

Legislative Council Panel on Transport
Subcommittee on Matters Relating to Railways
Progress update of the Shatin to Central Link,
South Island Line (East) and Kwun Tong Line Extension

Introduction

This paper is to report to the Members the progress of the main construction works of the Shatin to Central Link ('SCL'), South Island Line (East) ('SIL(E)') and Kwun Tong Line Extension ('KTE').

Background

The SCL

2. The SCL, with a total length of 17 kilometres (km), 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. The SCL will have ten stations. Apart from 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 (the Exhibition) and Admiralty. It is a territory-wide strategic railway project (alignment layout at **Enclosure 1**).

4. The estimated construction cost for the entire SCL project is about \$79,800 million (in the MOD prices) and is funded by the Government under the "concession approach". On 11 May 2012, the Finance Committee of the Legislative Council approved the funding application 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 SCL to the latter. The MTRCL has been entrusted to provide management and monitoring service to the SCL project. According to the agreement, the target commissioning date for the Tai Wai to Hung Hom Section is December 2018 while the target commissioning date for the Hung Hom to Admiralty Section is December 2020.

The SIL(E)

5. The SIL(E) is a new railway corridor from South to North of Hong Kong Island. It starts from South Horizons on Ap Lei Chau to Admiralty via Lei Tung, Wong Chuk Hang and Ocean Park. The overall length is about seven kilometres [the alignment is at **Enclosure 2**]. The SIL(E) will connect MTR Island Line, Tsuen Wan Line and the future SCL at Admiralty Station and the existing Admiralty Station will be expanded to form an integrated station for the four lines to provide seamless interchanges for passengers. According to the estimate in 2011, the estimated capital cost of the SIL(E) is \$12,400 million (in December 2009 prices).

The KTE

6. The KTE is a 2.6-kilometre long railway extension of the existing MTR Kwun Tong Line from Yau Ma Tei Station to the new Ho Man Tin Station and Whampoa Station [the alignment is at **Enclosure 3**]. According to the estimate in 2011, the estimated capital cost of the KTE is \$5,300 million (in December 2009 prices).

7. The SIL(E) and KTE, being the extensions of the existing railway networks owned by the MTRCL, are ‘ownership’ projects. Under the ‘ownership’ approach, the MTRCL will be responsible for the financing, design, construction, operation and maintenance of these railway projects and will own the railways. The Government and the MTRCL signed the Project Agreement for the SIL(E) and KTE in May 2011 and the target commissioning dates for the SIL(E) and KTE are December 2015 and August 2015 respectively.

8. As the construction cost of railways is so enormous that the SIL(E) and KTE are not considered financially viable based on their fare and non-fare revenues alone. Funding support to the MTRCL is required from the Government to bridge the funding gap of the projects.

9. To implement the SIL(E) and KTE, the Government granted the property development rights under ‘the Rail-plus-Property Model’ to bridge the funding gaps of the projects with caution that the land to be granted to the MTRCL should not be more than what is required to bridge the funding gaps. As such, the Government, in 2011, granted the topside property development rights at Wong Chuk Hang Depot and Ho Man Tin Station for the implementation of the SIL(E) and KTE respectively.

10. With the granting of the property development rights to the MTRCL, the MTRCL is responsible for all the cost of the property development as well as the construction and operating costs of the railway projects. In addition, the MTRCL has to bear long term risks in financing the projects, operating the railways, and market fluctuations in rail and property developments. The design philosophy of the ‘Rail-plus-Property Model’ is to strike a fair balance of risks and benefits between the Government and the MTRCL.

11. In order to cope with the commissioning of the SIL(E) and KTE, the Government also entrusted the implementation of the associated ‘Essential Public Infrastructure Works’ (EPIW) to the MTRCL. These include construction and improvement of the pedestrian and linking facilities for providing safe, convenient and barrier-free access to the railway stations, such that the consequential social and economic benefits of the SIL(E) and KTE can be fully realized. The EPIW, which are constructed in parallel with the railway works, include:-

- (i) the construction of a public transport interchange underneath the Wong Chuk Hang Station; improvement of the road network in the vicinity of Ocean Park Station and Wong Chuk Hang Station;
- (ii) modification of a section of Wong Chuk Hang Nullah from Ocean Park Road to Nam Long Shan Road;
- (iii) construction of a covered footbridge connecting Wong Chuk Hang Station with the adjacent industrial area, a cover footbridge linking the western part of Ap Lei Chau Estate to Yi Nam Road near the Precious Blood Primary School;
- (iv) construction of a pedestrian link to the Aberdeen Channel Promenade and improvement of the road junctions of Ap Lei Chau Drive and Ap Lei Chau Bridge Road
- (v) construction of a pedestrian link system connecting Ho Man Tin Station to the Ho Man Tin Estate, Oi Man Estate and the Hung

- Hom area south of Chatham Road North, which includes covered footbridges, covered walkways and a subway;
- (vi) construction of a footbridge integrating with the existing footbridge across Chatham Road North and connecting Ho Man Tin Station to Wuhu Street; and
 - (vii) construction of a public transport facility at Chung Hau Street near Ho Man Tin Station.

Latest Progress of the Works

12. The MTRCL has submitted the progress reports for the three railway projects up to 30 September 2014 (the report for the SCL is at **Enclosure 4** while the report for the SIL(E) and KTE is at **Enclosure 5**). The analysis and supplement made by the HyD on these progress reports are provided below.

The SCL

“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)

13. The progress of Hin Keng Station, the associated connecting enclosed trackworks and the modification of station platforms of Ma On Shan Line are generally in line with the planned programme. The foundation works of Hin Keng Station is completed with smooth progress. The advance excavation works of Hin Keng to Ma Chai Hang tunnel is behind schedule due to difficult ground conditions. Up to end September this year, the tunnelling works has a delay of about 2 to 3 months while the advance excavation works has already been completed.

14. In view of the delay in constructing the tunnel, the MTRCL has implemented a series of measures to expedite the progress which includes excavating part of the tunnel by drill and blast method instead of mechanical excavation, erecting noise enclosure at the tunnel shaft to extend the working hours for blasting and widening of access road near the Hin Keng tunnel portal

such that the contractor can dispose excavated materials in a better way in order to avoid the stockpiling of the excavated materials inside the tunnel, thereby affecting the construction of the tunnel. Furthermore, the MTRCL has also suggested changing the sequence and method for the drill and blast works, such that the drill and blast operation as well as the tunnel construction can be implemented simultaneously to catch up the original programme as much as possible.

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

15. The two sections of tunnels from Kai Tak Station to Diamond Hill Station and from Diamond Hill Station to Ma Chai Hang will be constructed by tunnel boring machine (TBM). The excavation works already commenced in the third quarter this year and the progress is good. However, in view of the great difficulty and complexity of these tunnelling works, an experienced construction team is required to ensure smooth progress and avoid delay. With the assistance from the HyD, the MTRCL has obtained the approval for importing the required technical staff under the “Supplementary Labour Scheme”¹ to fill the vacancies of the tunnelling works.

