

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

**Progress Update of the Construction of the Shatin to Central Link
(As at 30 September 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 30 September 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 latest cost estimate of the main works of the SCL project from the MTRCL on 5 December 2017. MTRCL indicated a need of adjusting upward the entrustment cost of the main works of the SCL

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.

project, 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 last year 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 the 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 latest 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 30 September 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 and diversion works for the underground utilities at Che Kung Miu Road were substantially completed. The road reinstatement works at Che Kung Miu Road was scheduled for commencement in December 2018. 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 substantially completed. The relevant system testing and statutory inspections were in progress. 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. Construction of at-grade footpath outside the station was substantially completed. Installation of the lighting system was in progress.

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. 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-June 2018, the structural works of the station was completed. The fitting out works, building services works and E&M works inside the station are in progress. 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. 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. The fitting out works, building services works and E&M works inside the station are in progress. Construction works of the station entrances, ventilation building and the drainage pipe laying works at Ma Tau Wai Road is on-going and the progress is generally on schedule. It is expected that Ma Tau Wai Road will be resumed in three-lane and two-way mode in the first half 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)). The 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 the 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.

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. The 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. The 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 most 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. According to MTRCL’s monitoring data, the settlement has become steady. The MTRCL would continue to monitor these monitoring points. To continue monitoring the effect to the surrounding buildings and facilities due to the remaining works, including the shallow excavation involved in the reinstatement of the section of Ma Tau Wai Road near the station, MTRCL has assessed the pre-set trigger levels for the temporary suspension of the works in respect of the existing monitoring points around To Kwa Wan Station, and proposed to update the trigger levels of some of the monitoring points. HyD agreed with the update after scrutinizing the proposal. The updated pre-set trigger levels are listed in MTRCL’s progress report. (Appendix 3 of **Annex 2**)

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 adjuster 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 is drawing up a scheme on a without prejudice basis for the provision of financial assistance to the affected residents of building units in vicinity of To Kwa Wan Station for maintaining walls in their units. MTRCL would simplify the procedures in the hope of implementation at the soonest.

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 also plans to 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 were substantially completed. E&M installation works adjacent to the railway track was in progress. 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. Regarding the incident of cut-short of reinforcement at the platform of the Hung Hom Station Extension under the SCL project, we reported in detail at the special meeting of the Panel on Transport held on 31 August 2018 and submitted to the Sub-committee on Matters Relating to Railways the quarterly updated information paper on 15 October 2018. Please refer to the paper submitted by

the Government to the Sub-committee (LC Papers No. CB(4)1514/17-18(01) and CB(4)44/18-19(01)).

23. The Government attaches great importance of the incident as it is related to public safety. The Chief Executive and the Executive Council appointed on 10 July a Commission of Inquiry (“Commission”) which is chaired by Justice Michael Hartmann under the Commissions of Inquiry Ordinance (Chapter 86) to carry out investigations on the facts and circumstances surrounding the steel reinforcement fixing works at 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.

24. In the SCL Project Supervision Committee meeting held on 28 August this year, MTRCL mentioned that there were quality problems of concrete at part of the East West Line (“EWL”) platform slab soffit at Hung Hom Station Extension. HyD and BD were very concerned about the incident and visited the site for detailed understanding. BD carried out on-site inspection in the morning of 29 August and requested MTRCL to submit an investigation report. In the afternoon of the same day, MTRCL provided HyD with three Non-conformance Reports issued to the Contractor between 17 and 22 August regarding concreting works of the platform slab and requested the Contractor to remove the substandard concrete.

25. HyD asked MTRCL on 29 August to clarify whether there was safety issue about the EWL platform slab. HyD and its M&V consultant also inspected the site on 30 August. It was found at zones B, C1 and C2 of the EWL platform slab soffit at Hung Hom Station Extension that at many locations after the removal of the concrete surface, there were obvious quality problem inside the concrete. As the quality problem occurred inside the concrete and there was no obvious signs on concrete surface, the HyD and the M&V consultant were unable to discover this quality problem in past inspections. On the same day, the HyD immediately issued a letter requesting MTRCL: (i) to check whether there is any safety issue about the platform slab, and whether construction workers can continue working on or under it; (ii) to take immediate actions that eliminate potential safety hazards; (iii) to review the quality of concrete of the platform slab comprehensively; (iv) to

provide an investigation report; and (v) to make a proposal on remedial works as soon as possible for the BD's consideration. MTRCL wrote to HyD on 31 October confirming that there was no imminent danger at the platform slab and also reporting the progress of investigation.

26. As the Government cannot grasp the as-constructed details of the Hung Hom Station Extension at this stage, THB, EAT, relevant government departments and MTRCL have held several meetings to discuss the solutions. The Government requested MTRCL to formulate a comprehensive strategy to verify the condition of the platform slab structure of the Hung Hom Station Extension. The comprehensive 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, MTRCL submitted the first stage report 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, 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.

27. On 23 November, MTRCL submitted a proposal on comprehensive strategy to the Government. THB and relevant government departments are reviewing MTRCL's strategic proposal in detail, and are asking MTRCL to clarify and make necessary amendments. The review would be completed shortly. The proposal would be disclosed upon acceptance by the Government.

Hung Hom to Admiralty Section

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

28. The main works of the Cross Harbour Section continue. The construction of the ventilation building near the shore at Hung Hom was in progress. Installation of immersed tube tunnel units was completed. The backfilling works at the seabed trench of Victoria Harbour is in progress. Connection works of the tunnel units at Causeway Bay Typhoon Shelter 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)

29. 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 on-going. For the cut and cover Western Approach Tunnels from the west of Exhibition Centre Station to Fenwick Pier Street, the tunnel construction works was on-going.

30. 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 subsequently 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.

