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 2016)

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 2016.

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. SCL will have ten stations. Apart from bringing improvements to the existing Tai Wai Station, the SCL project will involve construction of new stations or extension of existing stations at Hin Keng, Diamond Hill, Kai Tak, To Kwa Wan, Ma Tau Wai, 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 Approved Project Estimate for the entire SCL project is \$79,800 million (in money-of-the-day prices) and the project is funded by the Government under the "concession approach". On 18 February 2011, the Finance Committee of the Legislative Council approved the funding applications for "63TR Shatin to Central Link advance works remaining works" and "64TR Shatin to

Central Link – construction of non-railway works – advance works". Thereafter, the Government and the MTR Corporation Limited ("MTRCL") entered into an agreement for entrusting to the latter the advance works of SCL at the expanded Admiralty Station and Homantin Station while implementing SIL(E) and KTE respectively. The advance works commenced in May 2011.

- 5. Subsequently, on 11 May 2012, the Finance Committee of the Legislative Council approved the funding applications 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". Thereafter, the Government and MTRCL entered into an agreement for entrusting construction, testing and commissioning of the main works of SCL to the latter. 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. Upon expansion, Admiralty Station will become an integrated station serving passengers of SCL and SIL(E). Hence, except for the construction cost (about \$300 million in money-of-the-day prices) of the overrun tunnel of SCL which would be fully absorbed by the SCL project, the construction cost of the expansion works of Admiralty Station will be apportioned between SCL and SIL(E) projects at a ratio of 70:30 in accordance with the estimated patronage at peak hours at the station. According to the cost estimate in 2011, SCL project has to share about \$2,700 million (in money-of-the-day prices) for the costs of building works, building services works, electrical and mechanical (E&M) works for the portion of SCL at Admiralty Station. Besides, the SCL project has to share about \$350 million (in money-of-the-day prices) for the construction costs of the portion of ventilation facilitates at Admiralty Station for SCL. Hence, the SCL will have to share an overall cost of about \$3,350 million (in money-of-the-day prices) for the advance works at Admiralty Station. advised the Highways Department ("HyD") on 12 August 2015 that the completed cost estimate review of the expansion works of Admiralty Station of SIL(E) indicated an upward adjustment of the relevant cost of expansion works of Admiralty Station to be shared by SCL. According to the apportionment ratio of 70:30 above, the cost shared by the advance works of SCL has to be adjusted upward from about \$3,350 million to about \$4,650 million with an increase of about \$1,300 million. HyD has provided comments and raised questions on the

further information provided by MTRCL and will critically examine the latest cost estimate with the assistance of its monitoring and verification consultant upon receipt of detailed information from MTRCL.

7. Ho Man Tin Station is also an integrated station serving passengers of both SCL and KTE. The construction cost of Ho Man Tin Station is also apportioned between SCL and KTE projects at a ratio of about 74:26 in accordance with the estimated patronage at peak hours at the station. According to the cost estimate in 2011, the SCL project has to share about \$2,900 million (in money-of-the-day prices) for the costs of building works, building services works, E&M works for the advance works of SCL at Ho Man Tin Station. According to the information provided by MTRCL to HyD on 12 August 2015, the relevant construction cost of Ho Man Tin Station shared by SCL would remain within the budget.

Latest Progress of the Works

8. The progress report of the SCL project as at 31 March 2016 submitted by MTRCL is at **Annex 2**. The analysis and supplement made by HyD on the progress report are provided below.

Tai Wai to Hung Hom Section

Shatin Section (Section of Railway between Tai Wai Station and Ma Chai Hang,

Wong Tai Sin, including Hin Keng Station and Modification of Station Platforms

of Ma On Shan Line)

9. The progress of Hin Keng Station, the associated connecting elevated and at-grade track works and the modification of station platforms of Ma On Shan Line are generally in line with the planned programme. The Automatic Platform Gates ("APG") of Ma On Shan Line at Tai Wai Station towards Wu Kai Sha have been in operation since the end of July 2015. Apart from Tai Wai Station, installation works for the APG at other stations of Ma On Shan Line have also commenced progressively. The main structural works of Hin Keng Station and the viaduct and at grade tunnel connecting the station were completed. Building services works, E&M works and track laying works for the station and the connecting tunnel are currently in progress.

10. Water-proofing system installation works and tunnel lining construction continue inside the Hin Keng to Ma Chai Hang tunnel and the current progress is generally in line with the planned programme.

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

- 11. The two sections of tunnels from Kai Tak Station to Diamond Hill Station and from Diamond Hill Station to Ma Chai Hang are constructed with tunnel boring machine ("TBM"). The excavation of the tunnel from Kai Tak Station to Diamond Hill Station was completed in October 2015. The excavation of the tunnel from Diamond Hill Station to Ma Chai Hang was also completed in April 2016.
- The construction of Diamond Hill Station structure had fully commenced. The construction of the station main structure was substantially completed in June 2016. Building services works, E&M works and track laying works for the station are currently in progress. Besides, the up-track tunnel and the shaft for the emergency access point at the junction of Wong Tai Sin Road and Sha Tin Pass Road have been connected. The construction of the Public Transport Terminus adjacent to the emergency access point continues, and it is anticipated that the main structure would be completed in the third quarter of 2016. The drill and blast works for the ventilation tunnel starting from the works site at Ma Chai Hang Recreation Ground were completed in January 2016.
- 13. The improvement works of the pedestrian connecting facilities between Tsz Wan Shan area and Diamond Hill Station of SCL (the layout plan of the pedestrian connecting facilities at Annex 3) were originally scheduled for completion in stages between 2014 and 2016. Due to unpredicted and complicated geological conditions, and the existence of congested underground utilities which have made the construction more difficult, there has been delay to some of the works. MTRCL and the contractor continued to implement possible measures so as to catch up with the progress as far as possible. Amongst the 15 items of facilities, 6 items have been opened for public use, including 2 covered walkways, 5 lift towers and a footbridge. MTRCL has reviewed the time table for the remaining 9 items, of which7 items are expected to be opened to public within 2016, including the lift tower at Ching Hong House of Tsz Ching Estate, the footbridge at Yuk Wah Street, the lift tower next to Tsz Lok Estate Ancillary Facilities Block, the two covered walkways at Po Kong Village Road, the

additional lift towers at Po Kong Village Road and Fung Tak Road footbridge, as well as the lift tower at Lung Poon Street. Regarding the two footbridges along Wan Wah Street and Yuk Wah Street, it is anticipated that their completion would have to be deferred to the third quarter of 2017.

<u>Kowloon City Section (Section of Railway between Kai Tak Station to Ho Man Tin Station, including To Kwa Wan Station and Ma Tau Wai Station)</u>

Kai Tak Station

14. Kai Tak Station is located inside the Kai Tak Development Area. The main structure of the station was substantially completed in July 2015. The structural works of two adits of the station entrance are anticipated to be completed by June 2016. The fitting-out works, E&M works and track laying works are in progress. The tunnel structures between Kai Tak Station and To Kwa Wan Station were completed in April 2016.