16. The diaphragm wall for the Diamond Hill Station has been completed. At present, the contractor has adjusted the construction sequence and method for implementing the excavation works of the station in phases. Amongst these phased excavation works, the excavation for the TBM receiving shaft has commenced. It is expected that the excavation can be completed before the arrival of the TBM in order to cope with the tunnelling works from Kai Tak Station to Diamond Hill Station

17. To enhance the facilities for connecting Tsz Wan Shan area and SCL Diamond Hill Station, the MTRCL is carrying out improvement works to the pedestrian facilities within the district. The works is originally scheduled for completion in stages between 2014 and 2016. Due to the unpredicted ground conditions and congested underground utilities, the progress of part of the works is

¹ According to the information provided by the Labour Department, the Supplementary Labour Scheme allows employers with genuine difficulties in finding suitable staff locally to import workers at technician level or below. However, to ensure the priority of local workers in employment and to safeguard their salaries and benefits, employers must accord priority to fill available job vacancies with local workers and make active efforts to train up local workers for the vacancies.

suffering delay. In addition to revising the design for reducing the diversion of utilities and construction activities, the MTRCL has requested the contractor to deploy additional machinery and manpower as well as adjust the sequence of construction for part of the walkway in order to catch up the programme as far as possible. Currently, part of the covered walkway on Fung Tak Road has been completed and opened for public use.

Kowloon City Section (Section of tunnel between Kai Tak Station to Ho Man Tin Station, including To Kwa Wan Station and Ma Tau Wai Station)

Kai Tak Station

18. Kai Tak Station is located inside the Kai Tak Development Area. The construction of the main structure of the station commenced early this year. Part of the platform structure has been completed. The main structure of the station is anticipated to complete by end 2015.

To Kwa Wan Station

19. Under the close supervision of the Antiquities and Monuments Office (AMO), the independent archaeologist team completed the archaeological excavation at end September 2014. In this regard, the Government reported to the Antiquities Advisory Board (AAB) on 20 November and will brief the Development Panel of Legislative Council on 25 November on the archaeological findings, the preliminary preservation and interpretation scheme and the associated modification in station design and construction method. The details are at **Enclosure 6**. Up to end November, the delay and additional cost to the SCL caused by the archaeological works are tabulated below:

Item	Adjustments made to the SCL because of the expansion of the extent of archaeological work	Delay to works of the Tai Wai to Hung Hom section of the SCL	Additional Cost to SCL work@
1	Unavoidable adjustments to the SCL works for facilitating the expanded archaeological work between Dec 2013 and end-Sep	At least 11 months	About \$3.1 billion

	2014 (For details, please refer to paragraph 21(a) to (d) of Enclosure 6)		
2	Adjustments to the SCL works for adopting the proposed conservation options under Items 2 to 3, 5 to 7 and 9 to 11 of Table 1 of Enclosure 6 (not including Well J2 and the water channel, and the stone structure at the southern end of Adit C) (For details, please refer paragraph 22(a) to (d) of Enclosure 6)	Will delay the construction period of To Kwa Wan Station but no further additional delay to the SCL	Additional cost of about \$1 billion
3	Adjustments to the SCL works for adopting 4 conservation options for Well J2 and the water channel (please refer to Table 2 and Enclosure 4 of Enclosure 6)		
	Option 1:	No further additional delay	Additional cost of about \$10 million
	Option 2:	At least 4 months additional delay	Additional cost of about \$0.8 billion
	Option 3:		Additional cost of about \$1.3 billion
	Option 4:		Additional cost of about \$1.2 billion
	Cumulative impact on the works from Items 1 to 3 above:	▪ At least 11 months (Option 1)	▪ About \$4.1 billion (Option 1)

		<ul style="list-style-type: none"> ▪ At least 15 months (Options 2 to 4) 	<ul style="list-style-type: none"> ▪ About \$4.9 to 5.4 billion (Options 2 to 4)
4	<p>Conservations options for the stone structure at the southern end of Adit C</p> <ul style="list-style-type: none"> ▪ As the alternative tunnel alignment is yet to be confirmed, as mentioned in paragraph 17 to 19 of Enclosure 6, assessments on the corresponding adjustment on works cannot be made at this stage 	<p>Will affect only the construction of Adit C and no impact on the completion date of To Kwa Wan Station</p>	<p>Assessments cannot be made at this stage</p>

@It does not include the cost required for future display of relics.

20. If the conservation option could not be finalized by early December 2014, it is estimated that the construction cost will be increased by about \$250 million for every month delay in making the decision. The works will be affected with the corresponding delay.

21. To conclude, depending on adopting which conservation option for the archaeological artefacts and features, the Tai Wai to Hung Hom section of the SCL currently has a delay of at least 11 to 15 months while the additional construction cost is at least \$4.1 to \$5.4 billion.

Ma Tau Wai Station

22. Ma Tau Wai Station is an underground station beneath Ma Tau Wai Road, the major traffic corridor at Kowloon East with old buildings on both sides. In the past two years, the MTRCL has focused on the construction of the diaphragm wall at the section of Ma Tau Wai Road between Chi Kiang Street and Sheung Heung Road. The construction work involves various difficult tasks, including the implementation of large scale temporary traffic management schemes on Ma Tau Wai Road, extensive utilities diversion works and unpredicted geological conditions. According to the present progress of the works, the diaphragm wall

construction has suffered a delay of about 5 months and the MTRCL has progressively increased the equipment and manpower on site, as well as rearranging the sequence of some construction activities at Ma Tau Wai Road in order to catch up with the progress. It is expected that the diaphragm wall of the station at the western side of Ma Tai Wai Road will be completed by the end of this year. Furthermore, part of the excavation works for the station and the structure works for the roof of the station were gradually commenced this month.

Hung Hom Section (Section of the tunnel from Ho Man Tin Station to Hung Hom Station, including the reconstruction of Hung Hom Station and associated tunnelling works)

23. As the tunnelling works of the SCL to the north of Hung Hom Station has to be carried out on a very busy road and along the operating East Rail Line, the construction works has to be carried out with due care to avoid affecting the busy road sections nearby. Currently, the progress of part of the pipe-piling works at Chatham Road North is suffering delay. The MTRCL has instructed the contractor to deploy additional machinery and manpower in order to catch up the programme as much as possible. For the construction works at Hung Hom Station, since the works has to be carried out underneath the existing station podium, the construction works is highly difficult and have to be carried out in a prudent manner. According to the current progress, the works at Hung Hom Station is suffering a delay of about 3 months. The MTRCL has instructed the contractor to revise the construction sequence and method as well as increase the machinery and manpower in order to catch up the programme as far as possible.

“Hung Hom to Admiralty Section”

Cross Harbour Section and Hong Kong Island Section (Cross Harbour Section is the tunnel section across the Victoria Harbour; Hong Kong Island Section is the tunnel section to Admiralty Station on Hong Kong Island, including Exhibition Station)

24. The advance works for the Hong Kong Island Section includes the re-provisioning of Harbour Road Sports Centre and Wan Chai Swimming Pool, and the alternation works for footbridges and box culvert at the Cross Harbour Tunnel Portal Rest Garden. These works have commenced in stages since June

2013 and proceeded as planned. In order to cope with the construction of immersed tubes for the cross harbour tunnel, the MTRCL has implemented a number of advanced works since the third quarter of 2014, including the drilling works, excavation of investigation trenches and removal of hard soil in conflict with the alignment of the tunnel of SCL at the seabed of Victoria Harbour. The associated works is currently at good progress and expected for completion by end 2014. Besides, within the Causeway Bay Typhoon Shelter, the protection works for the SCL under the Central-Wan Chai Bypass project was completed at the third quarter of 2014. The contract for the tunnel works of the Hong Kong Island Section has been awarded and the construction works commenced in August 2014. Also, the tendering exercise for the Cross Harbour Section is being conducted and the construction works is expected to commence by end 2014.