31. 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, and more rock excavation was needed. MTRCL considered to change the rock excavation method to blasting in order to maintain the progress of the works at Exhibition Centre Station. However, MTRCL has to conduct the risk assessment for the blasting works in order to ensure that the blasting works will not pose any risk to the neighbourhood due to any potential presence of wartime bomb in the vicinity. Eventually, if it is impossible to excavate by blasting, there will be a need to excavate rock by mechanical breaking. With a longer construction period, there will be a higher risk of impact on the progress of works.

32. 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, 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 Drive East, etc. to facilitate the construction of the remaining stages of Exhibition Centre Station.

33. 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.

34. 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. On the other hand, the MTRCL's excavation works at the location concerned were completed. 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.

35 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 this year. 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. HyD together with the M&V consultant carried out site inspection on the following day, covering the buildings and structures near monitoring points under its purview and with readings exceeding the highest trigger level, and neither discovered any obvious structural safety problem on the buildings and structures nor abnormal condition on the nearby areas of those underground utilities. BD also inspected relevant buildings nearby and did not find any obvious structural problem on that day. BD also continued to monitor the structural conditions of relevant buildings to ensure their structural safety. HyD requested MTRCL to conduct a detailed analysis of the settlement arising from the works nearby and, for necessary revision to each of the trigger levels under the three-tier activation mechanism, to provide concrete justifications and consult stakeholders such as HyD, relevant departments and utility undertakers on their proposed revision.

36. The Government announced on 28 September the monitoring and reporting mechanism for the impact of the SCL railway project on nearby structures and public facilities, as well as the updated data on the settlement of the Exhibition Centre Station. Under the monitoring and reporting mechanism, the MTRCL confirmed the safety of buildings, structures and public facilities near the

site of the Exhibition Centre Station. After the relevant departments accepted the revised levels submitted by MTRCL, the excavation works on the site were resumed on 29 September. MTRCL continues to closely monitor the conditions of nearby buildings, structures and public facilities as well as their corresponding settlement records. As the relevant excavation is one of the major construction activities at Exhibition Centre Station, the works progress and the cost have thus been affected as a result of the works suspension during the period from 10 August to 28 September.

Conclusion

37. In view of the above assessments as mentioned in paragraphs 9 to 36 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 earlier on, 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 so that MTRCL could try its best to recover some of the delay to the “Tai Wai to Hung Hom Section”. 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, the target commissioning date will need to be further reviewed.

38. The Government has suggested MTRCL to study the feasibility on the partial opening of some stations and sections of the Tai Wai to Hung Hom Section. Since the suggestion involves complicated technicalities and railway operation issues, it will take time for MTRCL to conduct detailed assessment. The Government and the MTRCL will continue with the study; there is no decision made at this stage.

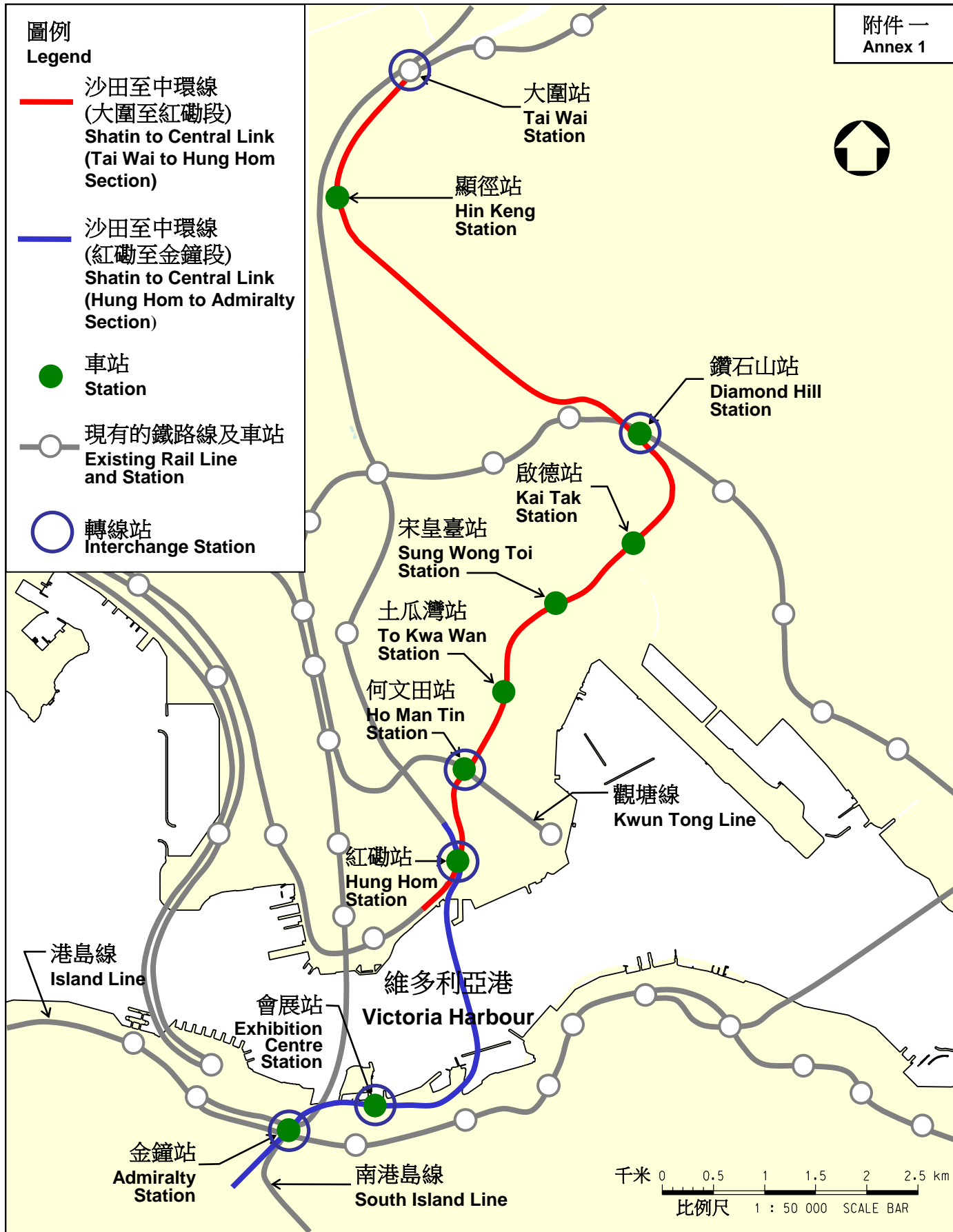
39. Given the impact of site handover arrangement under the WDII project, the complicated ground conditions below Exhibition Centre Station, the settlement issue leading to a suspension of the excavation works at the Exhibition Centre Station, as well as the allowance of flexibility for the construction 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
December 2018**

