3-4	28.54	28.54
EWL-W112-BB-B1-02-C1	At the bottom of Area C3 of EWL slab near western diaphragm wall	2-3	34.99	34.99
EWL-W112-BB-B1-03-C1	At the bottom of Area C3 of EWL slab near western diaphragm wall	1-2	35.32	35.32
EWL-E115-BB-B1-01-C1	At the bottom of Area C3 of EWL slab near eastern diaphragm wall	0	40.78	40.78
EWL-E115-BB-B1-02-C1	At the bottom of Area C3 of EWL slab near eastern diaphragm wall	0	42.02	42.02

NSL-E29-TT-T1-01-C1	At the top of Area HKC of NSL slab near eastern diaphragm wall	0-1	38.09	38.09
NSL-E29-TT-T1-02-C1	At the top of Area HKC of NSL slab near eastern diaphragm wall	0	49.06	49.06
NSL-E29-TT-T1-03-C1	At the top of Area HKC of NSL slab near eastern diaphragm wall	0-1	44.05	44.05
EWL-W68-BB-B1-01-C1	At the bottom of Area C1 of EWL slab near western diaphragm wall	1-2	35.45	35.45
EWL-W68-BB-B1-02-C1	At the bottom of Area C1 of EWL slab near western diaphragm wall	1-2	34.70	34.70
EWL-W68-BB-B1-03-C1	At the bottom of Area C1 of EWL slab near western diaphragm wall	1-2	37.58	37.58
EWL-W78-BB-B1-01-C1	At the bottom of Area C1 of EWL slab near western diaphragm wall	1-2	37.46	37.46
EWL-W78-BB-B1-02-C1	At the bottom of Area C1 of EWL slab near western diaphragm wall	1-2	36.42	36.42
EWL-W78-BB-B1-03-C1	At the bottom of Area C1 of EWL slab near western diaphragm wall	1-2	39.05	39.05
EWL-W78-BB-B1-04-C1	At the bottom of Area C1 of EWL slab near western diaphragm wall	2-3	37.66	37.66
EWL-W84-BB-B1-01-C1	At the bottom of Area C2 of EWL	0	33.98	33.98

	slab near western diaphragm wall			
EWL-W84-BB-B1-02-C1	At the bottom of Area C2 of EWL slab near western diaphragm wall	1-2	32.59	32.59
EWL-W84-BB-B1-03-C1	At the bottom of Area C2 of EWL slab near western diaphragm wall	1-2	36.80	36.80
EWL-W115-BB-B1-01-C1	At the bottom of Area C3 of EWL slab near western diaphragm wall	1-2	44.66	44.66
EWL-W91-BB-B1-01-C1	At the bottom of Area C2 of EWL slab near western diaphragm wall	2-3	32.97	32.97
EWL-W91-BB-B1-02-C1	At the bottom of Area C2 of EWL slab near western diaphragm wall	2-3	34.66	34.66
EWL-W91-BB-B1-03-C1	At the bottom of Area C2 of EWL slab near western diaphragm wall	2-3	37.77	37.77
NSL-E38-TT-T1-01-C1	At the top of Area HKC of NSL slab near eastern diaphragm wall	0-1	41.29	41.29
NSL-E38-TT-T1-02-C1	At the top of Area HKC of NSL slab near eastern diaphragm wall	0	40.40	40.40
NSL-E38-TT-T1-03-C1	At the top of Area HKC of NSL slab near eastern diaphragm wall	0	42.18	42.18
NSL-W73-TT-T1-01-C1	At the top of Area C1 of NSL slab near western diaphragm wall	1-2	32.91	32.91