25. In order to cope with the construction of the Exhibition Station, the Wan Chai North Public Transport Interchange has to be temporarily relocated to a newly reclaimed land. The construction of the temporary public transport interchange has been implemented in stages since October 2014. To allow flexibility for potential topside development in the future, enabling works would be incorporated into the underground structure of Exhibition Station. It might have programme implication on the SCL project. The tendering exercise for the works of Exhibition Station is being conducted and the tenderers are required to explore measures to minimize the impact on the works.

26. To cater for the reclamation works and the tunnel works of the Central-Wan Chai Bypass under the Wan Chai Development Phase II, the handover date for the associated critical site areas adjoining the junction of Expo Drive East and Convention Avenue has a delay of 6 months as compared with the original programme. The last piece of these critical site areas might only be handed over to the SCL contractor for construction by early 2017. Together with the heavy road traffic at Wan Chai North, the implementation of the main construction works for the Exhibition Station will be highly complicated and there are concern amount of risks to the construction programme. To reduce the programme risk so induced, the HyD is closely monitoring the progress of the tunnel works and the reclamation with a view to facilitating timely identification of possible measures for catching up the progress. In the meantime, the MTRCL has also required the tenderers to explore improvement measures with a view to mitigate the delay in the Hung Hom to Admiralty Section of the SCL as much as possible.

27. To summarize the above assessment (paragraphs 13 to 24), the Tai Wai to Hung Hom Section of the SCL may have a delay of at least 11 to 15 months; while the Hung Hom to Admiralty Section has a risk in completing the works by the end of 2020 as scheduled. The MTRCL would explore with the contractors for feasible measures for improving the progress.

The SIL(E)

28. The expansion work at Admiralty Station for the SIL(E) involves the addition of three underground levels below Harcourt Garden east of the existing station and the construction of a 200m long overrun tunnel for the SCL. The additional three underground levels include one level for interchange and two levels for train platforms. The platforms at upper level are reserved for the use of the SCL while the platforms for the SIL(E) are at the lowest level. After expansion, the Admiralty Station will become an interchange station serving the passengers from the SCL and SIL(E). Hence, its construction cost will be shared between the two projects. For the construction works, the MTRCL has carried out excavation work for the expansion at Harcourt Garden site with cut-and-cover method before the commencement of the structural work for the station. When safety must be given the highest priority, it is a big challenge to carry out the excavation underground where there are existing train station, tunnels in use and foundation of many buildings. In the process of excavation, it is found that the actual spacing of joints in rock is less than the estimation from ground investigation reports. In other words, the level of weathering of the rock is less than that estimated. This in effect makes the excavation more difficult. Furthermore, in order to connect the expansion part with the platforms of the SIL(E) and SCL, underpinning works for the existing tunnel of the Island Line has to be carried out for excavation underneath.

29. Up to end October 2014, the main excavation works under the expansion work at Admiralty has substantially completed. However, as affected by the “Occupy Central” event, construction materials could not be delivered to the Harcourt Garden site and the excavated materials could not be handled in time. Hence, the construction of the structure of the station could not commence. Besides, the Mines Division could not deliver explosives to the work site between 29 September to 22 October and the excavation work for the overrun tunnel of the SCL could not be carried out by blasting.

30. Currently, the excavation for the underpinning works beneath the Island Line tunnel is conducted by mechanical excavation method. According to the assessment of the MTRCL during construction stage, in order to further reduce the risk of affecting the operation of the Island Line by the underpinning works, more reinforcing works and temporary supporting works have to be carried out as compared to the planned. Hence, the construction time has to be largely lengthened. Up to end September 2014, the delay of the underpinning works has been getting larger because of the excavation rate has been kept lagging behind the target progress. According to the observation by the HyD, the difficulty in excavating the rock by mechanical means has been underestimated in the focus construction programme for the excavation works implemented since May. The actual progress could not meet the target. In order to mitigate the delay, the MTRCL proposed in August 2014 to expedite the excavation for underpinning works by blasting. However, MTRCL is yet to provide further information to the HyD to demonstrate the expected effects of blasting. With reference to the information from the HyD, the delay of 6 months estimated by the MTRCL in June 2014 will be greatly increased according to the projection based on the progress of the underpinning works during mid-June to end September. The HyD will closely monitor whether the MTRCL could avoid further delay and catch up the programme.

31. The Nam Fung Tunnel, which connects the Admiralty Station and the Ocean Park Station, was broken through on 17 October 2014. For the other railway facilities at Wong Chuk Hang and Ap Lei Chau, although there are different levels of delay, they are not as severe as the expansion work at the Admiralty Station. Regarding the EPIW entrusted by the Government to the MTRCL, the new slip road connecting Ap Lei Chau Drive from Ap Lei Chau Bridge Road is expected to complete by the second quarter of 2015, which is half year later than the completion date stated in the entrustment agreement. The progress of this new slip road will not affect the commissioning date of the SIL(E).

32. During the progress meeting on 23 October 2014, the MTRCL informed the HyD that the delay in the expansion works of Admiralty Station would be further increased and the SIL(E) would be targeted to commission by end 2016. Nevertheless, the impacts of “Occupy Central” event to the construction works were still under assessment and revised timetable for commissioning was not yet available for submission to the HyD. The HyD opined that as only 33% of the underpinning works was completed by end October, the target of commissioning

SIL(E) at end 2016 would have a very high risk if there was no significant improvement in the progress.

33. The HyD has repeatedly expressed their grave concerns on the slow progress of excavation for the underpinning works beneath the Island Line and requested the MTRCL to submit progress reports and proposals for recovering the delay of the excavation works. The HyD also repeatedly requested the MTRCL to explain and supplement the method statements and contents of the progress reports on the remaining construction works. Besides, the HyD is actively coordinating other government departments to expedite the progress in approving the blasting proposal of the MTRCL for recovering the delay in underpinning works beneath the Island Line. The HyD will keep close monitoring of the progress of the works.

The KTE

34. Since excavation works at the Ho Man Tin Station of the KTE was carried out by open blasting, and the blasting was in close proximity to the main roads and residential blocks, the protection setup for open blasting works was more complicated than the traditional one. Hence, the excavation works at Ho Man Tin Station could only be completed in April this year. The remaining tunnel blasting works currently being carried out at the west of Ho Man Tin Station is expected to complete by the end of this year. Currently, the MTRCL is carrying out the construction works of the structure and associated electrical and mechanical (E&M) works of the Ho Man Tin Station in full swing by improving the works sequence, increasing manpower and construction plant, and adjusting the E&M and fitting-out works. Besides, the structural works of the tunnel and track laying works are in progress.

35. Regarding the construction work at Whampoa Station, it has to overcome the limitations from the dense population, heavy traffic and congested underground utilities. In addition, there are varying geological conditions underground. Because of the varying geological conditions underground, the temporary supports for the excavation for both the East and West Concourses of Whampoa Station have to be further enhanced and are causing delay. The works is anticipated for completion during the end of this year to early next year. Regarding the excavation for the platform tunnel between the concourses, the works commenced in mid-November for completion in the second quarter next

year.