圖例
Legend

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



圖則名稱 drawing title

沙田至中環線的走線

Alignment of the Shatin to Central Link

圖號 drawing no.

HRWSCLO03-SK0465

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鐵路拓展處 RAILWAY DEVELOPMENT OFFICE



路政署
HIGHWAYS DEPARTMENT

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

**Progress Update of the Shatin to Central Link
(As at 30 September 2018)**

INTRODUCTION

This report updates Subcommittee members on the progress of Shatin to Central Link (“SCL”) as at 30 September 2018.

OVERVIEW OF THE SCL PROJECT

Works progress

Overall progress

2. As at 30 September 2018, the overall works for SCL were 87% complete compared to the planned completion rate of 92% 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 58 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 in phases. The study will have to take into account modifications to the signalling system, track design to accommodate train operation for partial opening as well as the consequential impacts to full line opening. As for the Hung Hom to Admiralty Section, we will endeavour to keep to target completion in 2021 as much as possible while ensuring safety at all times.

4. Around 99% of the works of the Tai Wai to Hung Hom Section have been completed as at 30 September 2018, compared to the originally planned completion rate of 100%. As at 30 September 2018, key progress include:

a. Conversion process from 7-car trains to 8-car trains on the West Rail Line (“WRL”) has been completed in May; and

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

5. Hung Hom to Admiralty Section was 73% complete in overall terms as at 30 September 2018, compared to the originally planned completion rate of 83%. 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 and connection works are underway; 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

6. 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)

7. Fitting out works, building services, electrical and mechanical (“E&M”) equipment installation have been 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. Meanwhile, the re-provisioning works for Hin Tin Playground have been completed. The Playground was handed over to Leisure and Cultural Services Department and was opened for public use in July 2018.

8. The viaduct and at-grade tunnel box connecting Hin Keng Station, drainage works and street lighting installation near the viaduct, as well as the related greening works have been completed. The construction of cycling tracks, bicycle parking spaces and new lay-bys were completed, and opened for public use in July 2018. The works for widening the pedestrian crossing outside Hin Keng Station are in progress, whereas the remaining road resurfacing works on Che Kung Miu Road are targeted to be completed in the fourth quarter of 2018.

9. For the tunnel section inside Lion Rock, overhead line fixing and E&M installation works have been completed. Statutory inspections for tunnel E&M systems have commenced. 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 have also been completed in these tunnels.

11. At Ma Chai Hang, the structural works and architectural builder’s

works and finishes (“ABWF”) for the ventilation building have been substantially completed. The green roof for the ventilation building and landscaping works at the adjacent areas have also been substantially completed in the third quarter of 2018. Inspection of the ventilation building on fire services and building services installation were completed. Other remaining system tests and statutory inspections are scheduled in the fourth quarter of 2018.

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 substantially completed. The fire services and building services inspections have been completed. The remaining system tests and statutory inspections are scheduled in the fourth quarter of 2018.

13. The majority of the structural works for the adjacent Wong Tai Sin Public Transport Terminus (“PTT”) were substantially completed. Construction of the road section which connects Shatin Pass Road and the PTT and installation of noise barriers and street furniture including directional signage are in progress. The design of the entrance/ exit of lower deck of PTT connected with Shatin Pass Road was revised as requested by relevant government departments, and the preparation of corresponding temporary traffic management schemes are in progress.

14. At Diamond Hill Station Extension, E&M and building services works and the construction of Emergency Vehicular Access have been substantially completed. Site formation for landscaping is in progress. Inspections on fire service installation were completed in September 2018 while other statutory inspections are targeted to commence before the end 2018.

15. The pedestrian subways connecting the existing Diamond Hill Station and its extension underneath Lung Cheung Road were substantially completed. Road drainage, kerb and street furniture installation works are in progress. Reinstatement works on Lung Cheung Road have been substantially completed in September 2018.

16. Modification works continue at the existing Diamond Hill Station in its transformation into an interchange station for the existing Kwun Tong Line and the SCL. With the last additional escalators opened for use in June 2018, all the two lifts and four escalators in the existing Diamond Hill Station have been installed. 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 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 have been relocated to the future Water Feature Park of the Diamond Hill Comprehensive Development Area Site in August and September 2018 respectively.

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 have been completed and statutory inspections have commenced.

(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 have been substantially completed. Following the completion of fire services and building services inspections, the remaining statutory inspections will continue in the fourth quarter of 2018. The temporary footpaths connecting Kai Tak Station and the public roads in the vicinity have been substantially completed, and the road lighting installation works are in progress. The remaining sections of public roads to be constructed by relevant government departments and organisations are targeted for completion before the commissioning of the Tai Wai to Hung Hom Section.

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 and is expected to commence in early 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 has been carried out.

24. Fitting out and E&M works at Sung Wong Toi Station and the associated entrance towards Nam Kok Road are in full swing. Reinstatement of Nam Kok Road carriageway will be completed and opened for public use in October 2018, whereas reinstatement of Nam Kok Road footpath, which is on-going, 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.