NSL-W73-TT-T1-02-C1	At the top of Area C1 of NSL slab near western diaphragm wall	2-3	35.36	35.36
NSL-W73-TT-T1-03-C1	At the top of Area C1 of NSL slab near western diaphragm wall	1-2	32.42	32.42
EWL-W129-BB-B1-01-C1	At the bottom of Area C3 of EWL slab near western diaphragm wall	1-2	40.00	40.00
EWL-W129-BB-B1-02-C1	At the bottom of Area C3 of EWL slab near western diaphragm wall	0-1	38.67	38.67
EWL-W133-BB-B1-02-C1	At the bottom of Area C3 of EWL slab near western diaphragm wall	1-2	28.79	28.79
EWL-W136-BB-B1-01-C1	At the bottom of Area C3 of EWL slab near western diaphragm wall	1-2	33.92	33.92
EWL-W136-BB-B1-02-C1	At the bottom of Area C3 of EWL slab near western diaphragm wall	1-2	40.58	40.58
EWL-W136-BB-B1-03-C1	At the bottom of Area C3 of EWL slab near western diaphragm wall	1-2	35.49	35.49
NSL-W25-TT-T1-01-C1	At the top of Area HKC of NSL slab near western diaphragm wall	0	38.46	38.46
NSL-W25-TT-T1-02-C1	At the top of Area HKC of NSL slab near western diaphragm wall	0	39.02	39.02
NSL-W33-TT-T1-01-C1	At the top of Area HKC of NSL slab	0-1	40.84	40.84

	near western diaphragm wall			
NSL-W114-TT-T1-01-C1	At the top of Area C3 of NSL slab near western diaphragm wall	0	44.17	44.17
NSL-W127-TT-T1-01-C1	At the top of Area C3 of NSL slab near western diaphragm wall	1-2	37.73	37.73
EWL-E65-BB-B1-02-C1	At the bottom of Area C1 of EWL slab near eastern diaphragm wall	0-1	45.19	To be provided by MTRCL
EWL-E65-BB-B1-03-C1	At the bottom of Area C1 of EWL slab near eastern diaphragm wall	0-1	42.83	To be provided by MTRCL
EWL-E70-BB-B1-03-C1	At the bottom of Area C1 of EWL slab near eastern diaphragm wall	0	42.66	To be provided by MTRCL
EWL-E77-BB-B1-02-C1	At the bottom of Area C2 of EWL slab near eastern diaphragm wall	0	46.45	To be provided by MTRCL
EWL-E77-BB-B1-03-C1	At the bottom of Area C2 of EWL slab near eastern diaphragm wall	1-2	37.22	To be provided by MTRCL
EWL-E96-BB-B1-02-C1	At the bottom of Area C3 of EWL slab near eastern diaphragm wall	0	39.52	To be provided by MTRCL
EWL-E96-BB-B1-03-C1	At the bottom of Area C3 of EWL slab near eastern diaphragm wall	0	41.93	To be provided by MTRCL
EWL-E97-BB-B1-02-C1	At the bottom of Area C3 of EWL slab near eastern diaphragm wall	0-1	36.69	To be provided by MTRCL

EWL-E97-BB-B1-03-C1	At the bottom of Area C3 of EWL slab near eastern diaphragm wall	0	42.61	To be provided by MTRCL
EWL-E112-BB-B1-03-C1	At the bottom of Area C3 of EWL slab near eastern diaphragm wall	0	44.82	To be provided by MTRCL
EWL-E112-BB-B1-04-C1	At the bottom of Area C3 of EWL slab near eastern diaphragm wall	0	43.45	To be provided by MTRCL
EWL-E115-BB-B1-03-C1	At the bottom of Area C3 of EWL slab near eastern diaphragm wall	0-1	39.66	To be provided by MTRCL
EWL-E50-BB-B1-02-C1	At the bottom of Area B of EWL slab near eastern diaphragm wall	0-1	38.58	To be provided by MTRCL
EWL-E50-BB-B1-03-C1	At the bottom of Area B of EWL slab near eastern diaphragm wall	0-1	43.31	To be provided by MTRCL
EWL-W113-BB-B1-01-C1	At the bottom of Area C3 of EWL slab near western diaphragm wall	1-2	38.07	To be provided by MTRCL
EWL-W113-BB-B1-02-C1	At the bottom of Area C3 of EWL slab near western diaphragm wall	7-8	20.86	To be provided by MTRCL
EWL-W113-BB-B1-03-C1	At the bottom of Area C3 of EWL slab near western diaphragm wall	1-2	35.83	To be provided by MTRCL
EWL-W115-BB-B1-03-C1	At the bottom of Area C3 of EWL slab near western diaphragm wall	2-3	35.17	To be provided by MTRCL
NSL-E68-TT-T1-03-C1	At the top of Area C1 of NSL slab	0	43.11	To be provided by MTRCL