To Kwa Wan Station

- 15. Under the close supervision of the Antiquities and Monuments Office ("AMO"), the independent archaeologist team completed the archaeological excavation at the end of September 2014. The Antiquities Authority (i.e. the Secretary for Development), after considering the views of the Antiquities Advisory Board, the Legislative Council and the Kowloon City District Council, decided on the conservation options on 8 December 2014 with most of the archaeological discoveries preserved in-situ. The archaeological remnants to be preserved in-situ have to be protected by backfilling of protective materials. Under the close supervision of AMO, the protective works for the remnants to be preserved in-situ were completed in May 2015. Regarding Well J2 and the water channel, they were removed piece by piece by hand in March 2015 after detailed recording and under the close supervision of AMO. The components are stored properly for future reinstatement.
- 16. Moreover, as we stated in the papers submitted to the LegCo Subcommittee on Matters Relating to Railways ("RSC") and Panel on Development in November 2014, due to the preservation in-situ of the remnants at and in the vicinity of Adit C connecting the station and Pak Tai Street (i.e. items 6 to 10 of the archaeological features at Annex 4), the entire alignment of the adit would be seriously affected. It would be necessary to find a suitable alternative

alignment for the construction of the adit. Since the area around the adit has been designated as a temporary works site for the construction of the station and the train tunnel. It is anticipated that the area can be made available for further investigation by the relevant department when the respective works are completed in the second half of 2017. In other words, Adit C connecting the station and Pak Tai Street would not be completed at the same time as To Kwa Wan Station. A temporary access at grade would be required to connect the station entrance. In case no suitable alternative alignment could be identified eventually as a result of further archaeological discoveries or other site constraints, residents in the vicinity of Pak Tai Street might need to use the existing pedestrian crossing facilities at Ma Tau Chung Road to gain access to To Kwa Wan Station. MTRCL is exploring the feasibility of adding an at-grade crossing at a suitable location of Song Wong Toi Road (see **Annex 5**) for reducing the walking distance between Pak Tai Street and the station entrance.

17. The construction works of To Kwa Wan Station fully resumed in March 2015. The excavation of the station was substantially completed in December MTRCL is carrying out the structural works of the station in full swing. 2015. The TBM works for the down-track tunnel from To Kwa Wan Station to Ho Man Tin Station were completed in April 2016. On the other hand, the TBM works for the up-track tunnel from To Kwa Wan Station to Ho Man Tin Station commenced in September 2015 and the TBM has reached Ma Tau Wai Station with about 50% of the tunnel completed as at 31 March 2016. It is anticipated that the TBM will reach Ho Man Tin Station in the third quarter of 2016. 31 March 2016, MTRCL estimated that the archaeological works would result in a delay of at least 11 months and a minimum additional cost of about \$4.1 billion to the "Tai Wai to Hung Hom Section" of SCL. However, the ultimate implication is subject to the final assessment of MTRCL and the verification of HyD.

Ma Tau Wai Station

18. Ma Tau Wai Station is an underground station beneath Ma Tau Wai Road. The station is being constructed by a top-down method. To cater for the construction of the station, the traffic diversion scheme implemented at a section of Ma Tau Wai Road between Chi Kiang Street and Sheung Heung Road continues. Two southbound traffic lanes and a single northbound lane would be maintained. MTRCL is carrying out the excavation and structural works of the station in full swing. Construction of the station concourse and upper platform was completed in November 2015 and March 2016 respectively. It is anticipated

that the excavation and construction of the station lower platform would be completed by the first quarter of 2017.

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)

19. As the tunnelling works of SCL to the north of Hung Hom Station have to be carried out on a very busy road and along the operating East Rail Line, it is necessary to exercise due care to prevent the construction from affecting the busy road sections nearby. Temporary traffic diversions along Chatham Road North for the tunnelling works were fully implemented at the end of 2014. traffic has been generally smooth. For the construction work of the section between Ho Man Tin Station and Hung Hom Station, construction of tunnel structural work has been substantially completed. For the section near Oi Sen Path south of Princess Margaret Road, installation of noise enclosure and excavation works are underway. The construction works at Hung Hom Station have to be carried out underneath the existing station podium. The limited space available has rendered the construction highly difficult and the works must be carried out in a prudent manner. The impact of the limited working space has led MTRCL and the contractor continue to adjust the to a delay of about 4 months. work sequences and has also deployed additional machinery and manpower in order to recover some of the delay of the works at Hung Hom Station.

Hung Hom to Admiralty Section Cross Harbour Section (Section of the tunnel across Victoria Harbour)

20. The main construction works of the Cross Harbour Section have commenced. Such works include ground investigation of the seabed, installation of instrumentation monitoring system, erection of temporary marine platforms and dredging works. The contractor continues the temporary marine cofferdam at Hung Hom landfall to prepare for the future excavation and tunnel construction works. Also, the construction of the immersed tube tunnel units has commenced. The progress is as planned.

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

- 21. The advance works for the Hong Kong Island Section continue. The foundation works for the re-provisioning of Harbour Road Sports Centre were completed and construction of substructure is in progress. Meanwhile, the modification works for the foundation of flyovers are progressing smoothly.
- 22. The advance works for the excavation of railway tunnels, including ground stabilization, ground investigation, diversion of underground utilities, as well as investigation and removal of underground obstructions etc. are underway along the tunnel alignment and at the portal area of the Cross-Harbour Tunnel, Wan Shing Street, Marsh Road and the ex-Wan Chai West Preliminary Treatment Works. The progress is satisfactory. The excavation works for the launching shaft for the assembling of TBM located at the Causeway Bay Typhoon Shelter ("CBTS") temporary reclaimed area work site were completed. The TBM started excavation works in March 2016 for the construction of the tunnel from CBTS to Exhibition Station. Construction of diaphragm walls for the launching shaft of the other TBM at Fenwick Pier Street work was completed and construction of ground beams is underway.
- 23. Demolition of the existing Police Officers' Club ("POC") to facilitate the construction of ventilation facilities for the tunnel of SCL was completed. Upon completion of the tunnel, the POC, which will integrate with the railway tunnel ventilation system, will be re-provisioned at its original location.
- 24. Construction of Exhibition Station at the ex-Wan Chai Ferry Pier Public Transport Interchange continues. The works include construction of diaphragm walls and pipe piling works. To allow flexibility for the construction of convention facilities above Exhibition Station, a certain part of the enabling works for the topside development would be incorporated into the underground structure of Exhibition Station. Based on the currently available information on the geological condition, it is initially estimated that this would result in a delay of at least 5 months for the construction of Exhibition Station and an increase in construction cost.
- 25. Regarding the large metal object found on the seabed within the reclamation area under Wan Chai Development Phase II ("WDII"), the Civil Engineering Development Department ("CEDD") removed it from the

reclamation site in June 2015 to allow resumption of the reclamation and relevant works. The reclamation works were completed and associated works are underway. Originally, the reclaimed land would be handed over to the contractor of SCL at the end of December 2016. As the discovery of the metal object has affected the progress of reclamation works there, CEDD indicated that the handover date of part of the works area would be deferred by 7 months. HyD and MTRCL will continue to liaise with CEDD on the handover arrangement of works areas.