25. Internal structural works at the emergency access shafts on Tam Kung Road and Chi Kiang Street have been substantially completed, fitting out and E&M works are underway.

26. E&M, fitting out and building services works at all levels inside To Kwa Wan Station have been substantially completed. Fire services inspection has commenced in November 2018, followed by other statutory inspections. External finishing for the four station entrances at To Kwa Wan Market, Lok Shan Road, Kiang Su Street and Chi Kiang Street are on-going. Permanent reinstatement of water mains, drainage and roads are being carried out on Ma Tau Wai Road in phases and is expected to be completed in late 2019.

27. With regard to the non-compliance concerning three locations at an internal wall adjacent to two staircases near the upper platform level in To Kwa Wan Station, mosaic tiles and plastering of the internal wall have been removed for rectification works. With the approval from the

relevant government departments on the remedial proposal, the remedial works are expected to commence after the fire services inspections within the station.

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

28. 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 have been completed. For the tunnel connecting the existing EAL to the extension of Hung Hom Station to form the cross-harbour EAL, structural works and track works were substantially completed. E&M installation works have commenced in August 2018.

29. With the completion of all tunnel structures, all temporary traffic management schemes along Chatham Road North, Winslow Street underpass slip road, and 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.

30. E&M works, building services and fitting out works for the two levels of new platforms built under the existing Hung Hom station podium are substantially completed for testing and commissioning works. To prepare for the future station re-arrangements, modification works are now being carried out in stages. Stage three modification works including ABWF works, building services provisions, as well as new escalators and lifts installations are substantially complete.

31. 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 have been substantially completed and inspection on fire services installation was also completed in mid-May 2018.

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

32. 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 are expected to be completed in early 2019.

33. With the anticipated completion of marine works in CBTS by end 2018, moorings in CBTS will be reinstated in phases progressively. The Corporation will continue to liaise with the Marine Department and relevant stakeholders to ensure that the mooring arrangement is well coordinated.

34. To facilitate the seabed restoration works after the completion of IMT immersion and installation works, the existing fairway diversion within the Victoria Harbour, which has been implemented from November 2017, will continue until late 2018.

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

35. 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. Structural construction of a sump pit in the up-track tunnel was completed in September 2018.

36. The temporary reclaimed land at the western side of CBTS, which was the supporting works site for the tunnelling works, was released in February 2018. The footpath along the waterfront adjacent to the former Police Officers' Club ("POC") was reopened.

37. At the works site of the former 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 were completed and the associated basement construction works have commenced since the end of June 2018.

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 has been completed. Reinstatement of the rest area and recreational facilities is targeted to commence 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. The breakthrough works between the TBM tunnels and the SCL platforms at Admiralty Station were completed and subsequent structural construction works are targeted to be completed in late 2018.

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 which might prolong the excavation programme with a risk of programme delay. The project team will further review the situation and formulate appropriate measures to minimise the risk of prolonged excavation.

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. A 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 extending from Hong Kong Park and tunnel lining works for the overrun tunnel 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. While excavation works at To Kwa Wan Station have been completed, in order to allay public concerns on the possible impacts on the nearby structures and facilities, the relevant excavation works for Exhibition Centre Station has been temporarily suspended since 10 August.

52. The Government has announced on 28 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.

53. 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.

54. The project team of the Corporation has reaffirmed the continuous safety and integrity of the buildings, structures and utilities near the Exhibition Centre Station works sites. With a set of revised trigger values agreed with relevant government departments, the excavation works for Exhibition Centre Station has been resumed on 29 September. Going forward, the Corporation will continue to proceed with the excavation works in a prudent manner and exercise 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.

55. 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.

56. 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, the Corporation is putting together a community care programme to provide financial support to them in carrying out the repair works. Details of the programme are being worked out and will be announced shortly.

Platform slab of Hung Hom Station extension

57. As previously reported, inaccuracies are 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.

58. 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. Taking into account comments from relevant government departments and their experts, the Corporation has further revised the initial proposal and submitted a holistic strategy proposal on 23 November, outlining a staged approach to verify if the as-constructed condition of the platform slabs is consistent with the latest design drawings received as well as the workmanship quality of the coupler connections. The verification test would include opening up a number of locations at the platform slabs to check the steel bar/ coupler connection to give assurance to the quality of the works. The verification and testing will commence as soon as possible upon agreement on the methodology.

59. As regards the honeycombed concrete observed on the underside of the East West Corridor platform slab which we reported to the Panel on Transport on 31 August 2018, a comprehensive inspection has commenced in mid-September 2018. Upon completion of the inspection, rectification measures will be formulated and carried out to ensure the works comply with the required standard.

60. The Corporation will also co-operate 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.

61. 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 future projects. The external consultant appointed by the CWC to undertake the review has submitted an interim report with a number of recommendations. The CWC is now studying the recommendations in the interim report.

NEW TRAINS AND TRAIN CONVERSION

62. 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.

63. On the other hand, 17 sets of new trains for TML are being delivered to Hong Kong in batches. The delivery is expected to be completed in the fourth quarter of 2018. Stringent testing and commissioning for the delivered new trains are underway at Pat Heung Depot and Tai Wai Depot.

64. 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.

65. Following the overhead line energisation at the track sections between Hin Keng and Kai Tak stations since mid-October 2017, dynamic test of the trains is being carried out on the section, as well as the existing WRL and MOL to facilitate the future operation of TML. Integrated tests of other railway systems including signalling and passenger information systems have also commenced along the TML.

IMPROVEMENT WORKS FOR THE OPERATING RAILWAY FACILITIES

66. On 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.

67. 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.

68. 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.

69. 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.