	near eastern diaphragm wall			
NSL-W30-TT-T1-01-C1	At the top of Area HKC of NSL slab near western diaphragm wall	1-2	43.60	To be provided by MTRCL
NSL-W30-TT-T1-02-C1	At the top of Area HKC of NSL slab near western diaphragm wall	1-2	40.92	To be provided by MTRCL
NSL-W30-TT-T1-03-C1	At the top of Area HKC of NSL slab near western diaphragm wall	1-2	38.15	To be provided by MTRCL
EWL-E32a(p2)-TT-T1-03-C1	At the top of Area HKC of EWL slab near eastern diaphragm wall	0	37.07	To be provided by MTRCL
EWL-E32a(p2)-TT-T1-04-C1	At the top of Area HKC of EWL slab near eastern diaphragm wall	0	44.07	To be provided by MTRCL
EWL-E97-BB-B1-01-C1	At the bottom of Area C3 of EWL slab near eastern diaphragm wall	0	39.03	To be provided by MTRCL
EWL-W48-BB-B1-01-C1	At the bottom of Area B of EWL slab near western diaphragm wall	0	39.18	To be provided by MTRCL
EWL-W48-BB-B1-02-C1	At the bottom of Area B of EWL slab near western diaphragm wall	1-2	34.96	To be provided by MTRCL
EWL-W129-BB-B1-03-C1	At the bottom of Area C3 of EWL slab near western diaphragm wall	1-2	39.62	To be provided by MTRCL
EWL-W133-BB-B1-03-C1	At the bottom of Area C3 of EWL slab near western diaphragm wall	1-2	35.63	To be provided by MTRCL

NSL-W52-TT-T1-01-C1	At the top of Area B of NSL slab near western diaphragm wall	0-1	39.59	To be provided by MTRCL
NSL-W52-TT-T1-02-C1	At the top of Area B of NSL slab near western diaphragm wall	1-2	29.75	To be provided by MTRCL
NSL-W36-TT-T1-01-C1	At the top of Area HKC of NSL slab near western diaphragm wall	1-2	34.19	To be provided by MTRCL
NSL-W25-TT-T1-03-C1	At the top of Area HKC of NSL slab near western diaphragm wall	0	39.59	To be provided by MTRCL
NSL-W33-TT-T1-02-C1	At the top of Area HKC of NSL slab near western diaphragm wall	0-1	39.07	To be provided by MTRCL
NSL-W33-TT-T1-03-C1	At the top of Area HKC of NSL slab near western diaphragm wall	1-2	36.84	To be provided by MTRCL
NSL-W127-TT-T1-02-C1	At the top of Area C3 of NSL slab near western diaphragm wall	0-1	36.28	To be provided by MTRCL
NSL-W127-TT-T1-03-C1	At the top of Area C3 of NSL slab near western diaphragm wall	1-2	19.28	To be provided by MTRCL

According to the holistic assessment strategy of the MTRCL, upon the completion of opening-up investigation under the second stage and in the third stage, the MTRCL will consolidate test results found in the first two stages, such as as-constructed details of the platforms and quality of works, and take into account the technical data provided by the coupler supplier, conduct a detailed structural analysis on the works for the Hung Hom Station Extension to ascertain if the overall structural integrity of the works is acceptable and determine if it is necessary to conduct strengthening works.

Remark 1: Preliminary results of the phased array ultrasonic test refer to the readings taken on site, subject to verification.

Remark 2: Allowable measurement tolerance of the phased array ultrasonic test is 3

millimetres.
Remark 3: Test results indicate that the steel bars may be Type B Reinforcement bars. Details are being investigated.
Remark 4: The test results are provided in accordance with the formal test report submitted by MTRCL on 7 January 2019

Other Findings:
In view of the increasing number of notes as the opening up work proceeds, we present them in tabular form for easy reference of the public. All the previous notes have been included in the table below.