36. In view of the delay in the construction of the Ho Man Tin Station, the progress of part of the EPIW connecting to the Ho Man Tin Station, including the two pedestrian subways for crossing Fat Kwong Street and Chung Hau Street, as well as the public transport interchange at Chung Hau Street in the vicinity of the Ho Man Tin Station, are affected. Besides, the excavation works for the above two pedestrian subways have encountered varying geological conditions underground and are suffering delay. The MTRCL has adjusted the works sequence, increased manpower and machinery to improve the situation. The above EPIW are expected to be in use when the KTE is commissioning. Regarding the other EPIW not affected by the progress of the works of the Ho Man Tin Station, including the footbridges and covered walkways crossing Chatham Road North, Chung Yee Street, Sheung Lok Street and Fat Kwong Street, it is expected that the works can be completed in mid-2015 as scheduled.

37. The MTRCL is currently reporting and providing information on works progress and challenges to the HyD. The HyD and the MTRCL have progress meetings every month for the MTRCL to report the progress of the various construction contracts and review the implementation of the various items. The officers from HyD are also paying regular site visit to understand the construction progress. Further to discussion with MTRCL, the HyD also coordinates the related government departments to assist in resolving the problems encountered by the MTRCL during the construction works. Through progress meetings and letters to the MTRCL, the HyD has repeatedly expressed its concerns on the persistent delay of the excavation works at the Whampoa Station and requested the MTRCL to provide the progress briefings and detailed works programmes on the major construction activities in order to clarify and supplement on how to realize the remaining works in the construction programme. According to the information of the HyD, the KTE is expected to be commissioned in mid-2016. Nevertheless, as the critical excavation works for the platform tunnel between the East and West concourses of the Whampoa Station is yet to be completed, the MTRCL has to keep reviewing the progress of the works and update the target commissioning date when necessary. The HyD will keep close monitoring the progress of the works.

Conclusion

38. Depending on the options adopted for conserving the archaeological

artefacts and features, the HyD estimates that the Tai Wai to Hung Hom section of the SCL currently has a accumulative delay of at least 11 to 15 months. While the tendering for the works of the station and cross harbour tunnel under the Hung Hom to Admiralty section is still being conducted, there is a risk in completing the works by the end of 2020 as scheduled. As the archeological works at the To Kwa Wan Station will incur delay and additional expenditure in various degrees and the contingency of the SCL project does not cover the extended archeological works as well as the construction costs arising from the archeological findings. Given that the current contingency will not be sufficient for the associated expenditure, we will seek additional funding together with the Development Bureau in due course for keep carrying out the works.

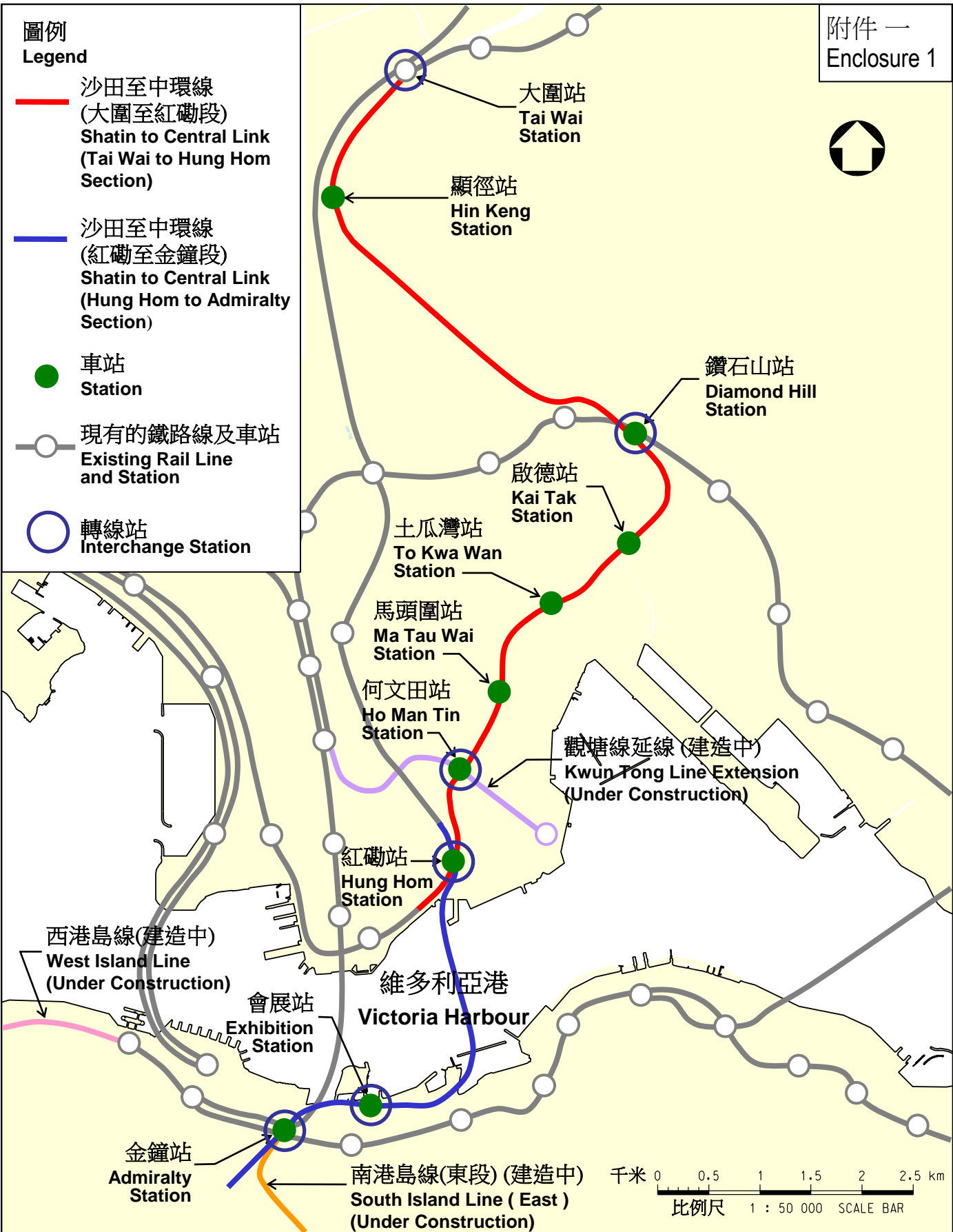
39. Regarding the SIL(E), if the progress of the underpinning works beneath the Island Line at the Admiralty Station has no significant improvement, there is a great risk to the target commissioning at end 2016. For the KTE, as the excavation works for the platform tunnel between the East and West concourses of the Whampoa Station is still in progress and facing the uncertainty in encountering varying geological conditions underground, there are still risks to the target commissioning at mid-2016. In any case, as the SIL(E) and KTE are ownership projects, the MTRCL will bear the additional expenditure arising from the delay of the railway works.

40. The three railway works above are all underground infrastructure projects with considerable scale. Different difficulties and challenges are encountered at the construction stage of these projects. For individual works contracts, there are unavoidable deviations from the original plan. The 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 various difficulties. The Government will closely monitor the progress of works and the construction situation as well as facilitate the MTRCL to early resolve the problems encountered in the construction works. The Government will also conduct timely reviews of the programme in accordance with the latest situation of the project.

**Transport and Housing Bureau
Highways Department
November 2014**

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.