70. 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 also be in place 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

71. Since mid-2012, 28 major civil and 30 major electrical & mechanical (“E&M”) contracts¹, together with other minor contracts, have been awarded with a total sum of \$57.722 billion. The contract sums for civil works and E&M works are about \$43.820 billion and \$13.902 billion respectively (Please refer to Enclosure I)

72. 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

73. 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.

74. 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.

75. 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.

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.

76. 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”)

77. On 5 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

78. 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, and dedicated MTR and Contractors’ Hotlines are available for handling enquiries and complaints in relating to the project. The SCL Information Centre in To Kwa Wan has also handled over 1,300 enquiries since October 2012.

EMPLOYMENT OPPORTUNITIES

79. As at 30 September 2018, about 3,715 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 763 trainees with 519 having completed the trade test and continuing their careers in the field.

CONCLUSION

80. Members are invited to note the above information.

MTR Corporation Limited
December 2018

Expenditure report as at 30 September 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 | 43,819.7 | 42,502.9 | 1,968.7 |
| E&M works | 13,901.8 | 5,859.7 | 1,208 |
| Total | 57,721.5 | 48,362.6 | 3,176.7 |

* The estimated amount of unresolved claim: Amount claimed (\$4,267.5 million) – Interim award (\$1,090.8 million) = \$3,176.7 million (See Table 2)

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 | 447 | 2,742.5 | 773.8 |
| E&M works | 9* | 0 | 0 | 138 | 1,525 | 317 |
| Total | 310 | 3,039.2 | 1,780.8 | 585 | 4,267.5 | 1,090.8 |

* 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 30 September 2018, the Corporation received 895 substantiated claims and the amount claimed in total was about \$7,306.7 million, representing 12.7% 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 30 September 2018, 310 cases were resolved and about \$1,780.8

million was awarded, representing about 3.09% 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 \$1,090.8 million was made for some cases.

Overall works progress of the SCL as at 30 September 2018

Overall works completed : 87%

Percentage completed as originally planned ⁽¹⁾: 92%(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 | 34% |
| 1121 | EAL Cross Harbour Tunnels | 95% |
| 1122 | Admiralty South Overrun Tunnel | 90% |
| 1123 | Exhibition Centre Station and Western Approach Tunnel | 66% |

| | | |
|-------|-------------------------------------------------------------------------|------|
| 1124 | Admiralty SCL Related Works | 43% |
| 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 | 79% |
| 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 71 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 | 63% |
| 1151 | Rolling Stock Modification and New Train Cars for SCL Phase 1 | 98% |
| 1152 | Signalling System for SCL Phase 1 & Signalling System Modification for MOL and WRL | 98% |
| 1152B | Signalling System for SCL Phase 2 | 77% |
| 1153 | Tunnel ECS for SCL Phase 1 | 100% |
| 1153B | Tunnel ECS for SCL Phase 2 | 45% |
| 1154 | Platform Screen Doors for SCL Phase 1 & APG Retrofit for MOL | 99% |
| 1154B | Platform Screen Doors for SCL Phase 2 & APG Retrofit for EAL | 39% |
| 1155 | Power Supply System and Trackside Auxiliaries for SCL Phase 1 | 98% |
| 1155B | Power Supply System and Trackside Auxiliaries for SCL Phase 2 | 47% |
| 1159 | Lifts for SCL Phase 1 | 97% |
| 1162 | TETRA System for SCL Phases 1 & 2 | 98% |
| 1162B | Radio Distribution Network System for SCL Phases 1 & 2 | 71% |
| 1163 | AFC System and SAM System for SCL Phases 1 & 2 | 72% |
| 1164 | Building Services for Diamond Hill Station | 99% |
| 1164B | Building Services for SCL Hong Kong Island Section | 19% ⁽³⁾ |
| 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 | 65% |
| 1169 | Communications System for SCL Phase 1 | 97% |
| 1169B | Communications System for SCL Phase 2 | 25% |

| | | |
|-------|----------------------------------------------------------------------|------|
| 1172 | Escalators for SCL Phase 1 | 99% |
| 1172B | Lift and Escalators for SCL Phase 2 | 22% |
| 1173 | Building Services for Hung Hom Station and Hung Hom Stabling Sidings | 93% |
| 1175 | Building Services for Kai Tak Station | 100% |
| 1176 | Building Services for Sung Wong Toi Station and Ancillary Building | 97% |
| 1177 | Building Services for To Kwa Wan Station and Ancillary Building | 98% |
| 1183 | EAL Signalling System Modification | 100% |
| 1191 | Floodgate System for SCL Phase 2 | 36% |

Note:

(3) E&M Contract 1164B was awarded on 14 March 2017.