Item	Date	Location	Within testing location?	Details and follow-up
1	20 December 2018	At the bottom of Area C1 of EWL slab near eastern diaphragm wall	No	One unconnected coupler was found exposed, details are being investigated.
2	22 December 2018	At the bottom of Area C1 of EWL slab near eastern diaphragm wall	No	One unconnected coupler was found exposed, details are being investigated.
3	24 December 2018	At the top of Area HKC of EWL slab near eastern diaphragm wall	No	One coupler was found not connecting to re-bar at one end, details are being investigated.
4	4 January 2019	At the bottom of Area C3 of EWL slab near western diaphragm wall	Yes	One re-bar and a coupler were found to be unconnected and cannot be tested. The findings have been confirmed. The number of threads on the re-bar was approximately 11-12.
5	7 January 2019	At the bottom of Area C3 of EWL slab near western diaphragm wall	Yes	One re-bar and a coupler were found to be unconnected and cannot be tested. There was a small gap between the re-bar and coupler. The number of threads on the re-bar was found to be approximately 2-3.
6	12 January 2019	At the bottom of Area C1 of EWL slab near eastern diaphragm wall	No	One unconnected coupler was found exposed, details are being investigated.
7			Yes	

	15 January 2019	At the bottom of Area C3 of EWL slab near eastern diaphragm wall		One re-bar and a coupler were found to be unconnected and cannot be tested, details are being investigated.
8	16 January 2019	At the top of Area HKC of EWL slab near eastern diaphragm wall	Yes	2 couplers were found not connecting to re-bar at one end, details are being investigated.
9	16 January 2019	At the bottom of Area C1 of EWL slab near western diaphragm wall	Yes	One re-bar and a coupler were found to be unconnected and cannot be tested. The number of threads on the re-bar was found to be approximately 3-4, details are being investigated.
10	17 January 2019	At the bottom of Area C3 of EWL slab near eastern diaphragm wall	No	A hydrophilic strip was found casted into the concrete.
11	19 January 2019	At the bottom of Area C2 of EWL slab near western diaphragm wall	No	A suspected hydrophilic strip was found casted into the concrete, details are being investigated.
12	20 January 2019	At the bottom of Area C3 of EWL slab near eastern diaphragm wall	No	A suspected hydrophilic strip was found casted into the concrete, details are being investigated.
13	20 January 2019	At the top of Area C3 of NSL slab near western diaphragm wall	No	A suspected hydrophilic strip was found casted into the concrete, details are being investigated.
14	24 January 2019	At the top of Area B of EWL slab near eastern diaphragm wall	Yes	One coupler was found not connecting to re-bar at one end, details are being investigated.
15	26 January 2019	At the top of Area C1 of NSL slab near western diaphragm wall	No	A suspected hydrophilic strip was found casted into the concrete, details are being investigated.

Ends

 Last review date: 28 Jan 2019

Annex 6

Shatin to Central Link (SCL)
Contract No.1112 - Hung Hom Station and Stabling Sidings

(Translation)

Purpose

This paper updates the latest development of the Contract No. 1112 – Hung Hom Station and Stabling Sidings under the Shatin to Central Link (SCL).

Background

2. The scope of works under the Contract No.1112 mainly includes the Hung Hom Station (HUH) Extension, the Hung Hom Station North Approach Tunnel (NAT), the Hung Hom Stabling Sidings (HHS) and the Hung Hom Station South Approach Tunnel (SAT). The Contractor is Leighton Constructors (Asia) Limited. The works commenced in March 2013 and the original anticipated completion date is April 2018. Due to a series of incidents at HUH Extension and the related investigations, the completion date has to be reviewed.

Hung Hom Station North Approach Tunnel

3. The NAT is located at the north of HUH. Its upper and lower decks are about 125 metres long, linking Hung Hom Station to the direction towards Ho Man Tin Station. The entire approach tunnel is a reinforced concrete structure constructed by the cut and cover method.