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鐵路拓展處 RAILWAY DEVELOPMENT OFFICE



路政署
HIGHWAYS DEPARTMENT

圖例
LEGEND

- 現有鐵路路線
EXISTING RAIL LINE
- 南港島線（東段）
SOUTH ISLAND LINE (EAST)




附件二
ENCLOSURE 2



南港島線（東段）
SOUTH ISLAND LINE (SIL) (EAST)



圖例
LEGEND

-  現有鐵路路線
EXISTING RAIL LINE
-  觀塘線延線
KWUN TONG LINE EXTENSION
-  沙田至中環線
SHATIN TO CENTRAL LINK

觀塘線延線
KWUN TONG LINE EXTENSION

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

**Progress update of the Shatin to Central Link
(As of 30 September 2014)**

INTRODUCTION

At the Subcommittee meeting on 4 July 2014, Subcommittee members discussed the progress of the Shatin to Central Link (“SCL”) up to the end of May 2014. This report updates members on progress of SCL up to 30 September 2014.

OVERALL PROGRESS OF THE SCL PROJECT

Contracts awarded

2. For the SCL project, 21 major construction and 21 major electrical & mechanical (“E&M”) contracts¹, together with other minor contracts, have been awarded with a total award sum of \$43.832 billion. The contract sums for civil works and E&M works are about \$31.831 billion and \$12.001 billion respectively (Please refer to Annex I for details).

Overall progress of the project

3. As of 30 September 2014, the overall works for the SCL are 21% completed (Please refer to Annex II for details). The SCL comprises of six sections according to geographical locations:

(a) Shatin Section;

¹ Major construction 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.

- (b) Wong Tai Sin Section;
- (c) Kowloon City Section;
- (d) Hung Hom Section;
- (e) Cross Harbour Section; and
- (f) Hong Kong Island Section.

- (a) Shatin Section (Section of railway between Tai Wai Station and Ma Chai Hang in Wong Tai Sin)

4. The construction of Hin Keng Station and related tunnel connections are generally progressing on schedule. The foundation works for Hin Keng Station were completed in May 2014, whilst the progress of structural works for the station is satisfactory with on-going excavation for constructing pile caps and the drainage system. The underground utilities diversion for the elevated tracks are about to be completed, and will be followed by commencement of the viaduct foundation works soon after. The foundation works of the at-grade track structure are underway. The contractor is carrying out pipe piling works as well as building temporary work platforms. Excavation works for the railway section between the at-grade structure and Lion Rock are expected to begin at the end of this year.

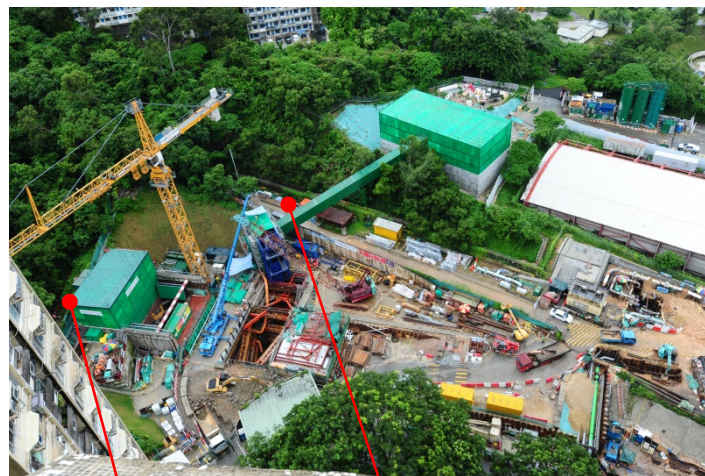


Hin Keng Station construction site

5. The railway tunnels between Hin Keng and Ma Chai Hang in Wong Tai Sin have been under construction using the drill and blast method² since July

² The drill and blast method is adopted for the construction of tunnels through rock stratum for the SCL project. The blasting procedure would include drilling holes into the rock, filling the blast holes with explosives, and detonating the explosives. Once blasting has been carried out, the spoil is removed from the tunnel and shotcrete is applied to support the tunnel structure. The drill and blast method is commonly used for rock strata excavation

2014. As mentioned in the paper submitted to the Subcommittee in July, the geological condition was found to be more complicated than expected. Additional temporary supports were required to stabilise the strata. As a result, the tunnel construction was behind schedule. As of the end of September, the drill and blast tunnelling works were two to three months behind schedule. The progress may be further affected given by the unforeseeable risks due to the geological condition and site constraint. In order to speed up the construction progress, a noise enclosure has been installed on top of the shaft, and related permits have been granted by relevant government departments for carrying out construction in the tunnel round-the-clock since early May. When blasting goes farther inside Lion Rock, a fault zone (mixed ground) may be encountered. To ensure blasting safety and stability, high-pressured grouting technology will be essential for strata consolidation, and to prevent the loss of underground water and soil. However, this process will inevitably further affect the construction programme. The Corporation is reviewing various progress recovery measures with a view to speeding up the construction process. To further reduce the noise and dust generated from the tunnel construction, the installation of an enclosed conveyor belt for the disposal of excavated materials is also in progress and is expected to be in operation in November.



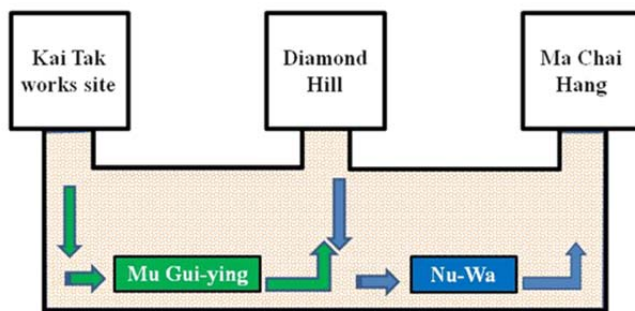
Noise enclosure

Enclosed conveyor belt

(b) Wong Tai Sin Section (Tunnel section between Ma Chai Hang and Kai Tak Station in Wong Tai Sin)

worldwide and in Hong Kong. Such method requires less works area and hence reduces the impact of construction works on the community.

6. The two tunnels from Diamond Hill to Ma Chai Hang and Kai Tak to Diamond Hill are being constructed by using tunnel boring machines (“TBM”). The two TBMs, namely “Nu-wa” and “Mu Gui-ying”, were assembled and launched in the former Tai Hom Village works site and Kai Ching Estate works site in August and September 2014 respectively. The former is constructing the 1,700 metre up-track tunnels from Diamond Hill towards Ma Chai Hang and the latter is constructing the 750 metre up-track tunnels from Kai Tak towards Diamond Hill. The construction of both tunnels is expected to be completed by the first half of 2015, followed by construction of the down-track tunnels.



7. Shaft excavation for the emergency access point at the junction of Wong Tai Sin Road and Sha Tin Pass Road commenced in early September 2014, and is expected to be completed by the fourth quarter of this year. The sheet piling works for the adjacent Public Transport Terminus that began in mid-June are also expected to be completed by the fourth quarter of this year, to be followed by the commencement of structural works.

8. Diaphragm wall construction for the extension of Diamond Hill Station was completed in early October. The progress was slower than the original plan as the rock layer that support the diaphragm wall underground was deeper than expected. This made us spend more time to complete the works. To avoid affecting the whole excavation programme, the Corporation has rendered assistance to the contractor to adjust the works procedures so as to commence the excavation works for the station structure before the completion of all diaphragm walls. The shaft excavation for retrieval of the TBM is expected to be completed by the first quarter of 2015. In addition, station modification works are underway in the existing Diamond Hill Station including the construction of new lifts and escalators, and the jack-arch wall strengthening works at the southern concourse to prepare for the construction of a pedestrian subway linking to the new part of Diamond Hill Station.