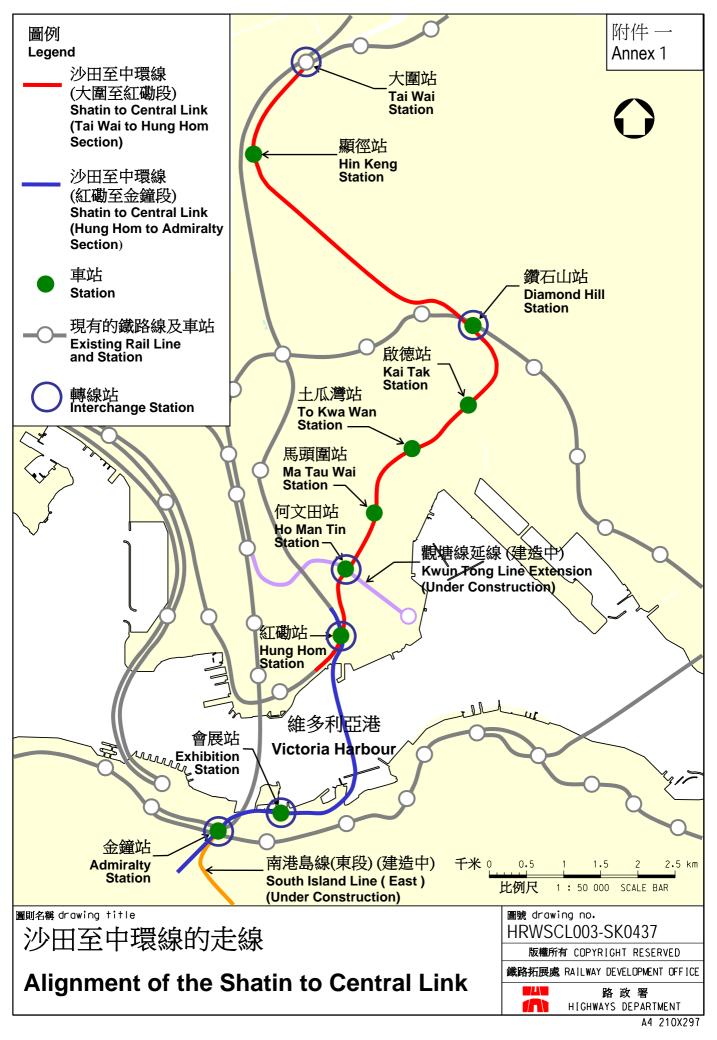
- 26. In addition, as mentioned in previous progress reports, CEDD estimated that the handover date of the associated critical work sites adjoining the junction of Expo Drive East and Convention Avenue would be deferred by about 6 months. Since then, CEDD has continued to implement measures to catch up with part of the works progress and most of the work sites could be handed over to MTRCL in accordance with the original schedule. It is estimated that the original delay of 6 months for the handover dates of other critical work sites would also be shortened. For those remaining work sites which could not be handed over as scheduled, HyD and MTRCL will continue to discuss further with CEDD on measures to minimise the risk of delay to SCL as far as possible.
- 27. Since parts of Exhibition Station are located underneath roads in Wan Chai North where the traffic is busy, the main construction works for the station have become highly complicated and there are risks to the progress of construction. It is anticipated that the overall 6-month delay in the completion of Exhibition Station and the "Hung Hom to Admiralty Section" of SCL will remain. As a result, the commissioning date of the "Hung Hom to Admiralty Section" would be deferred to 2021. Besides, apart from the additional construction cost arising from the enabling works at Exhibition Station, the construction delay as a result of the deferred handover of work sites may also lead to additional construction cost.
- 28. Moreover, to meet the Police's request on security grounds, the SCL works sites between Lung Wo Road and the ex-bus terminus in Wan Chai North were temporarily closed for four days between 16 and 19 May 2016. At the request of HyD, MTRCL and its contractors had taken appropriate measures, with a view to minimising the possible impact on the projects arising from the temporary closure of such construction sites, and handled any related matters according to the provisions of the contracts. The financial implication would also be assessed in accordance with the terms of the contracts.

Conclusion

- 29. In view of the above assessments mentioned in paragraphs 9 to 28 and 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 To Kwa Wan Station earlier on, HyD will co-ordinate and oversee the construction of SCL so that MTRCL could try its best to recover some of the delay to the "Tai Wai to Hung Hom Section" with a view to commissioning the "Tai Wai to Hung Hom Section" in 2019 as far as possible. Due to the impact of site handover arrangement of WDII and to allow flexibility for the construction of new convention facilities above Exhibition Station, the commissioning date of the "Hung Hom to Admiralty Section" will be deferred to 2021.
- 30. MTRCL is conducting a cost review of the entire SCL in phases, including the additional construction costs for the advance works of SCL at Admiralty Station and Ho Man Tin Station, and the additional costs for the main works of SCL arising from the archaeological and conservation works, the enabling works to cater for the topside development, as well as the deferred site handover. MTRCL advised that as the current contingency of the advance works of SCL will not be sufficient to meet the additional costs of the related advance works (preliminary estimate of MTRCL of about \$1,300 million (see paragraph 6 above)). Hence, upon scrutiny of the additional costs, we will seek additional funding from the Legislative Council at the outset of next legislative session in order to meet the payments for the additional costs.
- 31. Besides, due to the complexity of the SCL project, coupled with the fact that the "Hung Hom to Admiralty Section" was just about 30% complete and the remaining 70% of works would still be subject to the impacts of various factors, MTRCL recently also advised that it could only conduct a more realistic cost review of the main works of SCL in the second half of 2017 in order to come up with a better estimate of the construction cost of the main works. As the current contingency of the main works of SCL will not be sufficient to meet the additional costs of the main works, upon scrutiny of the additional costs, we will seek additional funding from the Legislative Council in due course in order to proceed with the main works.
- 32. SCL is a major underground infrastructure project of a considerable scale.

There are various difficulties and challenges encountered in the course of construction. It is unavoidable that there are deviations from the original plan for individual works contracts. MTRCL has adjusted its works procedures having regard to the actual situation of work sites. Additional manpower and machinery have also been deployed in order to overcome the difficulties. The Government will closely monitor the progress of works and the construction. It will also assist MTRCL to resolve the problems encountered in the course of construction as early as possible and conduct timely reviews of the commissioning programme taking into account the latest situation of the works.

Transport and Housing Bureau Highways Department June 2016



Legislative Council Panel on Transport Subcommittee on Matters Relating to Railways

Progress Update of the Shatin to Central Link (As at 31 March 2016)

INTRODUCTION

This report aims to update Subcommittee members on the progress of Shatin to Central Link ("SCL") as at 31 March 2016.

OVERVIEW OF THE SCL PROJECT

Cost and expenditure

- 2. Since mid-2012, 26 major civil and 26 major electrical & mechanical ("E&M") contracts ¹, together with other minor contracts, have been awarded with a total sum of \$56.288 billion. The contract sums for civil works and E&M works are about \$43.528 billion and \$12.760 billion respectively (Please refer to Enclosure I).
- 3. 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. As previously reported, currently the East-West Corridor ("EWC") and North-South Corridor ("NSC") are expected to be completed in 2019 and 2021 respectively.

Works progress

Overall progress

4. As at 31 March 2016, the overall works for SCL were 53% complete compared to the planned completion rate of 60% against the original project completion target in 2018 for EWC and 2020 for NSC

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.

respectively (Please refer to Enclosure II for details). The progress below is also measured against the original programme. As reported before, the construction works were affected by various factors, including the archaeological works at To Kwa Wan Station site, late land handover in Wan Chai North, and complicated underground conditions of Lion Rock. In the last few months, works have been progressing well in line with the current completion dates for EWC and NSC in 2019 and 2021 respectively.