Hung Hom Stabling Sidings

4. Located at the east of the platform of HUH, the HHS is about 500 metres long and around 280 metres wide. There will be 11

tracks for parking trains, 1 track for heavy cleaning and 1 track for train inspection. The entire stabling sidings is a reinforced concrete structure constructed by the cut and cover method.

Hung Hom Station South Approach Tunnel

5. The SAT is located at the south of the HUH. Its upper deck is about 127 metres long, connecting to the East West Corridor; lower deck is about 40 metres long, connecting to the North South Corridor. The entire approach tunnel is a reinforced concrete structure constructed by the cut and cover method.

Current situation

6. In April 2018, as there were insufficient "Request for Inspection and Survey Checks Forms" (RISC Form) before the pouring of concrete for the NAT and the SAT, MTRCL issued non-conformance reports to the Contractor and reported the incident to the Highways Department (HyD) in June and July 2018. HyD had been following up with the case and requested MTRCL to provide details.

7. On 20 December 2018, MTRCL wrote to HyD informing that, in addition to the RISC forms, the missing construction records for NAT included the specific information about a change of design of some connections during construction from lapping of re-bars to coupler connections; extent of the change; and materials testing records. MTRCL advised that they were collecting and comprehensively reviewing the relevant information and would make a proposal to verify the as-built conditions. At that time, MTRCL expected that there were similar issues at the SAT. Subsequently, at a meeting between the Government and MTRCL held on 23 January 2019, as MTRCL was still unable to explain why they had not submitted to the Buildings Department (BD) the as-built information of NAT, HHS and SAT, MTRCL advised that given the insufficient construction records in the above three items of works, they need more time to get the comprehensive construction information.

8. At a meeting between the Government and MTRCL held on 24 January 2019, MTRCL further advised that only about 60% of RISC forms for NAT were available. MTRCL has not yet reported to the Government the status of SAT and HHS.

9. MTRCL is still collecting and reviewing the as-constructed details (including the site photos during construction) and as-built information. HyD received MTRCL's reply on 28 January 2019 that for NAT, MTRCL would consolidate the Contractor's design amendment drawings and appoint engineering consultants to check the as-constructed records and design amendment drawings. MTRCL would also carry out similar steps for SAT and HHS.

Implications on the partial commissioning of Tuen Ma Line under the SCL

10. On 24 January 2019, MTRCL advised the Transport and Housing Bureau and its Expert Adviser Team for SCL, and HyD that the feasibility of partial commissioning options mainly hinged on whether the timely approval of the relevant departments including BD and Fire Services Department (FSD) could be obtained for the NAT and the Tuen Ma Line signaling control rooms situated within HHS. Since any scale of partial commissioning requires the normal operation of the aforementioned signaling control rooms, whether, in respect of the relevant rooms, approval of the relevant departments including BD and FSD could be obtained would have a direct bearing on the feasibility of partial commissioning. However, even if the signaling control rooms are approved, MTRCL still has to overcome other technical difficulties, including the laying of additional signaling and communication cables for relevant systems for the avoidance of encroaching upon other works areas in HUH for which approval had not yet been granted.

11. MTRCL also has indicated that the system that controls Ho Man Tin Station is situated in the HUH Extension. As such, partial commissioning up to Ho Man Tin Station would depend on the overall

situation of the HUH Extension. Besides, without the HUH platform coming into service, trains from Tai Wai Station to Ho Man Tin Station would have to enter HHS via the NAT for turning back. In this connection, options of partial commissioning covering Ho Man Tin Station would also depend on whether the approval of relevant departments including BD and FSD could be obtained for NAT and HHS.

Next step

12. In view of the above problems, the Government has sternly requested MTRCL to provide a detailed account of the case; review whether there are similar problems in other parts of the relevant contract; submit a holistic study to ascertain the as-built conditions; and assess the programme implications on the full or partial commissioning of Tuen Ma Line.

Transport and Housing Bureau
Highways Department
January 2019