

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

**Progress Update of the Construction of the Shatin to Central Link
(As at 31 March 2020)**

(Translation)

Introduction

This paper reports to Members on the progress of the main construction works of the Shatin to Central Link (“SCL”) as at 31 March 2020.

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. On 5 December 2017, the MTRCL informed the Government of the need to adjust upward the entrustment cost of the main works of the SCL project, from \$70.8 billion to \$87.328 billion. The Highways Department (“HyD”), in

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.

collaboration with the monitoring and verification (“M&V”) consultant, held numerous meetings with MTRCL, and reviewed rigorously the information given by MTRCL as well as the assumptions and basis.

8. After taking into account the views of HyD, MTRCL confirmed with the Government on 21 February 2020 that the entrustment cost estimate for the main construction works of the SCL should be revised to \$82,999.3 million. However, the Government considers the justification submitted by MTRCL for the proposed additional project management cost (about 1,371 million) insufficient as there has been no material modifications to the scope of works, the entrustment activities and/or the entrustment programme of the entrustment agreement, and thus disagrees to any additional project management cost. The Government has adjusted the revised entrustment cost estimate to \$81,628.3 million, which is an increase of \$10,801.3 million over the original entrustment cost, and in other words a reduction of about \$5,700 million compared with the estimate in 2017. After taking into account the original project reserve, expenses funded by other works projects, as well as the M&V consultancy fee and other Government expenses, it is required to increase the total approved project estimate (APE) for 61TR and 62TR by about \$10,063.8 million in order to take forward the remaining works of the SCL project. On 11 May 2020, the Government solicited the PWSC’s support to put forward the application of increasing the APE (i.e. increasing the APE of 61TR by \$8,696.8 million from \$65,433.3 million to \$74,130.1 million in money-of-the-day (MOD) prices; and increasing the APE of 62TR by \$1,367 million from \$5,983.1 million to \$7,350.1 million (in MOD prices)) to the FC Meeting for approval.

Latest Progress of the Main Works

9. The progress report of the SCL project as at 31 March 2020 submitted by MTRCL is at **Annex 2**. Our analysis and supplement on the progress report are provided below.

Tai Wai to Hung Hom Section

Tuen Ma Line Phase 1

10. The works of Hin Keng Station, Diamond Hill Station Extension, Kai Tak Station and the associated railway sections were completed and commissioned. Together with the original Ma On Shan Line, the entire railway from Wu Kai Sha Station to Kai Tak Station is officially named as “Tuen Ma Line Phase 1” and was

put into service on 14 February 2020.

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))

Sung Wong Toi Station

11. Due to the in-situ preservation of the remnants at and in the vicinity of the original Adit C (connecting Sung Wong Toi Station and Pak Tai Street) (i.e. items 6 to 10 of the archaeological features at **Annex 3**), MTRCL commenced a works contract in July 2018 to study the alternative route of Adit C and to carry out the relevant archaeological investigation work. The works contract is anticipated to complete by mid-2021. At present, the archaeological investigation works at both ends of Adit C (alternative route) (i.e. the sites adjacent to Pak Tai Street and Sung Wong Toi Station) were completed; no archeologically valuable findings were discovered. As regards the archaeological site located between Sung Wong Toi Station and Hong Kong Aviation Club, archaeological team discovered archaeological remnants in end-March 2020, including a small stone well and a stone structure possibly dated to Song-Yuan Dynasties, and the remnants of building structure dated to late Qing Dynasty to the Republican Era. Receiving MTRCL's notification, Antiquities and Monuments Office ("AMO") and HyD conducted a site visit on 30 March. The licensed archaeologist engaged by MTRCL would carry out detailed investigation to determine the date and the heritage value of unearthed archaeological remnants. The relevant archaeological discoveries has not affected the target date for the full commissioning of Tuen Ma Line.

12. Subject to the result of the archeological investigation at Adit C (alternative route) mentioned above, MTRCL and HyD will determine whether the extent of the archeological investigation should be expanded, and the specific alignment of the alternative route. Upon completion of the preliminary study on the Adit C (alternative route) 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. If eventually it is unable to construct a suitable and cost-effective alternative route due to further archaeological discoveries or site constraints, residents near Pak Tai Street could still use the existing pedestrian crossing at Sung Wong Toi Road to gain access to Sung Wong Toi Station (see **Annex 4**). MTRCL is constructing an additional

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 Pak Tai Street area and the station entrance/exit. Construction of the at-grade crossing is anticipated to complete by mid-2020.

13. For the purpose of archeological investigation, shallow excavation at the land south of Sung Wong Toi Station was being carried out. MTRCL is carrying out monitoring at relevant settlement monitoring points. The settlement recorded so far is extremely small, and has not exceeded the existing preset trigger levels.

14. Currently, the construction works of Sung Wong Toi Station and the reinstatement of roads in the vicinity of the station were completed. Olympic Garden and Sung Wong Toi Playground were opened for public use in September 2019.

To Kwa Wan Station

15. The works of To Kwa Wan Station was completed. Leisure facilities including Lok Shan Road Playground, To Kwa Wan Complex Playground, Ma Tau Wai Road/San Shan Road Amenity Plot and Ma Tau Wai Road/To Kwa Wan Road Garden were opened for public use. The reinstatement work of a section of Ma Tau Wai Road between Chi Kiang Street and Sheung Heung Road was also substantially completed in the first quarter of 2020.

16. The status of the settlement monitoring points near the To Kwa Wan Station was presented in details at the special meeting of Subcommittee on Matters Relating to Railways on 31 August 2018. Currently, the cumulative settlement of the affected facilities near To Kwa Wan Station, including buildings, public utilities and roads, does not exceed the pre-set or updated trigger levels. The MTRCL would continue to monitor these monitoring points. In view of the public's concerns, in January 2019, MTRCL launched the scheme "To Kwa Wan Station Community Care Programme" on a without prejudice basis for the provision of financial assistance through simplified procedures and practical means to the affected owners of building units in the vicinity of To Kwa Wan Station for repairing walls in their units. The "To Kwa Wan Station Community Care Programme" was concluded by end 2019.

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)

17. E&M installation works adjacent to the railway track in the tunnel of the section from Ho Man Tin Station to Hung Hom Station were completed. For the tunnel section near Princess Margaret Road connecting the East Rail Line and the new platforms of Hung Hom Station, track laying works and E&M installation works adjacent to the railway track were substantially completed.

Commission of Inquiry into the Construction Works at and near the Hung Hom Station Extension under the Shatin to Central Link Project

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

19. The Government announced publicly on 30 January 2019 that some of the works-related documents about the North Approach Tunnels (“NAT”), the South Approach Tunnels (“SAT”) and the Hung Hom Stabling Sidings (“HHS”) were missing and some of the works completed might involve deviations from the designs, plans or drawings accepted by HyD or BD. The Chief Executive in Council approved on 19 February 2019 the expansion of the terms of reference of the Commission to inquire into the above issues.

20. The Commission submitted its Interim Report to the Chief Executive on 25 February 2019, covering its inquiry under the original term of reference. The redacted Interim Report was released on 26 March 2019.

21. The Commission submitted its Final Report to the Chief Executive on 27 March 2020, covering its inquiry under the original and subsequently extended terms of reference. Based on legal considerations, the Government partially redacted seven paragraphs in the Executive Summary and the main body of the Final

Report, to avoid any prejudice (actual or perceived) to relevant criminal investigations and any potential prosecutions of any criminal offences in the future (if so decided to be justified after the relevant investigations). The Government released the redacted version of the Final Report on 12 May 2020.

22. In addition, the Government appointed an independent audit panel (“the Panel”) in October 2019 to conduct independent follow-up audit on the progress of implementation of the measures recommended in the Commission’s Interim Report. The Panel submitted its audit report to the Chief Executive on 26 May 2020, and the report was uploaded to the website of the Transport and Housing Bureau (<https://www.thb.gov.hk/eng/psp/publications/transport/studies/index.htm>) on 3 June 2020.

23. The key findings and recommendations of the Final Report, the Government’s response, and the key audit findings of the Panel are given in **Annex 5**.

Holistic Assessment for Hung Hom Station Extension and Verification Works of North Approach Tunnels, South Approach Tunnels and Hung Hom Stabling Sidings

24. Since MTRCL has failed to submit comprehensive as-constructed records including the working drawings used during construction to ascertain the as-constructed condition and clarify the quality of works where there were honeycomb etc, the Transport and Housing Bureau (“THB”) and its Expert Adviser Team (“EAT”), relevant government departments, experts of the Department of Civil Engineering and the Department of Statistics and Actuarial Science of the University of Hong Kong (HKU) and MTRCL have held several meetings to discuss the solutions. The Government requested MTRCL to formulate a holistic strategy to verify the condition of the platform slab structure of the Hung Hom Station Extension.

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

comprehensive review and analysis of the structural safety and integrity of the entire Hung Hom Station based on the verification results of the first and second stages to ascertain if the overall structural integrity of the works is acceptable and determine if it is necessary to carry out strengthening works. On 5 December 2018, the Government accepted the proposed holistic assessment strategy submitted by the MTRCL regarding the platform slabs and diaphragm wall of the Hung Hom Station Extension under the SCL.

26. The opening-up of concrete and the Phased Array Ultrasonic Tests (“PAUT”) under the second stage were completed on 29 April 2019. The relevant results have been uploaded to the Highways Department's website for the SCL project for reference by the public. MTRCL also completed the works in the third stage of the holistic assessment strategy. On 18 July 2019, the Government scrutinized and accepted the MTRCL’s final report on the holistic assessment strategy for the Hung Hom Station Extension. The report was submitted to the Commission and uploaded to the Highways Department's website for the SCL project

(https://www.hyd.gov.hk/en/road_and_railway/railway_projects/scl/index.html) on the same day for reference by the public. According to the final report, MTRCL proposed suitable measures to address poor workmanship issues and to attain the requirements of the Code of Practice for Structural Use of Concrete under the Buildings Ordinance (“BO”) as well as established good practice of engineering design. The suitable measures including drilled-in bars, local thickening of slabs, reinstatement of shear links, addition of columns, grouting, etc, are proposed to address the workmanship issues of coupler connections, shear links, horizontal construction joints, seepage, etc. MTRCL completed the design of the suitable measures in September 2019, commenced the relevant works in November 2019 and expected to complete the suitable measures in mid-2020. MTRCL would develop a long-term structural monitoring scheme as part of the suitable measures including instrumentation and inspection to monitor the ongoing structural integrity of the structure. MTRCL is further developing the details of the long-term structural monitoring scheme, and will submit to the Government for acceptance.