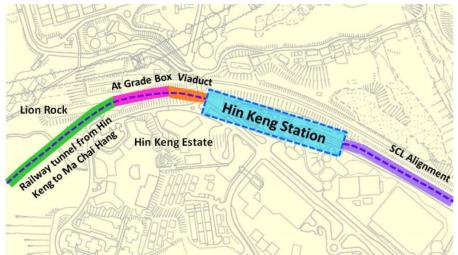
- 5. With the continuous efforts of the construction team, around 69% of the works of the EWC have been completed as at 31 March 2016 compared to the originally planned completion rate of 79%. It is anticipated that EWC will be completed in 2019. Key progress includes:
 - a. The full EWC tunnel is expected to be bored through in the second half of 2016. Upon the completion of the tunnel excavation from To Kwa Wan Station to Ho Man Tin Station in the second half of this year, the excavation of the full EWC tunnel will be completed; and
 - b. The third EWC station topped out. Structural works for the platform and concourse levels of the extended Diamond Hill Station are substantially complete. The Station was topped out in June 2016, which is the third one following Hin Keng Station and Kai Tak Station.
- 6. NSC works have moved beyond the initial stage and are progressing on the right track. With a number of works fronts opening up, NSC was 29% complete in overall terms as at 31 March 2016 compared to the originally planned completion rate of 31%. Notable progress has been made during the reporting period:
 - a. **Modification works of Hung Hom Station southern concourse completed**. The southern part of the concourse was reopened to the public at the end of March 2016;
 - b. "Athena", the first tunnel boring machine ("TBM") on Hong Kong Island, has begun her drive. The tunnel from Causeway Bay Typhoon Shelter ("CBTS") to Exhibition Station is being constructed; and
 - c. The fabrication of the immersed tube ("IMT") pre-cast units is progressing well. All 11 pre-cast units are under

construction and are expected to be completed in the first quarter of 2017. The finished IMT units will then be towed from ex-Shek O Quarry to Victoria Harbour for installation from mid-2017 onwards.

7. In addition to the SCL construction works, delivery of new trains, conversion of existing trains and train tests are progressing as planned. Since the commencement of 8-car train conversion programme of West Rail Line ("WRL") in January 2016, four 8-car trains have been put into service and are running smoothly. At the same time, the related improvement works for the operating railway are also underway, including retrofitting of Automatic Platform Gates ("APG") at the stations of Ma On Shan Line ("MOL"), and platform strengthening works at the stations of East Rail Line ("EAL"). The replacement works of the signalling system of EAL is now in full gear, while installation of signalling equipment and cable laying works for new signalling system are being carried out at the stations and trackside along the EAL during non-service hours.

Progress in different sections

- 8. SCL comprises six sections according to geographical locations -
 - (i) Shatin Section;
 - (ii) Wong Tai Sin Section;
 - (iii) Kowloon City Section;
 - (iv) Hung Hom Section;
 - (v) Cross Harbour Section; and
 - (vi) Hong Kong Island Section.
- (i) Shatin Section (Section of railway between Tai Wai Station and Ma Chai Hang in Wong Tai Sin)
- 9. Fitting out works for Hin Keng Station are at an advanced stage. Installation works of building services and E&M equipment are being carried out in full swing in the station. Track works for connecting the existing track of Ma On Shan Line and Hin Keng Station have been completed.



Location map of Hin Keng Station and associated tunnel structures

10. The structural works of the viaduct structure and at-grade tunnel box have been substantially completed. Fitting out works are in progress and track-laying works will follow.



Hin Keng Station and part of the viaduct

- 11. The tunnel section inside Lion Rock constructed by drill and blast method was broken through in early November 2015. Construction of the internal tunnel structure including partition walls and walkways is in progress with completion at about 50%. Tunnel lining installation is also being carried out concurrently. As at 31 March 2016, around 95% of tunnel lining works was completed.
- (ii) Wong Tai Sin Section (Section of railway between Ma Chai Hang and Kai Tak Station)
- 12. Excavation of down-track TBM tunnel from Diamond Hill to Ma Chai Hang commenced in September 2015. Track-laying in up-track

tunnel was completed in February 2016. The down-track tunnel from Ma Chai Hang to Diamond Hill was successfully bored through in April 2016.



Tunnel breakthrough of TBM tunnel from Diamond Hill to Ma Chai Hang



Track-laying at Diamond Hill up-track tunnel

13. At Ma Chai Hang, excavation for the ventilation shaft was completed at the end of October 2015 and construction of the permanent internal structure is now on-going. Excavation for the ventilation tunnel connecting to the Lion Rock tunnel was completed in mid-January 2016. Tunnel lining works will follow.



Structural works for the ventilation shaft at Ma Chai Hang

- 14. Construction of the Fung Tak Emergency Access Point at the junction of Wong Tai Sin Road and Sha Tin Pass Road is in progress and is expected to be completed by the first quarter of 2017. Major structural works for the adjacent Public Transport Terminus are underway and are expected to be completed in the third quarter of 2016.
- 15. Structural works for the expansion of Diamond Hill Station are progressing as planned. Major structural works for station platform and concourse level have been completed and the works for roof level are in progress. Building services works have also commenced at platform level. The station was topped out in June 2016.



Expansion works for Diamond Hill Station

16. Modification works continue at the existing Diamond Hill Station to transform it into an interchange station of the existing Kwun Tong Line and SCL. The external lift at Entrance A1 is expected to be opened in mid-2016. The first stage construction works of the two pedestrian subways connecting the existing Diamond Hill Station and its extended

part were completed in November 2015. To facilitate the construction of the remaining pedestrian subways works, the temporary traffic diversion of Lung Cheung Road has been implemented in phases starting from end December 2015. The number of traffic lanes at Lung Cheung Road remains unchanged.

17. Track-laying works of the up-track TBM tunnel from Kai Tak to Diamond Hill have been completed. The construction of the cross passage tunnels between the up-track and down-track TBM is underway and is expected to be completed in the third quarter of 2016.



Down-track tunnel from Kai Tak to Diamond Hill

18. As part of the SCL, certain improvement works related to improving pedestrian facilities connectivity to Diamond Hill Station have been entrusted to the Corporation by the Government. This includes the provision of footbridges, covered walkways, lifts and escalators in Tsz Wan Shan area. Tsz Wan Shan is a densely populated area and works site are closed to residential blocks. Some of the facilities and the related temporary traffic management schemes have been revised in order to minimise the potential impacts on the residents. Some works have encountered unexpected and complicated geological condition, as well as complications caused by underground utilities. As a result, the original programme was affected. The contractor is striving to carry out works at different locations in parallel to catch up on the programme. facilities are being opened progressively for public use starting from 2015. The facilities already opened for public in use include the covered walkways at Fung Tak Road and Tsz Hong Estate, the footbridge across Yuk Wah Street, and the lifts at Tsz Hong Estate, Tsz Lok Estate and Tsz Man Estate. Other facilities including the covered walkways and lifts at Po Kong Village Road, the lifts at Lung Poon Street and Tsz Wan Shan Road, and the staircase and escalator at Tsz Lok Estate are expected to be

available for public use in the second half of 2016. Completion of the remaining two facilities at Wan Wah Street and Yuk Wah Street is expected in the third quarter of 2017.

- (iii) Kowloon City Section (Section of railway between Kai Tak Station and Ho Man Tin Station)
- 19. Fitting out, E&M and track works are ongoing at Kai Tak Station. Meanwhile, the structural works for the two station entrances are in progress for completion by the end of June 2016. The cut-and-cover tunnels between Kai Tak Station and To Kwa Wan Station have been completed.