Diamond Hill Station Extension construction site

(c) Kowloon City Section (Tunnel section between Kai Tak Station and Ho Man Tin Station)

9. The structural works of Kai Tak Station commenced in the first quarter of 2014, and construction of the platform structure has been initially completed. Tunneling works between Kai Tak Station and To Kwa Wan Station are in progress and part of the tunnel structure has been completed.



Kai Tak Station construction site

10. Due to the expansion of the archaeological survey area at To Kwa Wan Station, some construction works had to be suspended and the construction progress of the launching shaft for tunnel boring works from To Kwa Wan Station to Ho Man Tin Station was affected. As announced earlier, construction of the Tai Wai to Hung Hom Section of SCL faces a cumulative delay of about 11 months, resulting from the impact of the archaeological survey at Phase II area on critical construction works for the tunnels and To Kwa Wan Station. In this connection, the contractor built a protection wall at Area T1 in July to protect the archaeological remains and to resume works in the launching shaft.

The excavation and strut installation works of the shaft are in progress and are expected to be completed early next year. Following that, the Corporation will carry out TBM assembling works (Details of the archaeological survey area are in Annex III).



To Kwa Wan Station construction site

11. The archaeological survey at Phase III Area commenced in April 2014 and was completed at the end of September. A stone well (J2) and a flume were discovered at Phase III Area located at the middle of the Station, while some building remains, stone building features and a stream from the Song-late Qing Dynasties were discovered in the locations of the north of the station, ventilation facilities and subway linking to entrance of Pak Tai Street. The archaeological specialist submitted an interim report to the Antiquities and Monuments Office (“AMO”) at the end of September. With the consent of the AMO, the construction works were gradually resumed in those areas where the archaeological survey was completed and the finds would not be affected by the construction works.

12. The Government is conducting a consultation with the Antiquities Advisory Board on the preservation scheme of the heritage remains. The impact on the overall railway project will be further assessed after the confirmation of the preservation scheme.

13. The archaeological survey has inevitably affected railway construction for the Kowloon City Section. The full extent of its impact on the construction, design, programme and cost will be determined after confirmation of the preservation scheme.

14. For Ma Tau Wai Station, the construction of the western side of diaphragm and cross walls is in progress and is expected to be completed in late 2014. Following that, roof slab construction works will be carried out. As

announced earlier, it is estimated that diaphragm wall construction is about five months behind schedule. The Corporation has requested the contractor to deploy more equipment and staff, as well as to rearrange works procedures for the diaphragm wall and station, in order to speed up progress. To ensure the structural safety of buildings nearby, since the commencement of diaphragm wall construction works at the west of Ma Tau Wai Road, continuous monitoring measures have been adopted, such as the 24-hour Automatic Vibration Monitoring System. Moreover, temporary traffic management schemes at Ma Tau Wai Road have been implemented for almost two years, and the traffic is generally smooth.



Ma Tau Wai Station construction site

15. To facilitate the future tunnel boring works from To Kwa Wan Station to Ma Tai Wai Station, underpinning and pile removal works for the East Kowloon Corridor are underway. Inevitably, the works would induce minor vibration. To minimise the impact of works, the Corporation has rearranged the works procedures and set up monitoring points at various locations nearby the site.

(d) Hung Hom Section (Tunnel section between Ho Man Tin Station and Hung Hom Station)

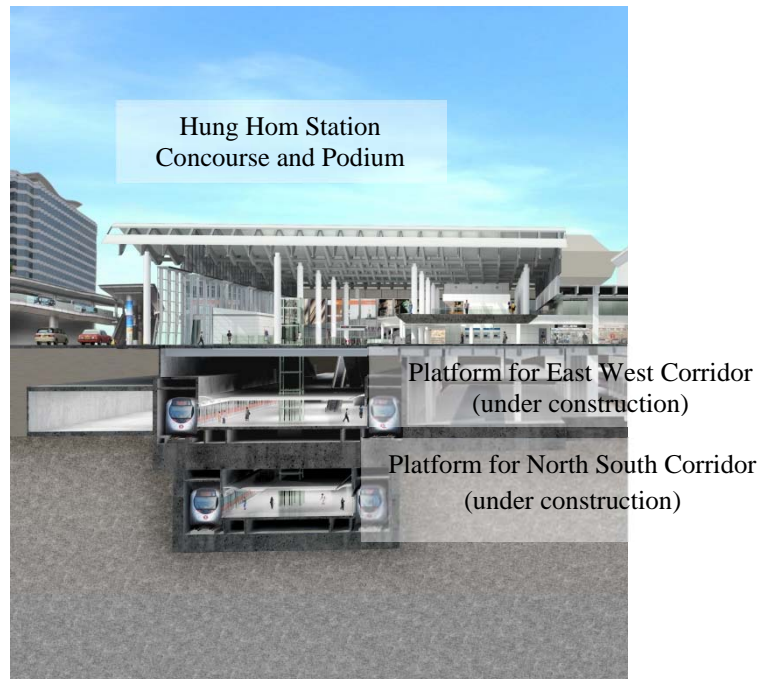
16. Two railway tunnels are being constructed at the north of Hung Hom Station under the SCL project, connecting the East Rail Line (“EAL”) and West Rail Line respectively. The construction team is carrying out piling works at Chatham Road North, Winslow Street and sites next to the EAL to prepare for tunnel excavation at a later stage. Construction works at works sites close to the EAL have to be carried out carefully in order to avoid interrupting the existing railway service and some works have to be carried out during non-traffic hours at night, which increase the difficulty of the works.



Piling works at the north of Hung Hom Station

17. Hung Hom Station will become an interchange station for the SCL's "East West Corridor" and "North South Corridor". Station concourse modification works have commenced in stages since September this year. The layout of station facilities will be revised upon completion. The concourse environment and station facilities will be upgraded for the new railway service. Upon completion of the SCL project, Hung Hom Station will have two levels of new platforms designated for "East West Corridor" and "North South Corridor" service.

18. The new platforms will be located under the Hung Hom Station podium. The construction of diaphragm wall and foundation of the new platforms commenced in mid-2013. Given the limited space at the underground of the Hung Hom Station and its vicinity, it is necessary to modify part of the foundation of the Hung Hom Station podium to make room for the construction of new platforms and tunnels. All works procedures under the Hung Hom station podium were closely related. Part of the works are required to be carried out in a prudent manner in view of the existing foundation and underground utilities. During the works period, the geological condition was also found to be more complicated than expected. This made the progress slower than the original plan. It is estimated that the modification works of Hung Hom Station are around three months behind schedule. The construction team is committed to monitor the progress of the modification works and implement every feasible measure to ensure safety of the station, structure of nearby buildings and the public. At the same time, the Corporation is working proactively with the contractor to rearrange works procedures of the modification works at Hung Hom Station to speed up the progress.



(e) Cross Harbour Section (Tunnel section across the Victoria Harbour)

19. The existing EAL will be extended from Hung Hom to the north of Hong Kong Island via the SCL through the fourth cross-harbour rail tunnel. The construction of the Cross Harbour Section is at the tendering stage with contract award and commencement of construction expected by the end of this year. The cross-harbour rail tunnel will be constructed by immersed tube tunnel. The Corporation commenced the site preparatory works in the ex-Shek O Quarry in mid-2014.