27. Apart from Hung Hom Station, the Government checked the major structural works of other stations under the SCL project to confirm if there were quality issues similar to those at the Hung Hom Station Extension. Under the supervision of the EAT of THB, HyD and the M&V consultant completed a review of the works of Tai Wai Station, Hin Keng Station, Diamond Hill Station, Kai Tak Station, Sung Wong Toi Station and To Kwa Wan Station along East West Corridor

under the SCL project focusing on the deficiencies of the records related to quality control of works and site supervision. MTRCL was informed of the findings, and was requested to investigate into the deficiencies identified during inspection for proposing remedial actions. Besides, MTRCL voluntarily conducted an internal audit on the major works of Tai Wai Station, Hin Keng Station, Diamond Hill Station, Kai Tak Station, Sung Wong Toi Station, To Kwa Wan Station and Ho Man Tin Station. Result shows that about 90% of the structure related Request for Inspection and Survey Check (“RISC”) forms are available. These results are generally consistent with the findings of the sampling audit conducted by the M&V Consultant. MTRCL conducted an investigation into the incomplete construction records and proposed to the Government relevant remedial actions including the employment of independent Registered Structural Engineer and the regular monitoring of relevant station structures after the commissioning for assurance of the structural safety.

28. Regarding the issues announced on 30 January 2019 (see above paragraph 19), the Government sternly requested MTRCL to provide a detailed account of the case; review whether there are similar problems in other parts of the relevant contract; submit a holistic study to ascertain the as-constructed conditions; and assess the programme implications on the full or partial commissioning of the Tuen Ma Line. On 7 May 2019, MTRCL submitted a Verification Proposal of As-Constructed Conditions of the NAT, SAT and HHS to HyD. After discussions with EAT, HyD and BD, MTRCL submitted a revised Verification Proposal to HyD on 15 May 2019. The Government accepted the Verification Proposal on 15 May 2019, and urged MTRCL to expedite the verification works. The Proposal consists of two parts. Part one consolidates and verifies available construction records; and reviews and ascertains as-constructed conditions of the structures. Part two conducts a structural review. The Government scrutinized and accepted the MTRCL’s final verification study report on as-constructed conditions of the NAT, SAT and HHS on 18 July 2019. The report was submitted to the Commission on the same day and uploaded to the Highways Department's web page for the SCL project

(https://www.hyd.gov.hk/en/road_and_railway/railway_projects/scl/index.html)

for reference by the public. Based on the results of the structural review in the final verification study report and to ensure structural integrity, MTRCL proposed suitable measures at certain locations at the SAT under the North South Line and trough walls of the HHS. MTRCL completed the design of the suitable measures in September 2019, commenced the relevant works in October 2019 and expected to complete the suitable measures in mid-2020.

Hung Hom to Admiralty Section

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

29. The overall progress of the cross harbour tunnel section is generally on schedule. The E&M installation works adjacent to the railway track inside the cross harbour tunnel continued.

30. Upon completion of the phased seabed improvement works in the Causeway Bay Typhoon Shelter (CBTS), MTRCL would gradually start re-arranging the permanent mooring of vessels affected by the previous works. MTRCL would continue communicating with relevant government departments and stakeholders within CBTS.

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

31. The major ongoing construction activities at the Hong Kong Island Section comprise the structural works at the Exhibition Centre Station and Western Approach Tunnels, remaining foundation works (including supports to the connecting footbridges to the future station, some re-provisioned facilities at Wan Chai Sports Ground and the topside development) and the construction of basement at the second level for the West Ventilation Building located at Fleming Road.

32. To facilitate the remaining construction works of the Exhibition Centre Station, it is necessary to continue the temporary traffic management measures in stages at Wan Chai North. MTRCL plans to complete the re-provisioning of the remaining section of the permanent footbridge at Convention Avenue connecting to Wan Chai Ferry Pier and the subsequent demolition of the associated temporary footbridge by the fourth quarter of 2020. By then, Convention Avenue would be temporarily closed for several nights.

33. The details about the settlement monitoring points in Wan Chai North were presented at the special meeting of Subcommittee on Matters Relating to Railways on 31 August 2018 as well as the subsequent quarterly progress update. According to MTRCL's monitoring data, the cumulative settlement of the affected facilities near Exhibition Centre Station, including buildings, public utilities and roads, does not exceed the pre-set or updated trigger levels. As at 31 March 2020, the updated pre-set trigger levels are listed in MTRCL's progress report (Enclosure IV of **Annex**

2).

34. MTRCL completed an internal audit on the major works of Exhibition Centre Station. Result showed that about 90% of the structure related RISC forms were available; the results were similar to those of internal audit on stations along East West Corridor. Under the supervision of the EAT of THB, HyD and the M&V Consultant completed the review of the records related to quality control of works and site supervision at Exhibition Centre Station. The findings of the sampling audit conducted by the M&V Consultant and the overall result of internal audit by MTRCL are generally consistent.

Impact of COVID-19 Pandemic on Construction Works

35. Since early 2020, COVID-19 has spread across the globe and works progress has been affected. Construction workers returning to Hong Kong from mainland China after the Chinese New Year should be quarantined for 14 days; the supply of construction materials (including aggregates for concrete production) was affected due to the suspension of work in mainland China; other activities related to the project were also affected by the anti-epidemic measures taken by other countries. For instance, MTRCL resident staff in Korea responsible for new train inspection had to return to Hong Kong. MTRCL is assessing the ultimate impact on the construction works progress.

Conclusion

36. In view of the assessments as mentioned in paragraphs 9 to 35 above, taking into account the delay of about 11 months to the “Tai Wai to Hung Hom Section” of SCL arising from the archaeological works, archaeological discoveries and conservation options for archaeological features at Sung Wong Toi Station from 2012 to 2014, the commissioning date of “Tai Wai to Hung Hom Section” was deferred to end 2019. With the implementation of delay recovery measures, the target commissioning date of the “Tai Wai to Hung Hom Section” could originally be advanced to mid-2019. However, due to the series of incidents related to the quality of works of the Hung Hom Station Extension revealed in May 2018, it is required to carry out associated investigation works and implement the suitable measures. The target commissioning date of the “Tai Wai to Hung Hom Section” had to be deferred to the end of 2021.

37. To ensure the public enjoyment of the new railway as soon as possible, the

Government accepted the proposal from MTRCL to duly commission of three new stations, namely Hin Keng Station, Diamond Hill Station Extension and Kai Tak Station. Passengers of Ma On Shan Line could commute directly to the three new stations via Tai Wai Station and the entire railway from Wu Kai Sha Station to Kai Tak Station is now officially named as “Tuen Ma Line Phase 1”, which was put into service on 14 February 2020. The Government has been urging MTRCL to commission fully Tuen Ma Line as soon as possible. After reviewing the latest progress, MTRCL should be able to advance the commission of the remaining “Kai Tak to Hung Hom Section” to the third quarter of 2021.

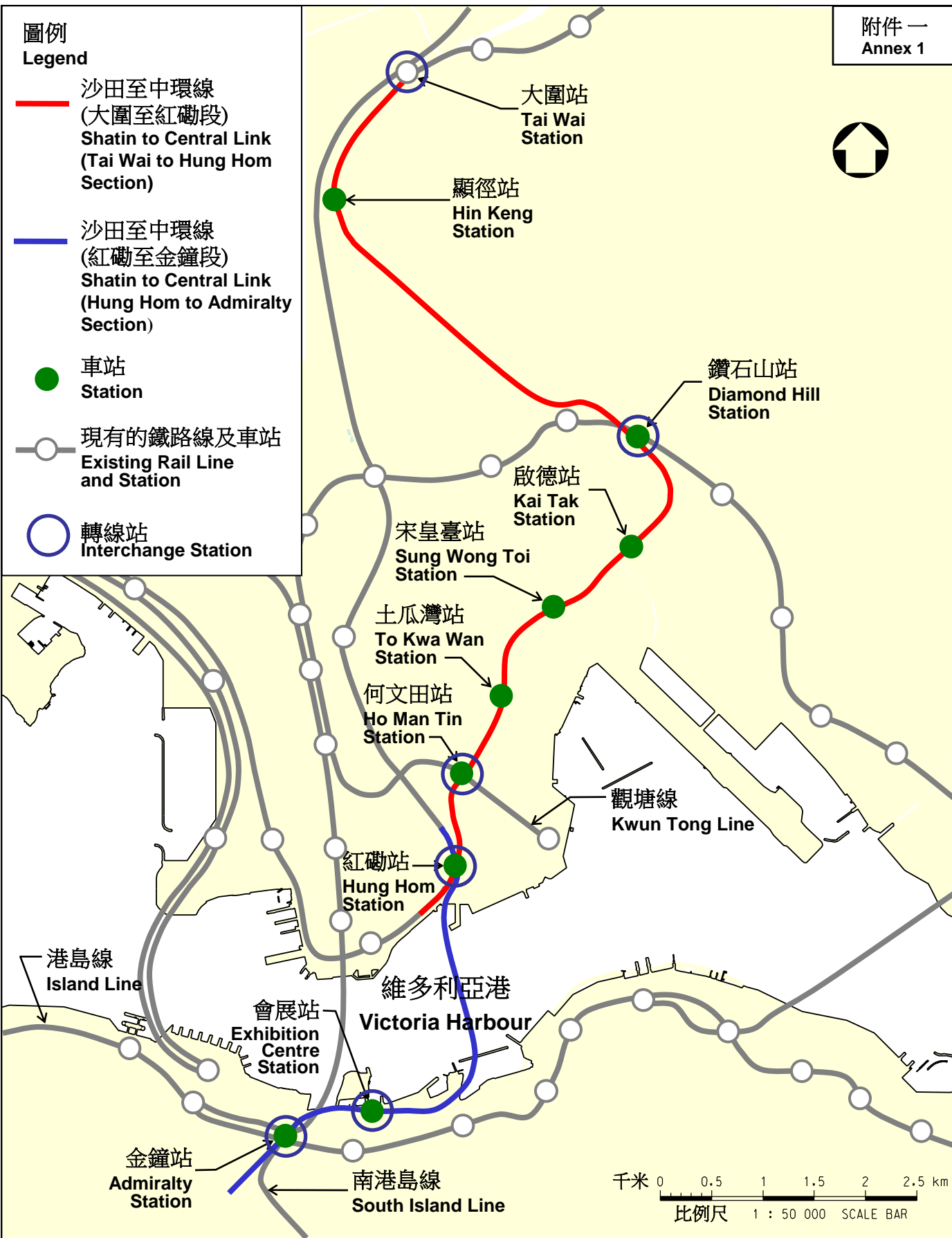
38. As regards the North South Corridor² of the SCL project, given the impact of site handover arrangement under the Wan Chai Development Phase II project, complicated ground conditions below Exhibition Centre Station, settlement causing a suspension of the excavation works at the Exhibition Centre Station, as well as the allowance of flexibility for the development atop Exhibition Centre Station, the target commissioning date had previously been revised to 2021. Since the East Rail Line (EAL) is part of the North South Corridor, its signaling system has to be upgraded under the SCL Project. Since October 2019, there had been multiple damages to the EAL facilities necessitating emergency inspections, maintenance and cancellation of works originally planned during non-traffic hours. The project team was thus unable to carry out the train test of new EAL signaling system as scheduled, subsequent conversion works for the 9-car trains, and track bifurcation works. As the new signaling system for EAL is a critical activity under the North South Corridor, MTRCL considered that the commissioning date for Hung Hom to Admiralty Section had to be deferred to the first quarter of 2022. In addition, MTRCL reported to HyD that there were serious damages to the facilities at the University Station of EAL and adjacent railway section in November 2019. The newly installed facilities for the signaling and E&M systems under the North South Corridor were also severely damaged. The extent being affected exceeded 4 kilometres. After several months of repairs, the MTRCL completed substantially the replacement and re-installation of damaged facilities; and was re-testing the works. HyD and MTRCL are reviewing the construction schedule and exploring the feasibility of accelerating key activities.