Enclosure III

| | Monitoring Point | Type | Settlement Readings (mm) | Latest pre-set trigger levels (mm) |
|--------------------------------------------------------------|-------------------------|------------------|---------------------------------|-------------------------------------------|
| 1. To Kwa Wan Section (Readings as at September 2018) | | | | |
| 1 | U104 | Gas Pipe | -29.6 | - 34.9 |
| 2 | U118 | Gas Pipe | -20.4 | -26.9 |
| 3 | U119 | Gas Pipe | -21.8 | -30.8 |
| 4 | U120 | Gas Pipe | -33.7 | -39.0 |
| 5 | U125 | Gas Pipe | -45.4 | -54.2 |
| 6 | U127A | Gas Pipe | -21.1 | -26.1 |
| 7 | U202 | Gas Pipe | -33.9 | -38.5 |
| 8 | U112 | Electrical Cable | -26.9 | -37.0 |
| 9 | U128 | | -24.2 | -36.0 |
| 10 | U98 | Water Main | -18.9 | -31.0 |
| 11 | U101 | Water Main | -28.7 | -35.0 |
| 12 | U106A | Water Main | -32.7 | -37.0 |
| 13 | G142 | Ground | -16.3 | -40.0* |
| 14 | G143 | Ground | -11.1 | -25.0 |
| 15 | G160B | Ground | -50.1 | -62.0 |
| 16 | G369A | Ground | -27.6 | -40.0* |
| 17 | G501 | Ground | -28.9 | -40.0 |
| 18 | G522A | Ground | -20.4 | -40.0* |
| 19 | G818A | Ground | -38.8 | -52.0 |
| 20 | G128 | Ground | -33.4 | -43.4* |
| 21 | G83A | Ground | -30.8 | -40.8* |
| 22 | G85 | Ground | -32.8 | -42.8* |
| 23 | G505 | Ground | -30.5 | -40.5* |
| 24 | G506 | Ground | -39.0 | -49.0* |
| 25 | G509A | Ground | -31.4 | -41.4* |
| 26 | G515A | Ground | -30.7 | -40.7* |
| 27 | G164 | Ground | -37.3 | -47.3* |
| 28 | G167 | Ground | -33.6 | -43.6* |
| 29 | G171A | Ground | -35.1 | -45.1* |
| 30 | G983 | Ground | -33.3 | -43.3* |
| 31 | B87A | Building | -28.6 | -36.6* |
| 32 | B88A | | -31.8 | -39.8* |
| 33 | B93 | | -16.3 | |

| | Monitoring Point | Type | Settlement Readings (mm) | Latest pre-set trigger levels (mm) |
|----|-------------------------|-------------|---------------------------------|-------------------------------------------|
| 34 | B98 | Building | -27.6 | -57.2* |
| 35 | B171A | | -49.2 | |
| 36 | B750 | | -38.0 | |
| 37 | B117 | Building | -21.1 | -45.2* |
| 38 | B172 | | -37.2 | |
| 39 | B173 | | -37.1 | |
| 40 | B118 | Building | -24.1 | -42.3* |
| 41 | B175 | | -34.3 | |
| 42 | B119A | Building | -24.2 | -40.7* |
| 43 | B178 | | -32.7 | |
| 44 | B120A | Building | -29.0 | -38.0* |
| 45 | B179A | | -30.0 | |
| 46 | B747 | | -23.1 | |
| 47 | B121 | Building | -25.3 | -40.1* |
| 48 | B182A | | -32.1 | |
| 49 | B122 | Building | -24.9 | -42.2* |
| 50 | B184A | | -34.3 | |
| 51 | B185 | Building | -33.1 | -41.1* |
| 52 | B186 | | -32.4 | |
| 53 | B124 | Building | -21.6 | -40.9* |
| 54 | B128 | | -25.6 | |
| 55 | B187 | | -32.9 | |
| 56 | B125 | Building | -26.5 | -44.0 |
| 57 | B608 | Building | -34.2 | -42.2* |
| 58 | B609 | | -32.8 | |
| 59 | B127 | Building | -21.9 | -41.9* |
| 60 | B191 | | -32.2 | |
| 61 | B192 | | -33.9 | |
| 62 | B129A | Building | -18.7 | -26.7* |
| 63 | B131A | | -10.8 | |
| 64 | B135 | Building | -10.3 | -29.7* |
| 65 | B156A | | -21.7 | |
| 66 | B155A | Building | -15.3 | -23.3* |
| 67 | B133 | Building | -15.9 | -23.9* |
| 68 | B136A | | -14.3 | |
| 69 | B600 | | -12.6 | |

| | Monitoring Point | Type | Settlement Readings (mm) | Latest pre-set trigger levels (mm) |
|----|-------------------------|-------------|---------------------------------|-------------------------------------------|
| 70 | B110 | Building | -24.7 | -28.8 |
| 71 | B111 | Building | -25.5 | -28.9 |
| 72 | B112 | | -23.3 | |
| 73 | B167A | Building | -36.9 | -44.9* |
| 74 | B166A | Building | -58.8 | -66.8* |
| 75 | B160 | Building | -35.1 | -51.0 |
| 76 | B163 | | -26.1 | |
| 77 | B164 | | -32.0 | |
| 78 | B165A | | -43.1 | |
| 79 | B190 | Building | -30.2 | -40.0 |
| 80 | B200A | Building | -11.8 | -24.1 |
| 81 | B201A | | -18.1 | |
| 82 | B206A | | -3.3 | |
| 83 | B803 | | -17.8 | |
| 84 | B202A | Building | -18.5 | -26.5* |
| 85 | B207A | | -8.6 | |
| 86 | B326A | | 0.5 | |

* Updated as at Nov 2018

2. Exhibition Centre Station and Western Approach Tunnel

(Readings as at September 2018)

| | | | | |
|----|------------------|----------|-------|-----|
| 1 | 1123-AA-GSM-15-B | Pavement | -27.2 | -50 |
| 2 | 1123-AB-GSM-01 | Pavement | -69.4 | -85 |
| 3 | 1123-AB-GSM-05 | Pavement | -34 | -50 |
| 4 | 1123-AB-GSM-07 | Pavement | -39.4 | -50 |
| 5 | 1123-AB-GSM-11 | Pavement | -23.6 | -45 |
| 6 | 1123-AC-GSM-03 | Pavement | -31.1 | -45 |
| 7 | 1123-AC-GSM-08 | Pavement | -32.5 | -45 |
| 8 | 1123-AC-GSM-11 | Pavement | -62.9 | -80 |
| 9 | 1123-AE-GSM-02-B | Pavement | -49.8 | -75 |
| 10 | 1123-Z1-GSM-09-A | Pavement | -26.7 | -40 |
| 11 | 1123-Z1-GSM-31-C | Pavement | -63 | -75 |
| 12 | 1123-Z1-GSM-61 | Pavement | -33.8 | -45 |
| 13 | 1123-Z1-GSM-62 | Pavement | -33.7 | -40 |
| 14 | 1123-Z1-GSM-66-B | Pavement | -54.6 | -80 |