20. The works of the SCL Cross Harbour Section are extremely complicated and require coordination with other infrastructure works at Hong Kong Island North. To reduce the impact on the community and the infrastructure due to the works duplication, SCL entrusted the Central-Wan Chai Bypass (“CWB”) project to carry out protection works at Causeway Bay Typhoon Shelter (“CBTS”) and construct the overlapping tunnel section of SCL and CWB. The tunnel structure was completed in June 2014. In coordination with the CWB, the rest of the SCL railway tunnel construction is expected to gradually commence in CBTS and its vicinity in mid-2015.

21. Since the third quarter of 2014, the Corporation has commenced several advanced works in Victoria Harbour including geological investigation on the seabed, trial trench excavation and removal of hard material conflicting with the SCL alignment and these works are expected to be completed by the end of 2014.

(f) Hong Kong Island Section (Tunnel section on Hong Kong Island ending at Admiralty Station)

22. Advanced works for the Hong Kong Island Section including underpinning of foundations, box culvert diversion, and re-provisioning of Harbour Road Sports Centre and Wan Chai Swimming Pool have been in progress since 2013 and their progress is as expected. Temporary re-provisioning works for facilities of Wan Chai Sports Ground were completed in September this year. The existing facilities are being demolished to make space for the construction of facilities for Exhibition Station.



Re-provisioning of Wan Chai Swimming Pool

23. The contract for railway tunnel construction of the Hong Kong Island Section was awarded in August this year, and the major construction works will commence on Hong Kong Island gradually. Meanwhile, Exhibition Station construction is at the tendering stage and the contract will be awarded later.

24. Exhibition Station is located at Wan Chai North where traffic is busy. Part of the works site can only be handed over to SCL for station construction after completion of the reclamation for Wan Chai Development Phase II (“WDII”) and the tunnelling works for CWB under WDII, which further complicates the works sequence of station construction. Part of the newly reclaimed land will be handed over to SCL for the temporary re-provisioning works of the Public Transport Interchange at Wan Chai north, so as to vacate the area for the construction of Exhibition Station. However, the schedule for land possession from WDII is lagging behind schedule which affects the programme for temporary Public Transport Interchange construction works. Part of the construction works for the temporary Public Transport Interchange has commenced, advance works for temporary traffic management schemes will be implemented continually at Fleming Road, Harbour Road and Hung Hing

Road etc. It is estimated that the Interchange will be temporarily relocated to the new reclaimed area in the first half of 2015.

25. According to information from the Government, some of the critical areas at Expo Drive East / Convention Avenue would only be available and handed over to SCL six months later than the original schedule, while the last piece of works area would only be handed over in early 2017. Meanwhile, enabling works will be required for the future topside development on Exhibition Station. It is expected that the above factors may have impacts on the schedule of the SCL.

26. The Corporation is committed to maintaining close communication with Government departments regarding the progress of other infrastructure projects, land handover arrangements and construction sequence coordination such that the construction of the Exhibition Station could be carried out as planned.

IMPROVEMENT WORKS FOR THE OPERATING RAILWAY FACILITIES

27. Modification works including extension of platforms and roofs are being carried out at Ma On Shan Line (“MOL”) stations for the 8-car train operation of the East West Corridor. Works began in 2012 and are nearly 57% completed. The new Automatic Platform Gates (“APGs”) prototype was delivered to Hong Kong in October 2013 with strict reliability tests passed. The retrofitting works are expected to commence by November this year. The Corporation is committed to completing APGs installation in MOL stations in 2017, one year earlier than originally scheduled. Modification and extension works are being carried out at the existing Pat Heung Depot. Foundation works for the Maintenance Building extension have been completed, while the superstructure construction and the superstructure works of the Ancillary E&M Plant Building have commenced.

28. APGs retrofitting will also be carried out along the EAL. Before the commencement of APGs retrofitting works, platform strengthening, equipment rooms for relevant signalling system and facilities are all required. To avoid interrupting normal train service, the above works could only be carried out overnight after normal train service hours which means there is limited time available to carry out these very complicated works. Platform strengthening works at Racecourse Station have already been completed and platform modification works are in progress at other stations including Sheung Shui,

Fanling, Tai Wo, Tai Po Market, University, Fo Tan and Sha Tin. APGs retrofitting works for the whole EAL are expected to be completed by 2020.

PREPARATION AND CO-ORDINATION FOR CONSTRUCTION WORKS

29. In order to keep local communities and the general public informed of the progress of the SCL project and to listen to their views, an SCL Information Centre was set up in To Kwa Wan in October 2012. Over 700 enquiries have been handled. An Information Counter has also been set up at Hin Keng Shopping Centre since February 2014 for the convenience of local residents in Sha Tin District. Over 1,000 enquiries have been handled since it opened for service. To reach out to the travelling public along the MOL, four rounds of Information Zones on the platform modification works were carried out along MOL stations. Apart from displaying related project information, passengers could obtain information about the works from our engineers at the events.

30. Community Liaison Groups (“CLGs”) have been set up in the districts to be served by SCL as a channel to communicate with the local communities. At the regular CLG meetings, reports on project progress and possible impacts to the community are provided. A total of 42 meetings have been conducted so far. Members of the CLGs include local District Councillors, representatives of residents, schools, local organisations, etc., and representatives from government departments such as Highways Department, Hong Kong Police Force, Transport Department, Lands Department and Home Affairs Department.

31. Since most SCL works areas are close to residents and shops, Community Liaison Officers and the construction teams of the Corporation proactively visit shops and nearby residents to maintain close dialogue and to address any concerns they have in a timely manner.

EMPLOYMENT OPPORTUNITIES

32. As at August 2014, about 5,600 construction workers and technical/professional staff members are employed on the SCL project. It is estimated that the project manpower figure will be around 8,000 when reaching its peak in the third quarter of 2015.

CONCLUSION

33. The SCL is large scale project running through numerous developed areas in Hong Kong Island, Kowloon and New Territories. Construction works are in full swing and while good progress is being made in some works areas, unexpected challenges have also been encountered at other locations. Though most stages of the archaeological survey at the To Kwa Wan Station construction site was completed at the end of September, there remains at least an 11-month cumulative delay to the SCL programme as presented to the subcommittee and the public previously. The full extent of the impact to the programme, design, construction and cost will be determined after confirmation of the heritage preservation plan. It is expected that the archaeological works will result in additional expenditure for the project to a certain extent.

34. The Corporation will continue to strive to overcome the difficulties encountered by constantly reviewing the progress of the project and developing mitigation measures accordingly. Every effort continues to be made to co-ordinate with relevant authorities for the implementation of the project. Updated information of the project progress will be communicated to the public in a timely manner.

MTR Corporation Limited
November 2014

Expenditure report as of 30 September 2014

Table 1 – Situation of expenditure

	Awarded contract sum for the contracts (\$ million)	Cumulative expenditure (\$ million)	Estimated amount* of unresolved claim (\$ million)
Civil works	31,831	10,586**	236.2 (see Table 2)
E&M works	12,001	594**	0
Total	43,832	11,180	236.2

*Amount stated in the contractor's detailed claim report

**Amount by Government expenditure

Table 2 – Situation of substantiated claims

	Claims resolved			Claims unresolved		
	Number	Amount claimed originally* (\$ million)	Amount awarded (\$ million)	Number	Amount claimed* (\$ million)	Interim award (\$ million)
Civil works	10	20	13.9	115	236.2	8.7
E&M works	2	0	0	3	0	0
Total	12	20.0	13.9	118	236.2	8.7

*Amount stated in the contractor's detailed claim report

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

2. As at 30 September 2014, the Corporation received 130 substantiated claims and the amount claimed in total was about \$256.2 million, representing 0.6% of the awarded contract sum for the contracts. The Corporation has been discussing the details of the claims with the contractors concerned, and would thoroughly assess the amount claimed. The Corporation would process each claim in a prudent manner, and the contractors would have to provide sufficient justifications and information. As at 30 September 2014, 12 cases were resolved and about \$13.9 million was awarded, representing about 0.03% of the awarded contract sum for the contracts. The Corporation would continue to handle the cases cautiously.