Transport and Housing Bureau
Highways Department
June 2020

² North South Corridor is composed of the existing East Rail Line and the newly-built Hung Hom to Admiralty Section under the SCL Project. It will be renamed as the East Rail Line after commissioning.

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 31 March 2020)**

INTRODUCTION

This report updates Subcommittee members on the progress of Shatin to Central Link (“SCL”) as at 31 March 2020.

OVERVIEW OF THE SCL PROJECT

Works progress

2. As at 31 March 2020, the overall works for SCL were 93% complete. Over 99% of the works of the Tai Wai to Hung Hom Section have been completed. Hung Hom to Admiralty Section is 85% complete.
3. Tuen Ma Line (“TML”) Phase 1 covering two new stations at Hin Keng and Kai Tak and an extension at Diamond Hill Station was successfully opened on 14 February 2020. It provides an alternative linkage between the New Territories East and Kowloon East, extending railway service to new communities in the Kai Tak area and providing passengers with a safe, reliable and comfortable mode of public transport through the new interchange at Tai Wai and Diamond Hill stations.
4. Preparation for TML full line opening is underway. Implementation of the suitable measures at Hung Hom Station is in progress, targeting completion in June 2020. Following completion of the suitable measures in Hung Hom Station and subsequent services reinstatement activities, testing and commissioning of the railway systems will proceed. Full TML opening is expected to be in the third quarter of 2021.
5. In preparation for the extension of the East Rail Line (“EAL”) across the harbour to Admiralty, critical projects and operational activities on EAL will be carried out starting in mid-2020. These include the commissioning of the new signalling system on EAL and mixed fleet operation to replace the 12-car EAL trains with 9-car trains progressively.

Another critical piece of work is the track bifurcation work, i.e., realignment of the EAL north of Hung Hom Station to bring EAL trains to the new Hung Hom platforms and cross-harbour tunnel, targeted to commence in the third quarter of 2020. Full line dynamic testing and reliability testing will then be conducted, followed by trial operations and finally commencement of passenger service.

6. As previously mentioned, installed equipment in the vicinity of University Station on EAL, including the new signalling control system for the Hung Hom to Admiralty Section, sustained serious damage from public order events in recent months. The need to repair this equipment during night time non-traffic hours has reduced the night time non-traffic hours working windows available for other SCL work, including signalling testing. Repairs to the new signalling system were completed in March 2020.

7. On Hong Kong Island, the majority of structural works of Hung Hom to Admiralty Section have been completed with the exception of Exhibition Centre Station, where a complex sequence of structural engineering activities is being undertaken. Following delays previously reported, delay recovery measures continue to be implemented, including the deployment of additional resources and extended working hours within the allowable period. These are having some beneficial effect, but recovery is still a challenge given the complex nature of the works and difficult logistics in the work site. The programme for Exhibition Centre Station is close to being critical and its progress is being closely monitored while exercising with the delay recovery measures.

8. The COVID-19 pandemic is adversely impacting construction progress due to disrupted materials supply from Mainland factories, which have not yet fully resumed after the Chinese New Year holidays. In addition, quarantine requirements overseas and locally have resulted in working restrictions on contractors' labour force and overseas engineering experts. These constraints have impacted manpower and process arrangements as well as delivery of key components and material supplies. To manage the difficulties, a number of measures have been implemented to minimise the impact, including utilisation of local support, identifying alternative suppliers of materials from other countries and the use of technology to facilitate remote inspections.

9. Taking account of matters referred to above, the targeted commencement of passenger services on the Hung Hom to Admiralty

Section (East Rail Line extending to Admiralty Station) in the first quarter of 2022 is a challenge. Efforts continue to be made to meet the programme.

Outstanding non-railway works under TML Phase 1

10. At the Wong Tai Sin Public Transport Terminus (“PTT”), statutory inspections are substantially complete. The coach parking area at the upper deck was handed over to the relevant government department and opened for public use. The design of the ingress and egress of lower deck of the PTT connected with Shatin Pass Road was revised as requested by relevant government departments. The corresponding temporary traffic management schemes are expected to be implemented at a later stage.

11. To facilitate SCL works, part of the Ma Chai Hang Recreation Ground was demolished to make way for the ventilation building and emergency vehicular access between Hin Keng and Ma Chai Hang railway tunnels. After the completion of the related railway works, re-provisioning works of the Ma Chai Hang Recreation Ground will proceed. The tender process for the detailed design consultancy is in progress.

Progress in other sections of SCL

(i) Sung Wong Toi and To Kwa Wan stations

12. Statutory inspections and all external finishing work at entrances for Sung Wong Toi and To Kwa Wan stations are complete.

13. As mentioned in previous reports, the archaeological works at Sung Wong Toi Station 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, such as re-sequencing the works and adjustment in site interface management, recovered some of the delays.

14. Due to archaeological discoveries at Sung Wong Toi Station, the subway adit connecting Pak Tai Street could not be constructed according to the original plan. A separate archaeological survey is being carried out to assess the feasibility to providing a passenger connection to Pak Tai Street. The archaeological survey is complete on Pak Tai Street near Sung Wong Toi Road and is now progressing in the location adjacent to Hong Kong Aviation Club (“HKAC”), with a target completion date by end 2020 or early 2021. Subject to the archaeological findings, the survey may be extended to Sung Wong Toi Road and inside HKAC to confirm the feasibility of an alternative alignment.

15. In late March 2020, some archaeological remains including a small stone well and a stone structure probably dating back to Song/Yuan Dynasty, and building remains dating from the late Qing period were discovered at the location between Sung Wong Toi Station Entrance D and the HKAC. Joint inspection with Antiquities and Monuments Office (“AMO”) was arranged. The archaeological survey continues and classification of the remains is pending further study by the relevant licensed archaeologist. Throughout the process, all archaeological finds and archives are being handled according to the AMO’s Guidelines for Handling of Archaeological Finds and Archives.

16. To provide an interim connectivity to Sung Wong Toi Station upon full opening of the TML, a temporary at-grade crossing at Sung Wong Toi Road near Tam Kung Road is being constructed. It is expected this will open for public use in mid-2020.

17. For works related to To Kwa Wan Station, permanent reinstatement of the previously affected public utilities along Ma Tau Wai Road and nearby roads such as water mains, drainage system, electrical cables and roads is being carried out in phases. Reinstatement of amenity facilities including Nam Kok Road footpath, Sung Wong Toi Playground, Olympic Garden, Lok Shan Road Playground, To Kwa Wan Complex Playground and Ma Tau Wai Road/ To Kwa Wan Road Garden which are previously occupied for SCL works are substantially complete and most of them are already open for public use. Permanent reinstatement works at Ma Tau Wai Road are substantially complete. The number of traffic lanes has been reinstated back to six lanes dual carriageway, except a southbound section between Lok Shan Road and Sheung Heung Road.

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

18. Statutory inspection for the tunnel connecting Ho Man Tin and Hung Hom stations is complete except for the at grade approach section connected into Hung Hom Station. For the mainline tunnel connecting the existing EAL to the extension of Hung Hom Station to form the cross-harbour EAL, structural works, track work and E&M installation are substantially complete.

19. With completion of all tunnel structures, the related temporary traffic management schemes along Chatham Road North, Winslow Street

underpass slip road as well as Hong Chong Road slip road have been completed and re-opened for use. Reinstatement of Oi Sen Path walkway and amenity area is also complete and open for public use.

20. E&M works, building services and fitting out work for the future TML platforms built under the existing Hung Hom station podium are substantially complete, ready for testing and commissioning. Modification works in the existing station to accommodate future station re-arrangements, including architectural builders works and finishes, building services, and new escalators and lifts are substantially complete.

21. New EAL platforms under the existing Hung Hom Station podium have been constructed to facilitate the EAL extension across Victoria Harbour to Hong Kong Island. To connect the existing railway section south of Mong Kok East, including tracks, overhead lines and associated systems, to the new railway north of Hung Hom Station Extension, track realignment, also known as bifurcation work, is required. The bifurcation work is targeted to commence in the third quarter of this year and is critical to the completion of the Hung Hom to Admiralty Section in the first quarter of 2022.

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

22. To extend the existing EAL across Victoria Harbour to Hong Kong Island, a new cross-harbour rail tunnel has been built by Immersed Tube Tunnel method. Following completion of track laying in October 2019, installation of overhead line is now also complete, while other E&M installation works including trackside auxiliaries are progressing.

23. At Hung Hom, construction and fire service inspections of the North Ventilation Building are complete.

24. Marine work in the Causeway Bay Typhoon Shelter (“CBTS”) for SCL has been completed. To suit the schedule of the seabed improvement works in CBTS by another government infrastructure project, moorings in CBTS will be reinstated in phases. Currently the Phase 1 reinstatement of mooring arrangements for the Royal Hong Kong Yacht Club is on-going. The Corporation will continue to liaise with the Marine Department and relevant stakeholders to ensure the mooring arrangements are coordinated to minimise any impact.

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

25. The tunnels between CBTS and Exhibition Centre Station are structurally complete. Track laying works are also complete while E&M installation works are underway.

26. At the South Ventilation Building works site near CBTS, construction of the super-structure of ventilation building and the re-provisioned Police Officers' Club as well as E&M and building services installation works are progressing.

27. At the Tunnel Approach Rest Garden near CBTS, reinstatement of the rest area and recreational facilities is progressing. Tree planting works are substantially complete, while hard landscaping works and installation of recreational facilities are being carried out. Relevant reinstatement works are expected to complete in 2020.

28. Structural work and track laying for tunnels between Fenwick Pier Street and Admiralty Station are complete, overhead line installation will follow.

29. In Wan Chai North area, construction works for Exhibition Centre Station and the relevant railway facilities are on-going. To facilitate SCL construction works and the road construction works entrusted to the SCL project to facilitate road planning for Wan Chai North by the relevant Government departments, temporary traffic management schemes continue to be implemented in stages.

30. Following completion of bulk excavation works for Exhibition Centre Station and the Western Approach Tunnel in June 2019, the remaining foundation works, including piling works to facilitate the station entrance and nearby facilities, are being carried out progressively. As unexploded bombs were discovered during excavation in the works sites previously, the project team is working cautiously to ensure safety and minimise risk. In the meantime, structural works for the Western Approach Tunnel are substantially complete. Remaining structural works for Exhibition Centre Station, including the construction of the upper and lower platform levels, station concourse as well as the ventilation facility are in full swing. E&M installation and fitting-out works have commenced at platform levels.