| | Monitoring Point | Type | Settlement Readings (mm) | Latest pre-set trigger levels (mm) |
|----|-------------------------|--------------|---------------------------------|-------------------------------------------|
| 15 | 1123-Z2-GSM-04-B | Pavement | -47.9 | -65 |
| 16 | 1123-Z2-GSM-07 | Pavement | -58.9 | -75 |
| 17 | 1123-Z2-GSM-08 | Pavement | -61.7 | -80 |
| 18 | 1123-Z2-GSM-11-A | Pavement | -54.7 | -75 |
| 19 | 1123-Z2-GSM-14 | Pavement | -29.3 | -50 |
| 20 | 1123-Z2-GSM-15 | Pavement | -35.4 | -50 |
| 21 | 1123-Z2-GSM-16 | Pavement | -32.7 | -45 |
| 22 | 1123-Z3-GSM-02 | Pavement | -64.8 | -80 |
| 23 | 1123-Z3-GSM-03-A | Pavement | -51.2 | -70 |
| 24 | 1123-AB-GSM(USM)-40 | Pavement | -35.5 | -50 |
| 25 | 1123-AB-GSM(USM)-43 | Pavement | -43.6 | -60 |
| 26 | 1123-AC-GSM(USM)-02 | Pavement | -27.7 | -40 |
| 27 | 1123-AC-GSM(USM)-03 | Pavement | -31.9 | -45 |
| 28 | 1123-AC-GSM(USM)-04 | Pavement | -75.4 | -90 |
| 29 | 1123-AC-GSM(USM)-18-A | Pavement | -41.5 | -55 |
| 30 | 1123-AE-GSM(FW)-34-C | Pavement | -42.4 | -65 |
| 31 | 1123-Z3-GSM(FW)-02 | Pavement | -76.9 | -95 |
| 32 | 1123-AB-USM(FW)-03 | Water Main | -58.5 | -90 |
| 33 | 1123-AB-USM(FW)-04 | Water Main | -35.3 | -90 |
| 34 | 1123-AB-USM(FW)-08-A | Water Main | -45.3 | -90 |
| 35 | 1123-AB-USM(FW)-09 | Water Main | -36.5 | -90 |
| 36 | 1123-AB-USM(FW)-40 | Water Main | -32.8 | -90 |
| 37 | 1123-AE-USM(FW)-02-A | Water Main | -71.2 | -90 |
| 38 | 1123-Z1-USM(FW)-17-E | Water Main | -33.7 | -70 |
| 39 | 1123-Z2-USFV(FW)-02 | Water Main | -27.1 | -70 |
| 40 | 1123-AC-USM(GP)-18 | Gas Main | -29.5 | -30 |
| 41 | 1123-AB-USM(CM)-21 | Cooling Main | -34.6 | -70 |
| 42 | 1123-AC-USM(CM)-03 | Cooling Main | -47.4 | -70 |
| 43 | 1123-AE-USM(CM)-01-A | Cooling Main | -48.2 | -70 |
| 44 | 1123-AE-USM(CM)-41 | Cooling Main | -43.8 | -70 |
| 45 | 1123-AC-USM(SW)-16-A | Storm Drain | -29.5 | -40 |
| 46 | 1123-Z1-USM(SW)-18-F | Water Main | -33.9 | -70 |
| 47 | 1123-Z3-USM(SW)-01 | Water Main | -48.9 | -70 |
| 48 | 1123-Z3-USM(SW)-02 | Water Main | -40.7 | -60 |
| 49 | 1123-Z1-USFV(SAW)-03 | Water Main | -28.3 | -70 |
| 50 | 1123-AA-GSM-21 | Pavement | -22.6 | -45 |

| | Monitoring Point | Type | Settlement Readings (mm) | Latest pre-set trigger levels (mm) |
|----|-------------------------|--------------|---------------------------------|-------------------------------------------|
| 51 | 1123-Z2-GSM-17 | Pavement | -26.1 | -45 |
| 52 | 1123-AA-GSM-06 | Pavement | -12.1 | -30 |
| 53 | 1123-AC-GSM(USM)-01 | Pavement | -22.6 | -40 |
| 54 | 1123-AC-GSM-01 | Pavement | -16.3 | -30 |
| 55 | 1123-AE-GSM(CM)-35 | Pavement | -22.6 | -50 |
| 56 | 1123-AE-GSM(CM)-48-A | Pavement | -11.5 | -40 |
| 57 | 1123-AE-GSM(FW)-102-B | Pavement | -20.7 | -45 |
| 58 | 1123-AE-GSM-19-D | Pavement | -20.2 | -45 |
| 59 | 1123-AB-GSM-32 | Pavement | -22.8 | -40 |
| 60 | 1123-AB-GSM(USM)-13 | Pavement | -19.8 | -40 |
| 61 | 1123-AB-GSM(USM)-41 | Pavement | -21.1 | -40 |
| 62 | 1123-AB-GSM(USM)-42 | Pavement | -21.8 | -40 |
| 63 | 1123-AB-GSM(USM)-44 | Pavement | -21.5 | -35 |
| 64 | 1123-AB-GSM(USM)-46 | Pavement | -18.2 | -40 |
| 65 | 1123-AB-GSM(USM)-48 | Pavement | -13.5 | -30 |
| 66 | 1123-Z1-GSM-02-A | Pavement | -18.5 | -45 |
| 67 | 1123-Z1-GSM-05-B | Pavement | -22.9 | -35 |
| 68 | 1123-Z1-GSM-39-B | Pavement | -25.7 | -30 |
| 69 | 1123-Z2-GSM-13 | Pavement | -24.3 | -40 |
| 70 | 1123-Z2-GSM-18 | Pavement | -18.4 | -35 |
| 71 | 1123-Z3-GSM-05-A | Pavement | -20.4 | -30 |
| 72 | 1123-Z4-GSM(CM)-26 | Pavement | -18.7 | -40 |
| 73 | 1123-Z4-GSM(USM)-05-C | Pavement | -22.4 | -40 |
| 74 | 1123-AB-USM(CM)-20 | Cooling Main | -15.2 | -70 |
| 75 | 1123-AE-USM(CM)-17 | Cooling Main | -15.1 | -70 |
| 76 | 1123-AE-USM(CM)-42-A | Cooling Main | -10.6 | -70 |
| 77 | 1123-AE-USM(CM)-43-B | Cooling Main | -11.7 | -70 |
| 78 | 1123-AE-USM(CM)-47-A | Cooling Main | -18.1 | -70 |
| 79 | 1123-AE-USM(CM)-56 | Cooling Main | -4.4 | -70 |
| 80 | 1123-AB-USM(FW)-39 | Water Main | -17.9 | -90 |
| 81 | 1123-AA-USM(FW)-01 | Water Main | -10.8 | -90 |
| 82 | 1123-AA-USM(FW)-02 | Water Main | 1.6 | -90 |
| 83 | 1123-AA-USM(FW)-03 | Water Main | 2.3 | -90 |
| 84 | 1123-AC-USM(FW)-02 | Water Main | -13.6 | -90 |
| 85 | 1123-AC-USM(FW)-11 | Water Main | 0.6 | -90 |
| 86 | 1123-AE-USFV(FW)-46 | Water Main | -14.5 | -90 |