Fitting out and E&M works at Kai Tak Station

- 20. As previously reported, the archaeological works at To Kwa Wan Station have caused a delay of at least 11 months to the original programme of the Tai Wai to Hung Hom Section. The delay recovery measures planned for To Kwa Wan Station, Ma Tau Wai Station and the associated tunnels have been implemented in order to mitigate some of the delay caused by the archaeological works.
- 21. Structural works for To Kwa Wan Station, as well as the excavation and structural works for the adit connecting with the entrance at Nam Kok Road are underway.



Structural works for To Kwa Wan Station

- 22. The TBM "Princess Wencheng" reached Ho Man Tin Station in early April 2016 and completed her drive for the down-track tunnel from To Kwa Wan Station to Ho Man Tin Station. In parallel, the TBM "Princess Iron Fan" is constructing the up-track tunnel and reached Ma Tau Wai Station in February 2016. To advance the movement of "Princess Iron Fan" inside Ma Tau Wai Station and to allow more flexibility on works sequencing, "Princess Iron Fan" was traversing through the station using a hydraulic jacking technique. This technique, which is used in Hong Kong for the first time, saved the time required for the dismantling and re-assembling of the TBM. She will continue her drive towards Ho Man Tin Station after passing through Ma Tau Wai Station.
- 23. Shaft excavation of the emergency access for the railway tunnels near Tam Kung Road is in progress and was about 75% complete.
- 24. At Ma Tau Wai Station, excavation and structural works are ongoing underneath the station roof slab. The slabs for upper platform were built in March 2016 while excavation has proceeded down to the lower platform level. The excavation and structural works for the lower platform are expected to be completed by the first quarter of 2017. To facilitate the construction of the station, temporary traffic management arrangement at Ma Tau Wai Road will continue with two southbound and one northbound traffic lanes continuously open to public.
- 25. Excavation for the four station entrances, which are located at Lok Shan Road, Kiang Su Street, Ma Tau Wai Road (outside To Kwa Wan Market) and the junction between Chi Kiang Street and Ma Tau Wai Road, is in progress. Pipe piling works for the construction of a

ventilation shaft in front of To Kwa Wan Market had been completed and excavation commenced in March 2016. At Chi Kiang Street, excavation of the emergency access shaft was about 15% complete.



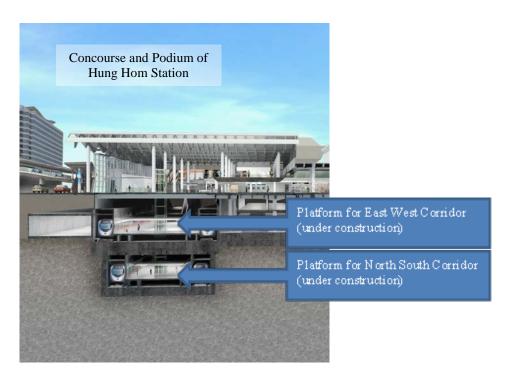
Construction site of Ma Tau Wai Station

- (iv) Hung Hom Section (Section of railway between Ho Man Tin Station and Hung Hom Station)
- 26. Under SCL, two railway tunnels are being constructed north of Hung Hom Station to connect the existing EAL and WRL to form the NSC and EWC respectively. For the future connection from Ho Man Tin Station to Hung Hom Station and the existing WRL, structural works of the tunnel have been substantially completed. For the tunnel connecting with the existing EAL to form NSC, excavation works for tunnels and construction of new tracks near Oi Sen Path south of Princess Margaret Road are now underway.



Tunnel excavation under Chatham Road North and near Winslow Street

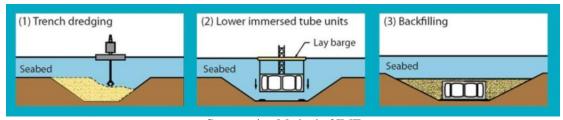
27. To facilitate the future railway operation, noise enclosures will be provided along the new section of tracks near Oi Sen Path. Lifting and installation works of the noise enclosures are now underway and are expected to be completed by the end of 2016. As the construction site is in the vicinity of EAL, the construction team will carry out the works in a prudent manner and review the construction method and the works sequence from time to time to avoid disruption of the existing railway service, as well as minimise any impact on the existing foundations and underground utilities.



- 28. Hung Hom Station will become the interchange station of EWC and NSC of the SCL. To cater for the future railway services, two levels of new platforms designated for EWC and NSC are now being built under the existing station podium. To prepare for the future arrangements, modification works have been carried out at the existing station concourse since September 2014 and stage one modification works were completed in end March 2016. The refurbished southern concourse was opened to the public. Stage two modification works in the northern concourse started in early April 2016.
- 29. The construction works of the new platforms in Hung Hom Station for EWC and NSC are in progress. As previously reported, the works were about four months behind the original schedule due to the complicated geological conditions under the station podium, as well as limited space and headroom available for construction works. The

contractor has deployed additional manpower and re-sequenced the works in order to catch up with the progress. We will ensure that the structural safety of the station and adjoining buildings will be maintained throughout the works.

- 30. To facilitate future railway operations, stabling sidings for EWC trains are now under construction at the former Hung Hom Freight Yard. Construction of tracks slab, building services and E&M works are now underway.
- (v) Cross Harbour Section (Section of railway across Victoria Harbour)
- 31. To extend the existing EAL across the Harbour to Hong Kong Island, a new cross-harbour rail tunnel will be built under the SCL project. A section of the cross-harbour rail tunnel near the seashore at Hung Hom will be constructed by cut-and-cover method within a temporary cofferdam. Temporary decking installation for the cofferdam was complete. Marine pipe piling works are underway to build the temporary cofferdam for the tunnel excavation works, which are expected to commence in the third quarter of 2016.
- 32. The section of the cross-harbour rail tunnel between Hung Hom and CBTS will be constructed by IMT method (See the diagram below).



Construction Method of IMT

33. The fabrication of all IMT pre-cast units is progressing as planned. A total of 11 IMT pre-cast units are being fabricated in the casting yard located at the ex-Shek O Quarry and are expected to be completed in the first quarter of 2017. As at 31 March 2016, about 33% of the fabrication works was completed. The finished IMT units will be stored in the basin and then towed to Victoria Harbour for installation in mid-2017 onwards.



Casting yard of IMT pre-cast units

- 34. The trench dredging works for the section of IMT in Victoria Harbour continue. The dredging works are being carried out in phases in Victoria Harbour until 2017 to prepare for the installation of the IMT units. Backfilling will be carried out after IMT installation.
- 35. To prepare for the installation of the IMT units inside CBTS, pipe piling works commenced in January 2016 outside the breakwater to form a temporary wave barrier and the works were completed in April 2016. Part of the existing breakwater will then be temporarily removed and dredging works within the CBTS will follow. To facilitate the works, moorings within CBTS would be adjusted in June 2016 and relevant stakeholders had been consulted about the changes in the moorings.
- (vi) Hong Kong Island Section (Section of railway on Hong Kong Island ending at Admiralty Station)
- 36. The tunnels on Hong Kong Island are excavated by two TBMs, namely "Athena" and "Zhi-nu". "Athena" was delivered to the TBM shaft in the temporarily reclaimed land at CBTS in January 2016 and has started the tunneling works since late March 2016, heading towards Exhibition Station to deliver the 600-metre-long up-track tunnel. While "Zhi-nu" is expected to be delivered to the temporarily reclaimed land at CBTS in June 2016 for assembly and will start the construction of the down-track tunnel by the end of 2016.
- 37. At the works site of Fenwick Pier Street, the excavation of the TBM shaft is in progress as scheduled. "Athena" will be re-assembled at this shaft after finishing her up-track tunnelling works from CBTS to Exhibition Station, and then head towards Admiralty Station for the around 450-metre-long up-track tunnel in the second quarter of 2017.