31. As reported previously, construction works have been affected by various factors, including initially delayed handover of critical works areas under the Wan Chai Development Phase II ("WDII") project in Wan Chai

North, the need to allow flexibility for future topside development above Exhibition Centre Station, the requirement for which was introduced after commencement of the Project, and the section of diaphragm wall cofferdam entrusted to WDII not being completed in accordance with the design. Progress was also affected by the discovery of three wartime bombs in the site and the subsequent temporary suspension of excavation, and additional controls being introduced for excavation works. We continue to implement delay recovery measures, including the deployment of additional resources and extended working hours within the allowable period. These are having some beneficial effect, but recovery is still a challenge. The effectiveness of the delay recovery measures is being closely monitored and further measures are being investigated.

32. Subject to works progress, the footbridge across Convention Avenue is expected to be reinstated in the fourth quarter of 2020. The existing temporary footbridge will be dismantled after opening of the new permanent footbridge.

33. The 900-metre overrun tunnel extending southwards from the SCL platform at Admiralty Station for future train regulation is complete and track laying works are also complete. E&M installation works are underway and will be followed by overhead line installation. Reinstatement work at the Hong Kong Park works site is substantially complete. Building services installation and vertical greening works are being carried out for the ventilation building at Hong Kong Park.

34. Architectural finishing works, building services, and E&M work including escalator installations for the extended Admiralty Station are all in progress.

QUALITY AND SAFETY OF SCL CONSTRUCTION WORKS

Verification and assurance of Hung Hom Station Extension

Holistic assessment strategy for Hung Hom Station Extension

35. Safety and quality of railway projects have always been top priorities of the Corporation and safety of the public and site workers has at no time been compromised. In response to allegations of poor workmanship, in order to provide assurance to the public's concerns on the structural safety of the Hung Hom Station Extension, the Corporation engaged external

consultants to develop a set of measures to assess and verify the integrity of the station. In December 2018, Government accepted the Corporation's holistic proposal with a three-stage approach to verify the as-constructed conditions and the workmanship quality of the diaphragm walls, the EWL and NSL slabs to diaphragm wall connection.

36. After completion of the three-stage verification, which included a review of available construction records, on site physical investigation including the opening up and testing of coupler connections using Phased Array Ultrasonic Testing ("PAUT") and structural assessment, the Final Report on Holistic Assessment Strategy for the Hung Hom Station Extension was released in July 2019 after acceptance by Government and its Expert Adviser Team. The report concludes that the station structure is safe for the purpose of the ongoing construction activities, but suitable measures will be implemented to address workmanship issues and to achieve code and contractual compliance. In addition, an appropriate long-term monitoring scheme will be considered to monitor the ongoing structural integrity of the station.

Verification study on as-constructed conditions of adjacent structures of Hung Hom Station

37. In view of information gaps identified in construction records, i.e. some Request for Inspection and Survey Check ("RISC") forms for the construction of works adjacent to the Hung Hom Station, namely the North Approach Tunnels ("NAT"), South Approach Tunnels ("SAT") and Hung Hom Stabling Sidings ("HHS"), were not available from the Contractor, Leighton Contractors (Asia) Limited, the Corporation carried out a verification study of the as-constructed condition of the concerned structures. The purposes of the study were to verify the construction records and ascertain the as-constructed condition, and to conduct a structural review and devise any necessary remedial works and an appropriate long-term monitoring scheme.

38. The Final Report was also submitted to Government in July 2019. The conclusion, which has been accepted by Government, is that the structures are safe for the purpose of the ongoing construction activities, but suitable measures will be implemented to address workmanship issues at certain locations in SAT and HHS to achieve code and contractual compliance. Subsequently, a long-term monitoring scheme will be considered to monitor the ongoing structural integrity of the structures.

Suitable measures

39. After a thorough review, detailed designs of the suitable measures at the platform slabs and tunnel structures under Hung Hom Station Extension as well as SAT and HHS structures were accepted by Government in October and November 2019. The scope and extent of the suitable measures were carefully designed by the consultant designer taking into consideration the actual constructed conditions and by carrying out a more sophisticated and detailed structural modelling.

40. Implementation of the suitable measures commenced in October 2019 following Government's acceptance of the design. The work involves a combination of slab and wall thickening, additional dowel bar reinforcement, and some additional columns and struts. The works at HHS and EWL level of Hung Hom Station Extension have been completed. Works at SAT and NSL level of the Hung Hom Station Extension is progressing satisfactorily with a target to complete in June 2020. A dedicated supervision team has been deployed on site to oversee the works to ensure they are in line with the site supervision plan. In addition, a digital system for better monitoring and control of site records is being used in supervision of the works. Reinstatement of the tracks and E&M systems is being carried out progressively at locations where suitable measures have been completed. Following completion of the reinstatement activities, testing and commissioning of the railway systems will proceed.

Verification of other new stations

41. As previously reported, the Corporation also completed an independent audit of key documentation for the five TML new stations, namely Hin Keng, Diamond Hill, Kai Tak, Sung Wong Toi and To Kwa Wan. Audit results show that over 90% of the structure related RISC forms are available, while further supplementary evidence, such as record photographs and site diaries, has been identified to demonstrate the completed works on site were adequately supervised. (Please refer to **Enclosure III**).

42. At Exhibition Centre Station, independent audits of key documentations have been conducted. Audit results show that about 90% of the structure related RISC forms are available. A digital RISC form system has been implemented since February 2019; ongoing audits demonstrate that RISC forms for Exhibition Centre Station since the introduction of the digital system are 100% available and in order.

Commission of Inquiry (“CoI”) into the Construction Works at and near the Hung Hom Station Extension

43. The final report of the CoI was released by the Government on 12 May 2020. The final report has concluded that the relevant structures at and near Hung Hom Station Extension are safe and fit for purpose with the completion of the suitable measures.

44. The Corporation notes that the Commission, in its final report, has identified a number of inadequacies in respect of the construction process and made recommendations on the Corporation’s project management practices. Based on the recommendations of the review conducted by the Capital Works Committee (“CWC”) under the MTR’s Board, aided by an external consultant, and the Commission’s interim report, the Corporation has been updating and improving a number of its project management practices over the past two years. Many of these have already been incorporated into the Corporation’s standard practices. Improvements already forming part of the Corporation’s project management approach include an enhanced quality management process and organisational structure, the use of digital technology to improve the inspection process and monitoring, and enhanced staff training. Further improvements are being developed, including longer term changes to the way the Corporation will manage future projects, an example being the use of Building Information Modelling (“BIM”) and the New Engineering Contract Version 4 (“NEC4”) both of which are being adopted in the design consultancy for the Tung Chung Line Extension, which will shortly be awarded.

45. The Corporation has also been working with the Government to further foster collaboration with improvements in communication at site and managements levels already implemented.

46. We will review the findings and recommendations of the final report and implement further follow-up actions as necessary.

47. The Corporation notes that the Commission also finds that elements of the construction works were not executed in accordance with the contract. These issues will be resolved in accordance with the terms of the relevant contracts.

Review conducted by CWC

48. As mentioned in Paragraph 44, the CWC has already reviewed the Corporation's project management system. The external consultant appointed by the CWC to undertake the review developed a number of recommendations. Since late 2018 the Corporation has been progressively implementing these recommendations to enhance the Corporation's project management.

49. The recommendations made by the external consultant cover six aspects, including:

- organisation and governance;
- the Corporation's project management processes and procedures;
- quality management;
- the use of digital tools and technology;
- capability management; and
- commercial and contracting strategy.

50. Most of the recommendations are in place and have become an integral part of the Corporation's management practices for delivering the current and future projects. For instance, a new quality management team is in place to enhance quality performance and operate as an independent "second line of defence"; new Non-conformance reports ("NCR") reporting system within the Corporation and with Government; monitoring and verification procedures are updated and made clearer and new enhanced training has been introduced for site supervision teams including refresher training for staff with statutory responsibilities under the Quality Supervision Plans and Site Supervision Plans. The introduction of a new digital reporting and supervision system, including RISC, NCR processes, site diaries and photographic records has also been made since early 2019. Some of the recommendations relate to future activities; these will be implemented as the Corporation embarks on new projects.

Measures taken to address the settlement issue adjacent to SCL stations

51. The Government announced in September 2018 a notification mechanism for the monitoring of 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 reaches or exceeds the pre-set trigger levels for the temporary suspension of work. The Corporation continues to work closely with the Government in accordance with the mechanism.

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

53. Since the resumption of excavation works for Exhibition Centre Station in September 2018, no monitoring readings have reached or exceeded the pre-set trigger levels. Bulk excavation works were completed in June 2019. Monitoring will continue for some time until the settlement readings have become stable after completion of the underground structure and backfilling works, providing assurance as to the on-going safety of nearby buildings, structures and facilities.

54. For To Kwa Wan Station, Registered Structural Engineers were deployed to assess the safety conditions of nearby buildings which were alleged to be affected by the settlement near the station works sites. The concerned buildings are confirmed to be safe.

55. The Corporation funded a community care programme in the first half of 2019 to provide financial support to the owners of the residential buildings near the construction sites of To Kwa Wan Station to carry out the repair works. A professional building surveyor consultant was appointed to administer and manage the execution of the programme, which was concluded in December 2019.

IMPROVEMENT WORKS FOR THE OPERATING RAILWAY FACILITIES

Tuen Ma Line

56. To facilitate the 8-car train operation for TML, new 8-car trains have been procured and all 17 sets of new trains were delivered to Hong Kong by November 2018. In addition to the new trains, some of the existing train cars on former Ma On Shan Line (“MOL”), West Rail Line (“WRL”) and EAL have also been modified to form the 8-car train fleet for TML.

57. All former 4-car MOL trains and 7-car WRL trains were upgraded and converted to 8-car trains by December 2017 and May 2018 respectively to prepare for 8-car train fleet for TML. Subsequent to the commissioning of TML Phase 1 in February this year, three sets of TML new trains have been introduced into passenger service on WRL since

March 2020 to facilitate the future 8-car train fleet operation.

58. The retrofitting of a total of 720 pairs of Automatic Platform Gates (“APG”) at all 9 stations of the former MOL is also complete.

East Rail Line

59. In preparing for the extension of the EAL across Victoria Harbour to Admiralty, critical works will be carried out on EAL gradually starting in mid-2020, including the commissioning of the new signalling system, the introduction of new 9-car trains into passenger service, and bifurcation works, i.e. track realignment between Mong Kok East and Hung Hom stations.