| | Monitoring Point | Type | Settlement Readings (mm) | Latest pre-set trigger levels (mm) |
|-----|-------------------------|-------------|---------------------------------|-------------------------------------------|
| 87 | 1123-Z1-USM(FW)-11-B | Water Main | -6.5 | -70 |
| 88 | 1123-Z1-USM(FW)-13-B | Water Main | -13.2 | -50 |
| 89 | 1123-Z1-USM(FW)-15-C | Water Main | -13.6 | -50 |
| 90 | 1123-Z1-USM(FW)-19-D | Water Main | -3.1 | -70 |
| 91 | 1123-Z1-USM(SW)-12-B | Water Main | -1.8 | -70 |
| 92 | 1123-Z1-USM(SW)-14-B | Water Main | -6.3 | -50 |
| 93 | 1123-Z1-USM(SW)-16-C | Water Main | -18.8 | -50 |
| 94 | 1123-Z1-USM(SW)-20-D | Water Main | -4.3 | -70 |
| 95 | 1123-Z3-USFV(SAW)-04 | Water Main | -12.5 | -50 |
| 96 | 1123-Z4-BSM-11 | Building | -1.7 | -50 |
| 97 | 1123-Z4-BSM-12 | Building | -3.6 | -28 |
| 98 | 1123-Z4-BSM-15 | Building | -4.2 | -33 |
| 99 | 1123-Z4-BSM-16 | Building | -6.7 | -33 |
| 100 | 1123-Z4-BSM-17 | Building | -2.2 | -22 |
| 101 | 1123-Z4-BSM-18 | Building | -11.4 | -33 |
| 102 | 1123-Z4-BSM-19 | Building | -7.5 | -50 |
| 103 | 1123-Z4-BSM-20 | Building | -7.4 | -28 |
| 104 | 1123-Z4-BSM-21 | Building | -4.4 | -28 |
| 105 | 1123-Z4-BSM-22 | Building | -2.9 | -28 |
| 106 | 1123-Z4-BSM-27 | Building | -3 | -22 |
| 107 | 1123-Z4-BSM-28 | Building | -2.9 | -20 |
| 108 | 1123-Z4-BSM-29 | Building | -2.2 | -20 |
| 109 | 1123-Z4-BSM-30 | Building | -5.9 | -22 |
| 110 | 1123-Z4-BSM-31 | Building | -7.3 | -22 |
| 111 | 1123-Z4-BSM-32 | Building | -11.3 | -33 |
| 112 | 1123-Z4-BSM-33 | Building | -31.8 | -50 |
| 113 | 1123-Z4-BSM-34 | Building | -22.8 | -50 |
| 114 | 1123-Z4-BSM-35 | Building | -17.9 | -50 |
| 115 | 1123-Z4-BSM-36 | Building | -1.3 | -20 |
| 116 | 1123-Z4-BSM-37 | Building | -2.6 | -20 |
| 117 | 1123-AC-GSM-02-A | Pavement | -15.5 | -40 |
| 118 | 1123-Z4-GSM-15 | Pavement | -20.8 | -50 |
| 119 | 1123-Z4-GSM-16 | Pavement | -19.7 | -50 |
| 120 | 1123-Z4-GSM-18 | Pavement | -19.9 | -50 |
| 121 | 1123-Z4-GSM-19 | Pavement | -12.5 | -50 |

3. Tunnels between Exhibition Centre Station West and Admiralty

| | Monitoring Point | Type | Settlement Readings (mm) | Latest pre-set trigger levels (mm) |
|-----------------------------------------------------------------------------|-------------------------|-------------|---------------------------------|-------------------------------------------|
| 1 | FPP-GSM-032 | Pavement | -** | -25 |
| 2 | FPP-GSM-303 | Pavement | -** | -25 |
| 3 | FPP-GSM-304 | Pavement | -** | -25 |
| ** Settlement readings were re-set to zero after repaving works in Nov 2018 | | | | |

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. Monitoring points such as U124, U215 that have been discontinued before September 2018 are not included in the above list.

土瓜灣站工地考古文物保育方案

附件三 Annex 3

Conservation Options for Archaeological Features Discovered at To Kwa Wan Station



行人隧道 C 的走線 Alignment of Adit C



Existing pedestrian crossing
原有行人過路處