- 38. To ensure smooth operation of the TBM, any underground obstructions below the reclaimed areas have to be removed as part of the preparatory works including diversion of underground utilities, bridge underpinning and ground stabilisation works along the tunnel alignment passing through Tunnel Approach Rest Garden and the former Wan Chai West Preliminary Treatment Works. Pile extraction at Wan Shing Street started in mid-January 2016 and is expected to be completed in the third quarter of 2016, together with the associated ground treatment works.
- 39. At the former Police Officers' Club ("the Club") in Causeway Bay, foundations works for the ventilation facilities for the SCL cross-harbour tunnel and the Club are progressing as scheduled. The foundation works are expected to be completed by the fourth quarter of 2016. The area is also used to support the TBM works at the temporarily reclaimed land at CBTS. Upon completion of railway tunnel construction, the Club will be reinstated and integrated with the ventilation facilities
- 40. In the Wan Chai North area, the Exhibition Station will be located under the former Public Transport Interchange ("PTI"), the former Wan Chai Swimming Pool and the Harbour Road Sports Centre. Construction works for the diaphragm walls of Exhibition Station and relevant railway facilities are underway. In this connection, temporary traffic management arrangements will be implemented in phases along Convention Avenue, Fleming Road, Expo Drive East and Tonnochy Road starting from the first half of 2016. Traffic lanes of the abovementioned roads will be diverted in phases while the number of traffic lanes will remain unchanged at peak hours.
- 41. The construction of the temporary footbridge connecting Great Eagle Centre/ Harbour Centre with the ex-Wan Chai Ferry Pier was completed open to public in mid-June 2016. The existing footbridge would be demolished to facilitate the construction of Exhibition Station.
- 42. Regarding the large metal object found on the seabed within the reclamation area under the Wan Chai Development Phase II ("WDII") project, the Civil Engineering and Development Department ("CEDD") removed it from the reclamation site in June 2015 to allow resumption of the reclamation works and relevant works. Originally, the reclaimed land will be handed over to the contractor of SCL at the end of December 2016. As the discovery of the metal object has affected the progress of reclamation works there, CEDD indicates that the handover date of part of the works areas would be deferred by seven months. The Highways

Department ("HyD") and the Corporation will maintain liaison with CEDD on the handover arrangement of works areas.



Exhibition Station Construction Site

- 43. As previously reported, CEDD estimated that the handover date of the associated critical works sites adjoining the junction of Expo Drive East and Convention Avenue would be deferred for about six months. Since then, CEDD continues to implement measures with a view to catching up with part of the works progress in order to hand over the other works sites to SCL in accordance with the original schedule. Further discussion will be held among HyD, CEDD and the Corporation regarding the remaining work sites.
- 44. According to the latest information on the site handover schedules provided by CEDD and progress of the enabling works at Exhibition Station mentioned above, the Corporation has explored possible measures to improve the progress, and will continue maintain close communication with relevant government departments. We will closely monitor the latest situation regarding the timing of handing over works sites and strive to minimise the risks of delay. It is anticipated that the delay of six months in the completion of Exhibition Station will bring the current completion of NSC to 2021.
- 45. For the construction of Exhibition Station, the current Harbour Road Sports Centre and Wan Chai Swimming Pool need to be reprovisioned. Upon completion of the reprovisioning works of the swimming pool in October 2015, the construction of the new Sports Centre and Exhibition Station have commenced at the former swimming pool area. As at 31 March 2016, the foundation works of the new Sports

Centre have been completed and sub-structure works including installation of underground utilities are now underway.

NEW TRAINS

46. New trains for NSC are being delivered to Hong Kong in batches. Stringent testing and commissioning for the delivered new trains are underway at Ho Tung Lau Depot. From December 2015 onwards, dynamic testing is also underway at the existing EAL during non-service hours. New trains are equipped with new design features including dynamic route map and gangway end display system.



New trains of NSC

47. Apart from the procurement of new trains, the existing WRL trains are being gradually converted into 8-car trains to facilitate the 8-car train operation in EWC. A total of four 8-car trains have been put into service on WRL. The conversion of the 28 WRL trains will last for 30 months and is expected to be completed in 2018. When all 8-car trains are in service in 2018, the overall capacity on the WRL will be enhanced by about 14%.



Conversion of WRL trains

IMPROVEMENT WORKS FOR THE OPERATING RAILWAY FACILITIES

48. To facilitate the 8-car train operation on EWC, extension of platforms and roofs are being carried out at stations along MOL. The works commenced in 2012 and are expected to be substantially completed by end 2016. The retrofitting works of APGs for MOL at Tai Wai Station were completed in February 2016, and retrofitting works are on-going at Che Kung Temple Station, Sha Tin Wai Station, City One Station, Shek Mun Station, Tai Shui Hang Station and Heng On Station. The Corporation is committed to completing the retrofitting works of APGs in the stations of MOL in 2017, one year earlier than originally scheduled.



Retrofitting works of APGs at Tai Wai Station were completed

49. The retrofitting of APGs will also be carried out for EAL. Before the commencement of the retrofitting works, platforms have to be strengthened in advance and equipment rooms for the relevant signalling system and facilities have also to be constructed. To avoid interrupting normal train services, most of the works can only be carried out overnight after normal train service hours. Platform strengthening works from Sheung Shui Station to Fo Tan Station have been substantially completed. Works are underway in phases in the remaining stations of EAL as planned. Construction of equipment rooms for the signalling and communication systems in EAL stations is also in progress while the works at Sha Tin Station, Racecourse Station, University Station, Tai Po Market Station, Tai Wo Station, Fanling Station, Sheung Shui Station and Lo Wu Station have been completed.



Platform strengthening works along EAL

50. To facilitate the future operation of new trains and APGs, the existing signalling system of EAL has to be upgraded. The upgrading works are being implemented progressively in phases while installation of equipment compatible with the new signalling system at trains and trackside are underway. As the signalling system involves tens of thousands of electronic components, there are risks in the replacement of signalling systems which cannot be totally eliminated. Major signalling system upgrades may cause system to become unstable and the railway service may be more vulnerable to service delay and interruption. During the initial changeover periods, such problems are experienced in signalling upgrade on replacement projects in railways elsewhere. Overseas experience shows that some railways would suspend their services for signalling upgrade to minimise such risks. While EAL services are essential for passengers, suspension of EAL service in Hong

Kong is infeasible. This poses significant challenges given the complexity of the works and the limited time available outside traffic hours. Thus, it is crucial and rather challenging to complete a smooth upgrade of the signalling system of EAL while minimising the risk of exposing the railway service to the impact of the works. A comprehensive risk assessment of the upgrade of the signalling system is being conducted. The possible risks and contingency measures are being carefully examined having regard to the existing contingency mechanism for handling railway service disruptions. The most important task is to ensure that railway safety is not compromised. The Corporation will appoint independent experts to offer advice in this respect. It is also required to submit a risk assessment report to the Electrical and Mechanical Services Department ("EMSD") to ensure that international safety standards are met. Also, the Corporation's contingency plan on railway service disruption will be subject to the agreement of the Transport Department. Thorough tests will be carried out prior to the commissioning of the system while the testing is expected to be conducted in phases starting from the third quarter of 2016. While every precaution has been taken to avoid impact on the operating railway, teething problems during the replacement works may occur. The projects team and railway operation team will closely monitor the situation to ensure that any hiccups will be tackled in a timely manner and safety will be upheld at all times.