60. Replacement of the EAL signalling system commenced in the third quarter of 2015. Dynamic testing commenced by sections in 2016 and was extended to the full line in 2018, followed by reliability testing in the second half of 2018. Normal train operation patterns, including those in peak periods, were simulated to ensure a smooth operation of the new signalling system and new trains in the future. Much of the work has to be conducted in non-traffic hours at night, and these activities were disrupted by the large-scale public order events and associated damage to the existing railway. The night time possessions available for SCL work, including 9-car and 12-car mixed fleet activities and signalling testing, has therefore been reduced. Following the re-opening of University Station in December 2019, repairs were carried out to the equipment of new signalling system. The repair works were completed in March 2020 and all testing and safety validation of the new signalling system are expected to be completed in mid-2020.

61. To accommodate the space constraints of the new platform layouts on Hong Kong Island, 37 sets of new 9-car trains have been procured and are being delivered to Hong Kong progressively. Stringent testing and commissioning of the delivered new trains is underway. The new trains, with a wider body and newly designed handrails as well as a LED lighting system, will provide a more spacious and comfortable travelling environment. They are also equipped with dynamic route maps and gangway displays which provide more information for passengers during their journeys. The locations of the doors of the new trains are also improved, being evenly spaced along the trains, bringing more convenience to passengers when alighting and boarding.

62. Starting in mid-2020, the new 9-car trains will gradually replace the existing 12-car trains under a programme that will take place in phases over the coming 18 months. During the conversion period when both the existing 12-car trains and new 9-car trains will run on EAL, this also being known as mixed fleet operations, comprehensive measures will be introduced to facilitate passenger familiarisation with the arrangements, including passenger information displays, giant signage and floor labels on platforms, enhanced public announcements and additional manpower to assist passengers.

63. As mentioned in paragraph 21, trackwork realignment, also known as bifurcation work, will also be carried out between Mong Kok East and Hung Hom stations to connect the existing EAL to the new SCL platforms at Hung Hom Station Extension and the newly built cross-harbour rail tunnel. Preparation is in hand with a target to commence in the third quarter of 2020.

64. Apart from the replacement of the new signalling system and new trains, retrofitting of APGs will also be carried out at all EAL stations. Before the APG retrofitting, platforms need to be strengthened and equipment rooms for the relevant signalling system and facilities constructed. These preparatory works are substantially complete and some early preparation for the retrofitting is underway. Due to the different door locations on the new 9-car trains, the installation of the new APGs can only commence when the train fleet of the EAL is fully replaced by the new 9-car trains.

COSTS

Cost and expenditure

65. Since mid-2012, 28 major civil and 30 major E&M contracts¹, together with other minor contracts, have been awarded with a total sum of \$57.834 billion. The contract sums for civil works and E&M works are about \$43.932 billion and \$13.902 billion respectively (Please refer to **Enclosure I**).

66. 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.

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.

Cost control mechanism

67. 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.

68. 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.

69. To enhance the control of expenditure, the Corporation has its Project Control Group ("PCG") as 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 attend the PCG meetings.

70. Where the progress of works has been delayed, the Corporation considers implementing delay recovery measures as appropriate. Proposals for delay recovery measures including the cost and benefits implications are reviewed and approved by PCG prior to implementation.

Latest estimate of Cost to Complete ("CTC")

71. In February 2020, the Corporation completed its further review and revalidation of the CTC of the SCL Project and notified Government of the Corporation's latest estimate of CTC, being \$82,999.3 million, including additional Project Management Cost ("PMC") of \$1,371 million but excluding all costs related to the Hung Hom Extension Construction Incident.

72. This represents an increase of \$12,172.3 million from the original estimate of \$70,827 million, which is less than the previously estimated increase of \$16,501 million which the Corporation announced in December 2017. The Corporation has been able to reduce its estimate of the CTC from the amount estimated in December 2017 through strong cost control

procedures and due to the fact that the SCL Project has continued to progress since December 2017, so some of the risks included in the previous estimate have significantly reduced or been managed out and some works contracts have been completed, allowing a greater degree of certainty in relation to costs.

73. The Corporation notes that Government considers there has been no material modification in respect of the SCL project and therefore disagrees to the inclusion of any PMC in the CTC. The Corporation also notes that there has been no provision for any additional PMC for the Corporation in Government's applications to the Legislative Council for additional funding for the SCL project. Notwithstanding this, the Corporation will continue to comply with its project management obligations under the Entrustment Agreement and will, in the interim, meet the costs thereof, to allow the SCL project to progress in accordance with the latest programme. At the same time, the Corporation will follow up with Government for a resolution of this matter according to the terms and conditions of the Entrustment Agreement.

74. As previously announced in July 2019, to facilitate the phased opening of the TML, the Corporation agreed to fund, on an interim and without prejudice basis, the costs associated with the verification and assurance exercises and implementation of the suitable measures at the Hung Hom Station Extension and adjacent structures, as well as the costs for the preparation and implementation of TML phased opening, estimated to be around \$2 billion. These costs are not included within the revised CTC and are not included in the recent funding application for the SCL project. Apportionment of the actual cost will be dealt with in accordance with relevant SCL contracts.

STAKEHOLDER COMMUNICATION AND ENGAGEMENT

75. Most of the SCL works sites are in urban areas and close to local communities. We attach great importance to maintaining 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. Dedicated MTR and Contractors'

Hotlines are also available for handling enquiries and complaints in relating to the project.

EMPLOYMENT OPPORTUNITIES

76. About 2,900 construction workers and technical / professional staff members are employed for the SCL project as at 31 March 2020, which in general could meet the labour requirement. This is lower than the number employed when the project was in its construction peak. Moreover, 764 trainees have been recruited and provided with trainings and internship programmes by the contractors of the SCL project and the Construction Industry Council through the Corporation's "SCL Contractors Cooperative Training Scheme". 520 of the trainees have completed the trade test and proceeded to continue their careers in the field.

CONCLUSION

77. Members are invited to note the above information.

MTR Corporation Limited
June 2020

Expenditure report as at 31 March 2020

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	43,932.3	45,757.1	1,935.8
E&M works	13,901.8	7,451.6	1,250.9
Total	57,834.1	53,208.7	3,186.7

* The estimated amount of unresolved claim: Amount claimed (\$4,380.2 million) – Interim award (\$1,193.5 million) = \$3,186.7 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	314	3,216.0	1,861.5	573	2,737.8	802.0
E&M works	41	209.0	81.3	137	1,642.4	391.5
Total	355	3,425.0	1,942.8	710	4,380.2	1,193.5

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

2. As at 31 March 2020, the Corporation has received 1,065 substantiated claims and the amount claimed in total was about \$7,805.2 million, representing 13.5% of the awarded contract sum for the contracts. The Corporation has been discussing the details of the claims with the contractors concerned, and would thoroughly assess the amount claimed. The Corporation would process each

claim in a prudent manner, and the contractors would have to provide sufficient justifications and information. As at 31 March 2020, 355 cases were resolved and about \$1,942.8 million was awarded, representing about 3.36% 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 awards amounting to about \$1,193.5 million were made for some cases.

Overall works progress of the SCL as at 31 March 2020

Overall works completed : 93%

(A) Cumulative progress of 28⁽¹⁾ 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	100%
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	100%
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	79%
1121	EAL Cross Harbour Tunnels	99%
1122	Admiralty South Overrun Tunnel	100%
1123	Exhibition Centre Station and Western Approach Tunnel	83%
1124	Admiralty SCL Related Works	81%

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	90%
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 28 awarded major civil contracts as mentioned in Paragraph 65 of this report include Contracts 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	100%
1141B	New Rolling Stock for SCL Phase 2	68%
1151	Rolling Stock Modification and New Train Cars for SCL Phase 1	100%
1152	Signalling System for SCL Phase 1 & Signalling System Modification for MOL and WRL	99%
1152B	Signalling System for SCL Phase 2	84%
1153	Tunnel ECS for SCL Phase 1	100%
1153B	Tunnel ECS for SCL Phase 2	55%
1154	Platform Screen Doors for SCL Phase 1 & APG Retrofit for MOL	100%
1154B	Platform Screen Doors for SCL Phase 2 & APG Retrofit for EAL	48%
1155	Power Supply System and Trackside Auxiliaries for SCL Phase 1	100%
1155B	Power Supply System and Trackside Auxiliaries for SCL Phase 2	89%
1159	Lifts for SCL Phase 1	100%
1162	TETRA System for SCL Phases 1 & 2	98%
1162B	Radio Distribution Network System for SCL Phases 1 & 2	87%
1163	AFC System and SAM System for SCL Phases 1 & 2	77%
1164	Building Services for Diamond Hill Station	100%
1164B	Building Services for SCL Hong Kong Island Section	41%
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	100%
1166B	Main Control System for SCL Phase 2	75%
1169	Communications System for SCL Phase 1	100%
1169B	Communications System for SCL Phase 2	49%

1172	Escalators for SCL Phase 1	100%
1172B	Lift and Escalators for SCL Phase 2	42%
1173	Building Services for Hung Hom Station and Hung Hom Stabling Sidings	98%
1175	Building Services for Kai Tak Station	100%
1176	Building Services for Sung Wong Toi Station and Ancillary Building	100%
1177	Building Services for To Kwa Wan Station and Ancillary Building	100%
1183	EAL Signalling System Modification	100%
1191	Floodgate System for SCL Phase 2	70%

Audit Results of Verification of New Tuen Ma Line Stations

Station	No. of RISC forms*	No. of available RISC forms
Hin Keng	631	602 (~95%)
Diamond Hill	560	520 (~93%)
Kai Tak	804	657 (~82%)
Sung Wong Toi	1,077	1,020 (~95%)
To Kwa Wan	751	661 (~88%)
Total	3,823	3,460 (~91%)

Remarks: *RISC forms for key structural elements and essential hold points

The Latest Updated Pre-set Trigger Levels

	Monitoring Point	Type	Settlement Readings (mm)	Pre-set trigger levels (mm)
1. Exhibition Centre Station and Western Approach Tunnels (Readings as at March 2020)				
1	1123-AC-USM(SW)-16-D	Storm Drain	-37.8	-60 (Previously -40)

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 excavation works-front has already moved far away.

宋皇臺 站工地考古文物保育方案

附件三 Annex 3

Conservation Options for Archaeological Features Discovered at Sung Wong Toi Station



行人隧道 C 的走線 Alignment of Adit C

附件四 Annex 4



Existing pedestrian crossing
原有行人過路處

**Final Report of Commission of Inquiry
into the Construction Works at and near
the Hung Hom Station Extension
under the Shatin to Central Link Project**

INTRODUCTION

The Commission of Inquiry into the Construction Works at and near the Hung Hom Station Extension under the Shatin to Central Link Project (“the Commission”) submitted its final report (“the Final Report”)¹ to the Chief Executive on 27 March 2020. This note informs Members of the key findings and recommendations of the Commission, the Government’s responses, and the key findings of the independent follow-up audit on the implementation of recommendations in the interim report.