Signalling upgrade along EAL

51. Modification and extension works of the existing Pat Heung Depot were substantially complete. The extension of the Maintenance Building and Ancillary E&M Plant Building has been completed and already put into operation. The stabling siding for EWC trains has been built.

STAKEHOLDER COMMUNICATION AND ENGAGEMENT

- 52. Most of the SCL works sites are in urban areas and close to local communities. We attach great importance to 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.
- 53. Apart from the regular progress updates to the Subcommittee members and respective District Councils, another major channel for communicating with the local communities is the Community Liaison Groups ("CLGs"), which have been set up across districts to provide regular updates on possible impacts of works relating to the SCL. Members of the CLGs include representatives of local District Councils, schools, local organisations, etc. Representatives from government departments sitting in the CLGs include the Highways Department, Hong Kong Police Force, Transport Department, Lands Department and Home Affairs Department. Newsletters, leaflets and notices are also distributed to the local communities to provide updated information about the SCL. Dedicated MTR and Contractors' Hotlines are also available for handling any enquiries and complaints in relating to the project; while the SCL Information Centre in To Kwa Wan has also handled nearly 1,000 enquiries since October 2012.

EMPLOYMENT OPPORTUNITIES

As at 31 March 2016, about 7,155 construction workers and technical/ professional staff members are employed for the SCL project. Labour shortage continues to pose challenges to the project. To attract new blood to join the construction industry, the Corporation has initiated the "SCL Contractors Cooperative Training Scheme" in 2012. Under the Scheme, all SCL civil works contracts require contractors to recruit a specified amount of trainees. Training and internship programmes are provided to the trainees by the contractors of SCL and the Construction Industry Council. After passing relevant trade tests, the graduates would be offered a minimum 12-month employment contracts on the SCL. So far, the scheme has provided training to 626 trainees with 393 having completed the trade test and continuing their careers in the field.

CONCLUSION

55. Members are invited to note the above information.

MTR Corporation Limited June 2016

Expenditure report as at 31 March 2016

<u>Table 1 – Situation of expenditure</u>

	Awarded contract sum for the contracts (\$ million)	Cumulative expenditure of awarded contracts (\$ million)	Estimated amount of unresolved claims* (\$ million)
Civil works	43,527.8	25,389.8	1,947.0
E&M works	12,760.4	2,103.2	0.9
Total	56,288.2	27,493.0	1,947.9

^{*} The estimated amount of unresolved claim: Amount claimed (\$2,169.7 million) – Interim award (\$221.8 million) = \$1,947.9 million (See Table 2)

Enclosure I

Table 2 – Situation of substantiated claims

	Claims resolved			Claims unresolved		
	Number	Amount claimed (\$ million)	Amount awarded (\$ million)	Number	Amount claimed (\$ million)	Interim award (\$ million)
Civil works	20	82.6	41.5	301	2,168.8	221.8
E&M works	6*	0	0	32	0.9	0
Total	26	82.6	41.5	333	2,169.7	221.8

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

- 1. The Government and the Corporation conducted risk assessment at the planning and budgeting stages of the project to minimise claims arising from the works. Nevertheless, there were often unforeseeable situations in the course of works. For instance, the foundation or excavation works might come across a larger amount of or more complicated obstructions than expected. As this would add difficulties to the works, the contractors might have to use more machines or switch to other machines that were more suitable and employ more staff to cope with these situations. The contractors would submit claims in accordance with the contract terms to cover the additional expenditures. Upon receipt of claims from contractors, the corporation would examine such claims and assess the amount concerned based on the relevant contract terms, justifications, documents, records, etc.
- 2. As at 31 March 2016, the Corporation received 359 substantiated claims and the amount claimed in total was about \$2,252.3 million, representing 4.0% 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 2016, 26 cases were resolved and about \$41.5 million was awarded, representing about 0.07% of the awarded contract sum for the contracts. Having regard to the needs of individual works and progress of the relevant assessment and discussion, interim award amounting to about \$221.8 million was made for some cases.

Enclosure II

Overall works progress of the SCL as at 31 March 2016

Overall works completed: 53%

Percentage completed as originally planned (1): 60%

(A) Culminated progress of 25⁽²⁾ major civil contracts awarded:

Contract No.	Contract Name	Percentage completed
1101	Modification of Ma On Shan Line	97%
1102	Hin Keng Station and Approach Structures	93%
1103	Hin Keng to Diamond Hill Tunnels and Fung Tak Public Transport Interchange	85%
1106	Diamond Hill Station Extension	75%
1107	Diamond Hill to Kai Tak Tunnels	99%
1108	Kai Tak Station and Associated Tunnels	94%
1108A	Kai Tak Barging Point Facilities	93%
1109	Stations and Tunnels of Kowloon City Section	64%
1111	Hung Hom North Approach Tunnels	79%
1112	Hung Hom Station and Stabling Sidings	74%
1113	Reprovisioning of New Territories South Animal Management Centre and Shatin Plant Quarantine Station	100%
1114	Pedestrian Links at Tsz Wan Shan	71%
1117	Pat Heung Depot Modification Works	99%
1119	Trackwork and Overhead Line Modification Works at Lo Wu and PHD	100%
1120	Trackwork and Overhead Line for SCL Phase 1	35%
1121	North South Line (NSL) Cross Harbour Tunnels	36%
1122	Admiralty South Overrun Tunnel	Less than 1% ⁽³⁾
1123	Exhibition Station and Western Approach Tunnel	11%
1124	Admiralty SCL Related Works	Less than 1% ⁽⁴⁾
1125	Police Sports and Recreation Club Enhancement Works	100%

1126	Reprovisioning of Harbour Road Sports Centre and Wan Chai Swimming Pool	71%
1128	South Ventilation Building to Admiralty Tunnels	29%
1129	SCL - Advance Works for NSL	100%
11209	Platform Modification and Associated Works at East Rail Line	72%
11227	Advance Works for NSL Cross Harbour Tunnels	100%

Note:

- (1) The original programme is to commission the Tai Wai to Hung Hom Section and the Hung Hom to Admiralty Section in December 2018 and December 2020 respectively.
- (2) The 26 awarded major civil contracts as mentioned in Paragraph 2 of this report include Contract 11230, which is a tenancy agreement for the Joint Site Office for Contracts 1123 and 1128. This contract is part of the project cost for Contracts 1123 and 1128. As it involves no civil construction works, it is not included in the table above.
- (3) Civil Contract 1122 was awarded on 19 October 2015.
- (4) Civil Contract 1124 was awarded on 10 March 2016.

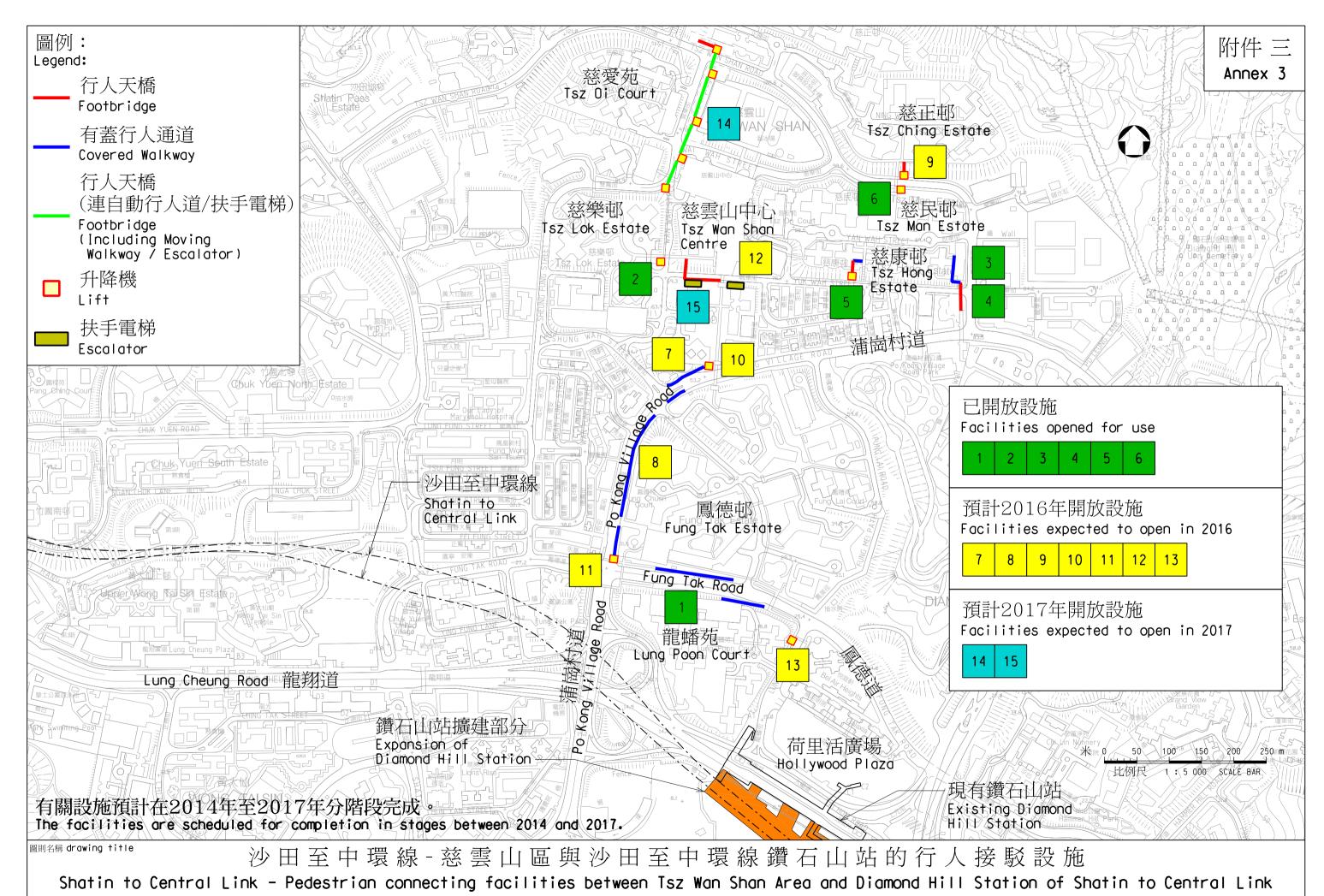
(B) Culminated progress of 26 major E&M contracts awarded:

Contract No.	Contract Name	Percentage completed
1141A	New Rolling Stock for SCL Phase 1	52%
1141B	New Rolling Stock for SCL Phase 2	26%
1151	Rolling Stock Modification and New Train Cars for SCL Phase 1	43%
1152	Signalling System for SCL Phase 1 & Signalling System Modification for MOL and WRL	60%
1152B	Signalling System for SCL Phase 2	47%
1153	Tunnel ECS for SCL Phase 1	36%
1153B	Tunnel ECS for SCL Phase 2	12%
1154	Platform Screen Doors for SCL Phase 1 & APG Retrofit for MOL	55%
1155	Power Supply System and Trackside Auxiliaries for SCL Phase 1	46%
1155B	Power Supply System and Trackside Auxiliaries for SCL Phase 2	11%
1159	Lifts for SCL Phase 1	36%
1162	TETRA System for SCL Phases 1 & 2	69%
1162B	Radio Distribution Network System for SCL Phases 1 & 2	24%
1163	AFC System and SAM System for SCL Phases 1 & 2	17%
1164	Building Services for Diamond Hill Station	31%
1165	Building Services for Hin Keng Station, Ma Chai Hang Ventilation Building and Fung Tak Emergency Access	53%
1166	Main Control System for SCL Phase 1	65%
1166B	Main Control System for SCL Phase 2	14%
1169	Communications System for SCL Phase 1	60%
1172	Escalators for SCL Phase 1	34%
1173	Building Services for Hung Hom Station and Hung Hom Stabling Sidings	42%
1175	Building Services for Kai Tak Station	72%

1176	Building Services for To Kwa Wan Station and	22%
1170	Ancillary Building	2270
1177	Building Services for Ma Tau Wai Station and	24%
	Ancillary Building	2170
1183	EAL Signalling System Modification for SCL	100%
1191	Floodgate System for SCL Phase 2	Less than 1 % (5)

Note:

(5) E&M Contract 1191 was awarded on 8 January 2016.

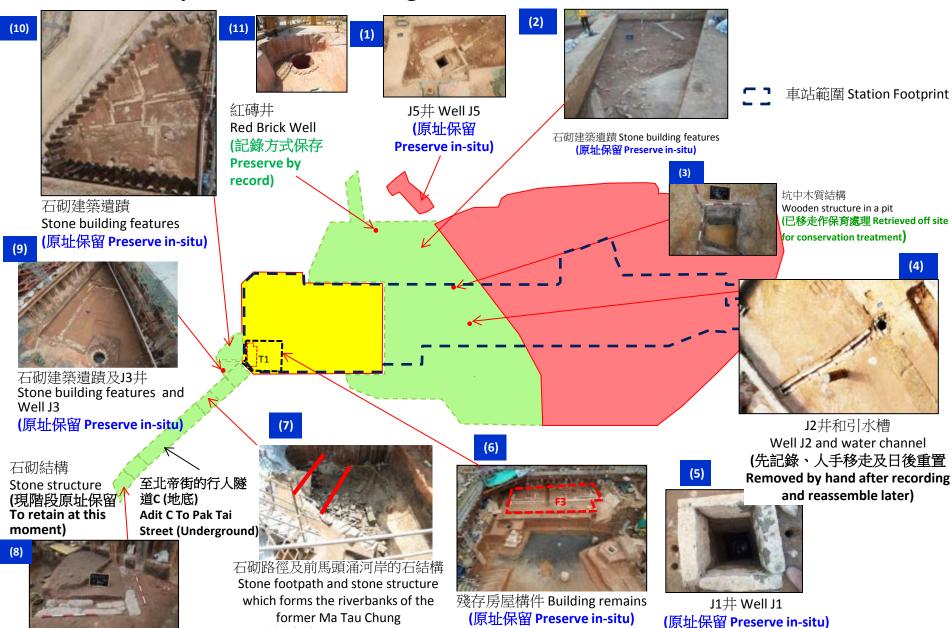


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土瓜灣站工地考古文物保育方案

附件 四 Annex 4

Conservation Options for Archaeological Features Discovered at To Kwa Wan Station



(原址保留 Preserve in-situ)

行人隧道 C 的走線 Alignment of Adit C