THE WORK OF THE COMMISSION

2. The Chief Executive in Council appointed the Commission² under the Commissions of Inquiry Ordinance (Cap. 86) on 10 July 2018 to look into the facts and circumstances surrounding the steel reinforcement fixing works and any other works which raise concerns about public safety in respect of the diaphragm wall and platform slab construction works at the Hung Hom Station Extension under the MTR Corporation Limited (“MTRCL”)’s Contract 1112 of the Shatin to Central Link (“SCL”) Project Project, following media reports about alleged cutting of threads from the end of steel reinforcement bars (“rebars”) in May 2018. The original terms of reference (“ToR”) and membership of the Commission are at **Enclosure A**.

A

3. It has subsequently come to light that in respect of the North Approach Tunnels (“NAT”), South Approach Tunnels (“SAT”) and Hung Hom Stabling Sidings (“HHS”) (also under Contract 1112 of the SCL Project), some of the required works-related documentation has been found missing and some parts might have been constructed not according to the plans accepted by the Highways Department (“HyD”) or Building Authority. As a result, on 19 February 2019, the Chief Executive in Council approved the extension of the Commission’s ToR to investigate the works at these three locations. The extended ToR of the Commission are at **Enclosure B**.

B

¹ Hard copies of the Final Report were delivered to LegCo Secretariat on 12 May 2020 for Members’ reference.

² The Commission was named “The Commission of Inquiry into the Diaphragm Wall and Platform Slab Construction Works at the Hung Hom Station Extension under the Shatin to Central Link Project”, and was given the present name when its ToR were extended in February 2019.

4. The involved parties of the inquiry (a brief description of their roles at **Enclosure C**) include—

- (a) the Transport and Housing Bureau (“THB”), Development Bureau (“DEVB”), HyD and Buildings Department (“BD”) (collectively as “the Government”);
- (b) MTRCL;
- (c) Leighton Contractors (Asia) Limited (“Leighton”);
- (d) PYPUN-KD & Associates Limited;
- (e) Fang Sheung Construction Company (“Fang Sheung”);

under the original ToR only:

- (f) China Technology Corporation Limited (“China Technology”);
- (g) Intrafor Hong Kong Limited;
- (h) Atkins China Limited; and

under the extended ToR only:

- (i) Wing & Kwong Steel Engineering Co., Limited.

5. Under the original ToR, the Commission commenced hearing evidence on 22 October 2018 and sat for a total of 46 days, with the closing submissions made on 28 and 29 January 2019. During that time, it heard the evidence of 65 witnesses who testified as to matters of fact and seven witnesses who were accepted as independent experts³. As for the extended ToR, the Commission sat for a total of 32 days, with the final closing submissions made on 22 and 23 January 2020, to hear the evidence of 37 factual witnesses and nine expert witnesses⁴.

6. In the inquiry, the Commission reached its determinations generally on the balance of probabilities. Nevertheless, in respect of the primary issue of structural integrity – safety – the Commission adopted a higher standard of proof. All findings as

³ To assist the inquiry under the original ToR, the Commission, Government, MTRCL, Leighton and China Technology each appointed their own independent structural engineering experts. The Commission and MTRCL each appointed an independent project management expert.

⁴ To assist the inquiry under the extended ToR, the Commission, Government, MTRCL and Leighton each appointed their own independent structural engineering experts. The Commission, MTRCL and Leighton each appointed an independent project management expert. The Government and Leighton each appointed an independent statistical expert.

to structural safety were made on the basis that, having given anxious consideration to all relevant evidence, the Commission was satisfied so that it was sure of such findings.

THE INTERIM REPORT

7. On 25 February 2019, the Commission submitted to the Chief Executive its interim report covering its inquiry under the original ToR (“the Interim Report”). The redacted version of the report was published on 26 March 2019. In respect of the station box structure⁵, the Commission reached the determinations that (i) the Hung Hom Station Extension diaphragm wall and platform slab construction works were not executed in accordance with Contract 1112 in material respects; and (ii) notwithstanding (i), the relevant works were safe.

8. In the Interim Report, the Commission recommended ongoing instrumented monitoring of the station box structure during operation. On promoting assurance on quality of works, the Commission also put forward a list of recommendations to enhance MTRCL’s project management system and the Government’s monitoring mechanism, covering the following major areas—

- (a) restructuring the Government’s project sponsorship arrangements to provide both authority and responsibility for the railway projects, and enhancing project governance and high-level supervision;
- (b) rationalising and clarifying rules and requirements, especially in relation to supervision, record keeping, non-conformance reporting and as-built drawings;
- (c) reviewing and substantially changing MTRCL’s Project Integrated Management System (“PIMS”) procedures, making MTRCL’s Project Management Plans (“PMPs”) more comprehensive and relevant to individual projects, as well as improving the interface between PIMS manuals and PMPs;
- (d) inducing closer communications within MTRCL to avoid the risk of silo-working, and introducing site presence of the designer to assist in ensuring that the design intent is duly implemented in the work;
- (e) adopting latest technological applications and tools to support efficient and effective making of site records, as well as adopting Building Information Modelling (“BIM”) as a collaboration tool;

⁵ The station box structure comprises, essentially, the east and west diaphragm walls, the upper platform slab for the East West Corridor and the lower platform slab for the North South Corridor.

- (f) ensuring ongoing competence of project-related staff through review of competence requirements for the relevant personnel;
- (g) extending the role and reviewing the engagement arrangement of the Monitoring and Verification Consultant of HyD (“M&V Consultant”); and
- (h) fostering collaborative culture between the Government, MTRCL and contractors with the object of achieving more successful project outcomes.

THE FINAL REPORT

9. On 27 March 2020, the Commission submitted to the Chief Executive its Final Report, which covered its inquiry under both the original and extended ToR⁶. The report was then passed to the Department of Justice for consideration as to the manner of publication and other relevant matters. The Department of Justice advised that the report could be made public after redacting several parts therein to avoid any prejudice (actual or perceived) to relevant criminal investigations and any potential prosecutions of any criminal offences in the future (if so decided to be justified after the relevant investigations).

The Commission’s Key Findings

10. Based on the factual and expert evidence provided, the Commission’s key findings, covering (i) unauthorised changes to construction details of the station box structure and extent of coupler connection failures therein; (ii) missing Request for Inspection, Survey and Check (“RISC”) forms in the NAT, SAT and HHS areas, defective construction of the three stitch joints and the shunt neck joint in NAT, unauthorised design changes, failure to ensure quality testing of all rebars brought to site; (iii) adequacy of MTRCL’s and the Government’s project management systems; and (iv) safety and fitness for purpose of the station box, NAT, SAT and HHS structures are summarised in the ensuing paragraphs.

(i) The Station Box Structure

11. During the construction of the station box structure, there were two unauthorised changes to construction details — the first change related to the reinforcement at the top of the east diaphragm wall to accommodate a pipe for pouring concrete and other cast-in elements; and the second change referred to the trimming down

⁶ As remarked by the Commission, the Final Report is not to be read as an extension to the Interim Report. The Final Report stands on its own as the final, full report in respect of the Commission’s extended mandate. In so far as any of the matters contained in the Interim Report have been included in the Final Report, they are to be taken into account as part of the Commission’s final findings.

of the top of the east diaphragm wall and replacing coupler connections therein with continuous rebars lapped to reinforcement in adjacent structural elements. Seemingly due to miscommunication, MTRCL's design management team was not aware of the two changes at the time of implementation and hence the changes were not included in the relevant submissions made by MTRCL to BD.

12. On a consideration of the extensive evidence put before it, the Commission found that there were instances when the threaded ends of rebars were cut, on some occasions this was done when workers ran out of Type A rebars and wished to convert Type B rebars into Type A⁷. On another occasion, a cluster of five rebars with threaded ends cut were not installed into their couplers properly or at all. The Commission also noted that MTRCL's opening up of the platform slabs had found 48 defective rebar-coupler connections out of 183 exposed samples. On the whole, the Commission was satisfied that although cutting of threaded ends of rebars did take place, it was not extensive and did not constitute a threat to the integrity of the station box structure. The persons responsible for cutting of threads from rebars were employees of Fang Sheung. There was no evidence that the workers were authorised or encouraged by their employer, and the practice was not condoned by either Leighton or MTRCL.

(ii) NAT, SAT and HHS

13. The Commission found that a high percentage of RISC forms, being a contractual requirement under Contract 1112 and proof of quality of construction, had either not been made out in the first place or had been lost. The Commission considered that the RISC process, constituting the primary source of certification of work correctly done, should have been the subject of full and contemporaneous compliance. The Commission was satisfied that the reason such a high percentage of RISC forms were never completed was that a form of contempt for the process was allowed to develop due to poor management.

14. Secondly, the mismatch between taper-threaded couplers and parallel-threaded rebars on the two sides of the interface between Contracts 1111 and 1112 has led to the failure in coupler connections at the interface stitch joints and the shunt neck joint at NAT. This resulted from the breakdown in communication within MTRCL and Leighton in respect of procurement of materials. However, no formal condemnation of the steel reinforcement fixing works was issued during the formal hold point inspections, suggesting that such inspections were perfunctory. This issue represented a clear case of unacceptably poor workmanship and of poor supervision and inspection.

15. Thirdly, a large number of reinforcement connections at construction joints between slabs and walls were changed by Leighton from the specified lapped bar connections to mechanical coupler connections, so as to provide temporary site access

⁷ Type A rebars had approximately 10/11 threads while Type B rebars had approximately 20/21 threads.

during construction. This change was not notified by MTRCL and/or Leighton to the Government and permission for the change was not given. Further, MTRCL and Leighton did not implement what the Government considered to be the appropriate supervision and inspection regime required for the coupler installations, and there were no proper quality or as-built records for the coupler connections. Therefore, the Commission concluded that in respect of this change, both MTRCL and Leighton failed to comply with the requirements of Contract 1112.

16. Fourthly, approximately 7% of the rebars delivered to site was not sampled and tested by a laboratory accredited under the Hong Kong Laboratory Accreditation Scheme (in addition to the certification provided by the steel manufacturers) pursuant to the Government's requirement. The root cause appeared to have been an admitted failure of communication between MTRCL and Leighton.

(iii) Adequacy of MTRCL's and the Government's Project Management Systems

17. The Commission recognised that there were unacceptable incidents of poor workmanship on site compounded by lax supervision in the construction of the station box, NAT, SAT and HHS structures. In a number of respects, especially in relation to failure to comply with the RISC form process, management of the construction endeavour fell below the standards of reasonable competence. Overall, the Commission found that both MTRCL and Leighton were responsible for serious deficiencies in their management and supervision systems. There were extensive evidence of failures in these systems including perfunctory inspections, deficient operation of the RISC system and improper record-keeping. The Commission also heard evidence of wide-scale retrospective compilation of construction records, these records all too often being inaccurate.

18. The Commission was also of the view that the Government, as overseer of the SCL Project, had to bear a measure of responsibility. HyD had not been able to detect failings in a timely manner nor had it taken firm action in a number of cases to ensure that corrective actions were taken by MTRCL. The Government should critically address the way in which it executes its multiple roles in relation to railway enhancement projects, and take a leading role to bring about a more collaborative culture with the objective of achieving more successful project outcomes.

(iv) Safety and Fitness for Purpose of the Structures

19. The independent engineering expert engaged by the Government considered that unless the "suitable measures" described in the Final Report on Holistic Assessment Strategy for the Hung Hom Station Extension and the Final Verification Study Report on As-constructed Conditions of the NAT, SAT and HHS⁸ were put into effect, the station

⁸ Since MTRCL has failed to submit comprehensive as-constructed records, the Government requested MTRCL to formulate holistic strategies to verify the condition of the structures. Upon completion of

box, NAT, SAT and HHS structures would fail to comply with the requirements of the Buildings Ordinance (“BO”, Cap. 123), the applicable codes and the established good practice of engineering design. The independent engineering experts of the Commission, MTRCL and Leighton, on the other hand, were of the view that the structures as they stood (i.e. without the need for “suitable measures”), were safe and fit for purpose.

20. The Commission noted that despite their conflicting views as to the need for the “suitable measures”, all the independent engineering experts agreed that the measures would add to the robustness of the structures or at least would not result in the structures being in any way less safe. The Commission was thus fully satisfied with the consensus that with the “suitable measures” in place, the station box, NAT, SAT and HHS structures will be safe and also fit for purpose.

The Commission’s Recommendations

21. The Commission previously recommended in the Interim Report ongoing instrumented monitoring of the station box structure during operation by means such as fibre optics or the like. In light of further evidence received from the independent engineering experts, the Commission was persuaded that the highly sensitive nature of such instrumentation may set off false alarms. The Commission therefore recommended the ongoing monitoring of the station structure to take the form of an enhanced “Planned Preventive Inspection” regime, perhaps for a period of up to five years. The Commission also noted the expert advice that any movement of the structure would be extremely low.

22. In addition, the Commission has put forward recommendations to promote assurance on quality of works, which were summarised in Chapter 14 and Annexure H of the Final Report. The majority of the recommendations have been featured in the Interim Report, with further recommendations covering the following major areas —

- (a) reviewing liaison and communications between the Government and MTRCL, and for BD to act more as a proactive project participant offering advice and expertise;
- (b) reviewing requirements for as-built records and consultation procedures;

the exercises, the Government scrutinised and accepted on 18 July 2019 MTRCL’s two final reports on (i) the holistic assessment strategy for the station box structure and (ii) the verification study for NAT, SAT and HHS. According to the final reports, MTRCL proposed “suitable measures” to address poor workmanship issues and to attain the requirements of the Code of Practice for Structural Use of Concrete under the BO as well as established good practice of engineering design. The “suitable measures” recommended by MTRCL in the reports involved such structural modification and other remedial works as retrofitting additional steel reinforcement bars, thickening of structural slabs or walls, strengthening of structural elements by additional struts, columns or steel plates, etc.

- (c) reviewing MTRCL’s resource monitoring processes and investigation procedures;
- (d) clarifying roles and requirements in relation to RISC form procedures with support of technology solutions;
- (e) reviewing interface management requirements and ensuring clear communication of information to the responsible individuals;
- (f) ensuring testing of steel in compliance of relevant requirements; and
- (g) including in the M&V Consultant’s role the monitoring of operation of project quality assurance systems, and ensuring sufficient resources for and prompt notification to the M&V Consultant.

23. The Commission also recommended that a follow-up audit independent from the Government and MTRCL be conducted 12 months following the date of the Final Report to provide assurance to the Chief Executive that the recommended measures have been properly implemented and/or satisfactory progress towards their implementation is being made.

THE GOVERNMENT’S RESPONSES

24. The Government appreciates the dedicated efforts by the Commission in ascertaining the circumstances surrounding the construction works at and near the Hung Hom Station Extension, as well as reviewing MTRCL’s project management system and the Government’s monitoring mechanism.

On Safety and Fitness for Purpose of the Structures

25. The Government welcomes the Commission’s conclusion that, the station box, NAT, SAT and HHS structures will be safe and also fit for purpose with the “suitable measures” in place. The “suitable measures” were accepted by the Government upon scrutiny by the Expert Adviser Team for the SCL Project (“the EA Team”) of THB⁹, HyD and BD to ensure that the built structures would meet the requirements under the BO, the

⁹ The EA Team was established on 15 August 2018, comprising three senior retired government officers. The EA Team would conduct an overall review of MTRCL’s project management system, and recommend additional management and monitoring measures to be undertaken by MTRCL and government departments as appropriate, in taking forward the SCL Project. In particular, the Team would advise on the most pragmatic methodology for MTRCL to ascertain the structural safety and the as-built condition of the platform slabs and diaphragm walls of Hung Hom Station Extension, consider any further investigations necessary in relation to the construction of key structures in all stations of the SCL Project, and advise on any other matters relevant to the works of the SCL Project.

applicable codes and the Entrustment Agreement for the main works of SCL signed between the Government and MTRCL on 29 May 2012¹⁰. The Government could only consider a structure to be fully “safe” (and hence “fit for purpose”) if both its design and construction comply with the above-mentioned requirements, not only in respect of loads or strength, but also serviceability, durability, fire resistance and robustness so as to cater for unforeseen and exceptional circumstances or adversities like fire. The BO and code requirements represented the minimum standards of safety and fitness for purpose required in Hong Kong, which was formulated upon extensive engagement with the industry and relevant stakeholders and reflected the community’s expectations and the consensus among industry practitioners taking into account circumstances particular to Hong Kong.

26. In determining the required “suitable measures”, the Government accepted the proposal from MTRCL of the judicious use of revised loading assumptions and parameters in the structural assessment in view that some of the uncertainties at the early design stage either had become more certain or no longer needed to be accommodated. Furthermore, it is acceptable to also adopt some other changes to the original design assumptions for this structure provided that suitable restrictions and precautionary arrangements are put in place for the future use of the station. Consequentially, the extent of the structural strengthening works has been substantially reduced, so have been the construction time and complexity of the works. The safety and functionality of the station structure has not been compromised.

27. To pave way for timely commissioning of the SCL, MTRCL, in consultation with the Government, has been implementing the “suitable measures” in parallel with the inquiry. As at end April 2020, the “suitable measures” at HHS have been substantially completed and those for the station box structure and SAT are expected to be completed by June 2020. The remedial works of the shunt neck joint are targeted for completion by May 2020. There is no “suitable measures” required for the NAT.

28. The Government notes the Commission’s revised recommendation on long-term monitoring of the station structure. Given that the station structure will be safe and also fit for purpose with the “suitable measures” in place (paragraph 20 above refers), the Government will go with the recommendation in the Final Report that ongoing monitoring of the structure may take the form of an enhanced “Planned Preventive Inspection”. The Government will seek advice from the EA Team and discuss with MTRCL on the detailed arrangement in this regard.

¹⁰ The Entrustment Agreement provides that the SCL Project shall be designed and constructed to “standards and in accordance with a specification which is consistent with and not materially in excess of those applicable to relevant elements of comparable completed railway projects in Hong Kong”. The relevant design standard used by MTRCL in railway projects in Hong Kong is its New Works Design Standard Manual.

On Adequacy of MTRCL's and the Government's Project Management Systems

29. The Government also respects the Commission's views on the adequacy of MTRCL's project management system and the Government's monitoring mechanism, and attaches great importance to the Commission's recommendations on suitable measures to assure the quality of works. All of the recommendations in the Commission's Interim Report are either implemented or in the process of being implemented.

30. For future railway projects, the Government is examining the feasibility of establishing a new department specifically tasked to supervise and monitor the planning and delivery of new railway projects. The roles, responsibilities, staffing and structure of the new department are being studied in depth. Furthermore, HyD has commissioned a consultancy to study different delivery approaches and practices in major rail infrastructure projects overseas and examine enhancements to the Government's monitoring and control strategies. In examining in due course the applicability of overseas experience to Hong Kong, we will take into account the integrated Operating Agreement between the Government and MTRCL, and also the Mass Transit Railway Ordinance (Cap. 556).

31. As for the new recommendations in the Final Report, some have been implemented through the Government's enhancement measures since the discovery of the issues at Hung Hom Station Extension and follow-up actions in response to the recommendations in the Interim Report. Some of the Government's main follow-up actions are highlighted below —

- (a) for the SCL Project, the Government has already carried out a series of follow-up actions with a view to providing closer monitoring of MTRCL's project management processes. With a view to promoting collaborative working relationships and culture in project delivery, HyD and MTRCL established a high-level Steering Group on Communications for the SCL Project in May 2019, aiming to provide directions on enhancing the communication between the Government and MTRCL. Moreover, co-location working arrangement for the SCL Project has been introduced since July 2019 with HyD now deploying in-house inspectorate staff members to station full-time on sites for closer and independent monitoring of MTRCL's site supervision work and conducting on-site surprise checks. Since December 2019, BD also participated in the co-location working arrangement to facilitate direct communication with MTRCL and its design consultants and contractors. Furthermore, additional weekly review meetings involving BD, HyD, the M&V Consultant, MTRCL and its design consultants/contractors have been put in place since March 2020 specifically for processing minor changes of design and construction details within seven days in accordance with a set of collaborative fast track consultation procedures. With the above, BD has been acting more as a proactive project

participant offering its advice and expertise to the project team at both design and construction stages;

- (b) BD has drafted a new practice note consolidating requirements relating to specific tasks and testing of materials (e.g. quality supervision plan for installation of ductility coupler splicing assemblies), as well as proposed amendments to the Code of Practice for Site Supervision 2009 (“Supervision Code”), in order to provide further guidelines on the requirements and responsibilities. BD is consulting the industry on the draft new practice note and the proposed amendments to the Supervision Code via the established consultative mechanism with a view to promulgating these two documents in the third quarter of 2020; and
- (c) HyD has requested the M&V Consultant to be more proactively involved in its existing role under the SCL project. Since August 2018, the M&V Consultant has joined all of the monthly three-tier project supervision meetings¹¹ to enable its prompt follow-up of and instant feedback to issues raised by MTRCL at these meetings. Further, it has been conducting site walks and audits more frequently, amounting to a total of 191 site walks from August 2018 to April 2020. The average number of audits on MTRCL’s management of active civil engineering contracts has also been increased from 4-5 audits per year before enhancement to 7-8 audits at present. The M&V Consultant was also requested to perform other duties specifically covering quality issues, such as a “health-checking” audit for site supervision and construction control of other SCL stations, and a technical and procedural review of non-conformance reports issued by MTRCL, etc. As for future railway projects, the consultancy described in paragraph 30 will also review the duties of the M&V Consultant and the current monitoring and supervision mechanism for railway projects.

32. As for other recommendations in the Final Report, the Government is studying them in detail and explore the implementation arrangements in consultation with relevant stakeholders as appropriate.

INDEPENDENT FOLLOW-UP AUDIT ON IMPLEMENTATION OF RECOMMENDATIONS IN THE INTERIM REPORT

33. Following the recommendation in the Interim Report, the Government appointed the Independent Audit Panel for Recommendations in the Interim Report of the Commission of Inquiry into the Construction Works at and near the Hung Hom Station Extension under the Shatin to Central Link Project (“the Panel”) in October 2019 to

¹¹ The monthly three-tier project supervision meetings between the Government and MTRCL refer to the top-tier Project Supervision Committee meetings, middle-tier Project Coordination Meeting and base-tier Project Progress Meeting.

conduct the independent follow-up audit on the implementation progress of the recommended measures in the Interim Report. The ToR and membership of the Panel are at **Enclosure D**.

34. Having considered in detail the progress reports, other written submissions and oral presentations from the Government and MTRCL, the Panel submitted its Audit Report (“the Audit Report”) to the Chief Executive on 26 May 2020 to set out the findings of the Audit. The Audit Report has been uploaded to the THB website on 3 June 2020 (<https://www.thb.gov.hk/eng/psp/publications/transport/studies/index.htm>). The key findings of the Audit Report are summarised in the ensuing paragraphs.

35. Among the 58 recommendations made by the Commission in its Interim Report to promote public safety and assurance on quality of works, 13 and 33 are to be followed up solely by the Government and MTRCL respectively, while 12 require actions jointly by both parties. These recommendations are broadly divided into the following six categories—

- (a) promoting public safety (1 recommendation) ;
- (b) enhancement of leadership, competence and governance (12 recommendations);
- (c) promoting collaborative culture (7 recommendations);
- (d) revised arrangements for contractual and commercial issues (5 recommendations);
- (e) rationalisation and clarification of rules and requirements (29 recommendations); and
- (f) review of monitoring and verification arrangements (4 recommendations).

36. The Panel is of the view that, of these 58 recommendations, 14 have been fully implemented, satisfactory progress towards full implementation of 42 recommendations is being made, whereas progress has been made towards the implementation of the remaining two recommendations.

37. In regard to the 25 recommendations requiring follow-up from the Government, 12 have been fully implemented. In taking forward the other 13 recommendations that are under progress, THB is studying internally the necessary measures and will make reference to the consultancy commissioned by HyD (paragraphs 30 and 31(c) above refers)¹². In addition, BD is drafting a new practice note and

¹² The consultancy is targeted to be completed by the first quarter of 2021.

amendments to the Supervision Code in response to the Commission's recommendations on rationalising and clarifying rules and requirements (paragraph 31(b) above refers).

38. As for the 45 recommendations requiring follow-up from MTRCL, ten have been fully implemented while 35 are being implemented. For the full implementation of the remaining recommendations, MTRCL is conducting a review on its existing contract forms (to be completed by the third quarter of 2020) and review and update of its Project Integrated Management System (to be completed by the fourth quarter of 2020).

FURTHER AUDIT

39. In response to the Commission's recommendation (paragraph 23 above refers), the Government will arrange for a further independent follow-up audit to cover the recommended measures in the Final Report. Apart from scrutiny regarding the recommendations in the Final Report, the further audit will also assess the implementation progress of the 44 recommendations in the Interim Report that have not been fully implemented.

Transport and Housing Bureau
Development Bureau
Highways Department
Buildings Department
3 June 2020

**Commission of Inquiry into the
Diaphragm Wall and Platform Slab Construction Works
at the Hung Hom Station Extension
under the Shatin to Central Link Project**

Original Terms of Reference

In respect of the diaphragm wall and platform slab construction works at the Hung Hom Station Extension under the MTR Corporation Limited (“MTRCL”)’s Contract No. 1112 (“Contract”) of the Shatin to Central Link Project,

- (a)
 - (i) to inquire into the facts and circumstances surrounding the steel reinforcement fixing works, including but not limited to those works at locations that have given rise to extensive public concern about their safety since May 2018;
 - (ii) to inquire into the facts and circumstances surrounding any other works which raise concerns about public safety; and
 - (iii) to ascertain whether the works in (i) and (ii) above were executed in accordance with the Contract. If not, the reasons therefor and whether steps for rectification have been taken;
- (b) to review, in the light of (a) above,
 - (i) the adequacy of the relevant aspects of the MTRCL's project management and supervision system, quality assurance and quality control system, risk management system, site supervision and control system and processes, system on reporting to Government, system and processes for communication internally and with various stakeholders, and any other related systems, processes and practices, and the implementation thereof; and
 - (ii) the extent and adequacy of the monitoring and control mechanisms of the Government, and the implementation thereof; and

- (c) in the light of (b) above, to make recommendations on suitable measures with a view to promoting public safety and assurance on quality of works.

**Commission of Inquiry into the Construction Works
at and near the Hung Hom Station Extension
under the Shatin to Central Link Project**

Membership

Chairman and Commissioner

Mr Michael John HARTMANN, GBS

Mr Michael John HARTMANN served in the Judiciary in Hong Kong for over 20 years, retiring as Justice of Appeal in 2012. After retirement, he remained a Non-Permanent Judge of the Court of Final Appeal until 2016. He is currently Chairman of the Market Misconduct Tribunal, the Securities and Futures Appeals Tribunal and the Higher Rights Assessment Board. Mr Hartmann specialises in public and administrative law.

Commissioner

**Professor Peter George HANSFORD,
FREng, FICE, FAPM, FRSA**

Professor Peter George HANSFORD, a Past President of the Institution of Civil Engineers and a Fellow of the Royal Academy of Engineering in the United Kingdom (UK), has over 40 years of experience in the delivery of major infrastructure projects. He was appointed as Chief Construction Adviser to the UK Government from 2012 to 2015, and is currently an Honorary Professor of University College London. In November 2018 he was awarded the Sir Monty Finniston Award for lifetime achievement by the Association for Project Management.

**Commission of Inquiry into the Construction Works
at and near the Hung Hom Station Extension
under the Shatin to Central Link Project**

**Expanded Terms of Reference
(as approved on 19 February 2019)**

Regarding the MTR Corporation Limited (“MTRCL”)’s Contract No. 1112 (“Contract”) of the Shatin to Central Link Project:

- (a) (1) in respect of the diaphragm wall and platform slab construction works at the Hung Hom Station Extension,
 - (i) to inquire into the facts and circumstances surrounding the steel reinforcement fixing works, including but not limited to those works at locations that have given rise to extensive public concern about their safety since May 2018;
 - (ii) to inquire into the facts and circumstances surrounding any other works which raise concerns about public safety; and
 - (iii) to ascertain whether the works in (1)(i) and (ii) above were executed in accordance with the Contract. If not, the reasons therefor and whether steps for rectification have been taken;

- (2) in respect of the construction works at the North Approach Tunnels, the South Approach Tunnels and the Hung Hom Stabling Sidings,
 - (i) to inquire into the facts and circumstances surrounding any problem relating to the steel reinforcement fixing or concreting works, including but not limited to any lack of proper inspection, supervision or documentation of such works undertaken, any lack of proper testing of the materials used for such works and of proper documentation of such testing, and any deviation of such works undertaken from the designs, plans or drawings accepted by the Highways Department or the Building Authority;

- (ii) to inquire into the facts and circumstances surrounding any works or matters which raise concerns about public safety or substantial works quality; and
 - (iii) to ascertain whether the works and matters involved in (2)(i) and (ii) above were executed in accordance with the Contract. If not, the reasons therefor and whether steps for rectification have been taken;
- (b) to review, in the light of (a) above,
 - (i) the adequacy of the relevant aspects of the MTRCL's project management and supervision system, quality assurance and quality control system, risk management system, site supervision and control system and processes, system on reporting to Government, system and processes for communication internally and with various stakeholders, and any other related systems, processes and practices, and the implementation thereof; and
 - (ii) the extent and adequacy of the monitoring and control mechanisms of the Government, and the implementation thereof; and
- (c) in the light of (b) above, to make recommendations on suitable measures with a view to promoting public safety and assurance on quality of works.

**Commission of Inquiry into the Construction Works
at and near the Hung Hom Station Extension
under the Shatin to Central Link Project**

**Brief Description of the Roles of Involved Parties
in the SCL Project**

The involved parties of the Commission of Inquiry into the Construction Works at and near the Hung Hom Station Extension under the Shatin to Central Link (“SCL”) Project include —

- (a) the Transport and Housing Bureau (“THB”), Development Bureau (“DEVB”), Highways Department (“HyD”) and Buildings Department (“BD”) (collectively as “the Government”) — THB and HyD act as the owner of the SCL Project and perform a general monitoring role, while DEVB and BD carry out their functions and duties in relation to regulation actions against contractors on DEVB’s “List of Approved Contractors for Public Works” and building safety control respectively;
- (b) MTR Corporation Limited (“MTRCL”) — entrusted as the project manager through three entrustment agreements entered into between the Secretary for Transport and Housing (representing the HKSAR Government) and MTRCL for (i) design and site investigation; (ii) advance works; and (iii) construction and commissioning of the SCL Project respectively;
- (c) Leighton Contractors (Asia) Limited (“Leighton”) — engaged by MTRCL as the main contractor of the construction works under Contract No. 1112 of the SCL Project;
- (d) PYPUN-KD & Associates Limited — engaged by HyD as the Government’s monitoring and verification consultant to monitor the performance of MTRCL under the entrustment agreement for the construction and commissioning of the SCL Project;

- (e) Fang Sheung Construction Company — engaged by Leighton as the sub-contractor responsible for the reinforcement bar cutting, bending and fixing works for the platform slabs and the South Approach Tunnels;

under the Original Terms only:

- (f) China Technology Corporation Limited — engaged by Leighton as the sub-contractor responsible for erecting formwork and pouring concrete for the platform slabs and the South Approach Tunnels;
- (g) Intrafor Hong Kong Limited — engaged by Leighton as the sub-contractor responsible for the construction of diaphragm walls, barrettes and associated works;
- (h) Atkins China Limited — engaged by MTRCL as its detailed design consultant, and by Leighton as its technical advisor; and

under the Extended Terms only:

- (i) Wing & Kwong Steel Engineering Co., Limited. — engaged by Leighton as the sub-contractor responsible for the reinforcement bar cutting, bending and fixing works for the North Approach Tunnels and the Hung Hom Stabling Sidings.

**Independent Audit Panel for
Recommendations in the Interim Report
of the Commission of Inquiry into the Construction Works
at and near the Hung Hom Station Extension
under the Shatin to Central Link Project**

Terms of Reference

In respect of the recommended measures in the Interim Report of the Commission of Inquiry into the Construction Works at and near the Hung Hom Station Extension under the Shatin to Central Link Project:

- (i) to consider progress reports from the Government and the MTR Corporation Limited on the implementation of the recommended measures;
- (ii) to review whether the recommended measures have been fully implemented and, if not, whether satisfactory progress towards full implementation is being made; and
- (iii) to prepare a report to the Chief Executive on (i) and (ii) above, together with any relevant observations or recommendations.

Membership

Chairman

Mr Wong Kwai Huen, BBS, JP

Members

Ir Prof Lo Hong Kam, JP

Ir Chan Chi Chiu, SBS