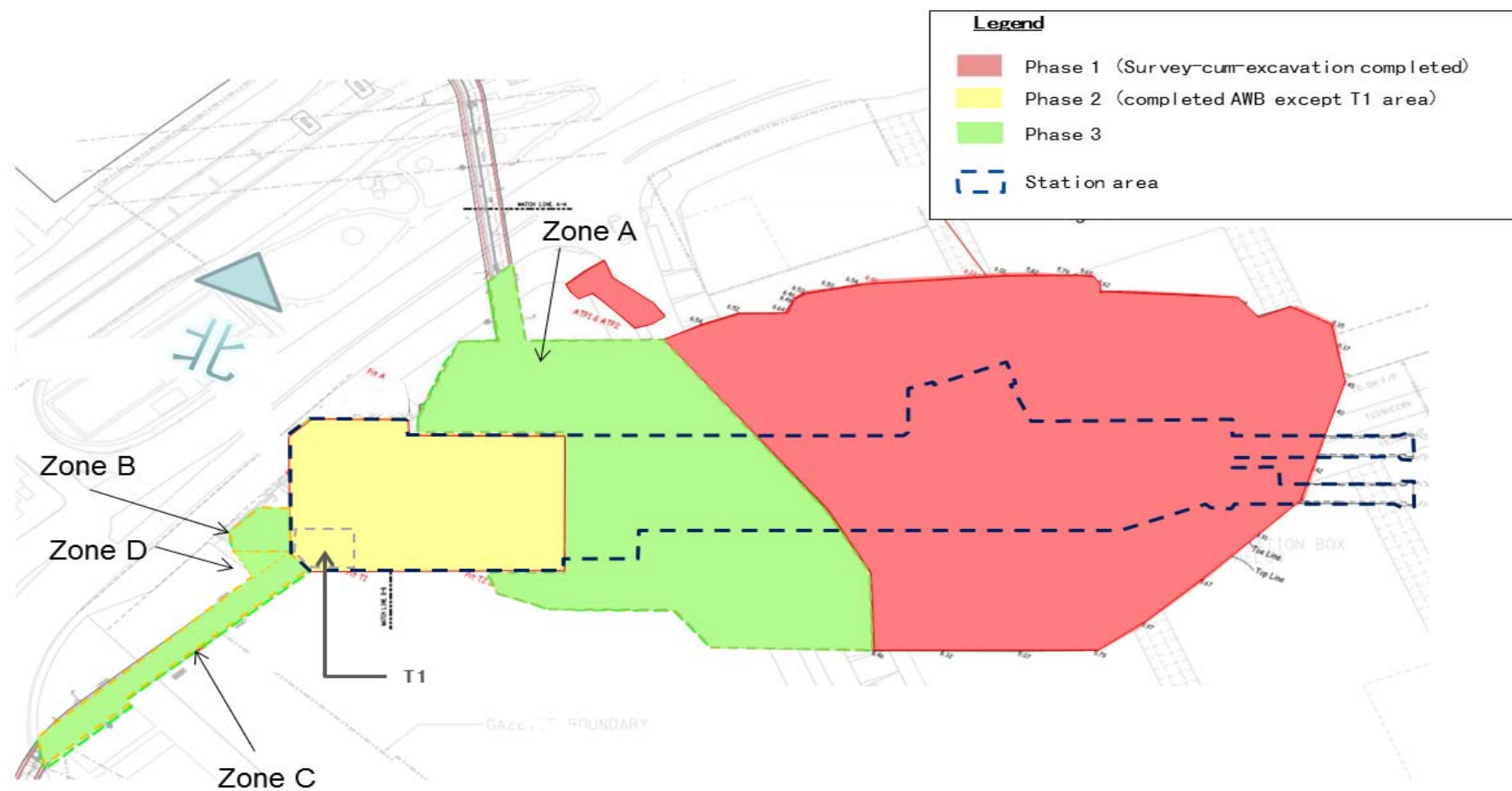
Overall works progress of the SCL as of end of September 2014

Overall works completed : 21%

Culminated progress of major civil contracts awarded :

Contract No.	Contract Name	Percentage completed
1101	Modification of Ma On Shan Line	57%
1102	Hin Keng Station and Approach Structures	23%
1103	Hin Keng to Diamond Hill tunnels and Fung Tak Public Transport Interchange	47%
1106	Diamond Hill Station Extension	43%
1107	Diamond Hill to Kai Tak Tunnels	60%
1108	Kai Tak Station and Associated Tunnels	35%
1109	Stations and Tunnels of Kowloon City Section	31%
1111	Hung Hom North Approach Tunnels	37%
1112	Hung Hom Station and Stabling Sidings	26%
1114	Pedestrian Links at Tsz Wan Shan	32%
11209	Platform Modification and Associated Works at East Rail Line	14%
1125	Police Sports and Recreation Club Enhancement Works	60%
1126	Reprovisioning of Harbour Road Sports Centre and Wan Chai Swimming Pool	24%
1128	South Ventilation Building to Admiralty Tunnels	<1%*
1129	SCL - Advance Works for NSL	48%

*Civil Contract 1128 was awarded on 18 August 2014



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

**Progress Update on South Island Line (East) and
Kwun Tong Line Extension
(Up to 30 September 2014)**

PURPOSE

This paper aims to update Members of the Subcommittee on Matters Relating to Railways on the progress of the South Island Line (East) (“SIL(E)”) and Kwun Tong Line Extension (“KTE”) projects up to end September 2014.

ABSTRACT

SOUTH ISLAND LINE (EAST)

Background

1. At the meeting on 17 June 2014, the Subcommittee discussed the progress of the construction works of the South Island Line (East) (“SIL(E)”) up to May 2014. In response to Members’ concerns over the works progress, the Corporation provides an update of the latest progress up to September 2014.
2. SIL(E) is a 7-kilometre, medium-capacity railway that connects the Southern District with the existing railway network in Hong Kong through tunnels and viaducts via stations at Ocean Park, Wong Chuk Hang, Lei Tung and South Horizons. A train stabling and maintenance depot is located in Wong Chuk Hang.
3. To enhance convenience for Southern District residents, the project also includes a number of community facilities in addition to the railway. A public transport interchange will be provided under Wong Chuk Hang Station. There will also be improvement to the existing pedestrian network in the vicinity of Ocean Park and Wong Chuk Hang stations including a covered footbridge

connecting Wong Chuk Hang Station with the adjacent industrial area, a covered footbridge crossing Ap Lei Chau Bridge Road to link the western part of Ap Lei Chau Estate to Yi Nam Road near the Precious Blood Primary School as well as a pedestrian link to the Aberdeen Channel Promenade.

4. Construction of SIL(E) commenced in 2011. Upon commissioning, it will provide convenient and fast railway service for about 350,000 residents in the Southern District. The journey time from Admiralty to Ocean Park Station will be reduced from the current 25 minutes by road to just 4 minutes. The train ride from Admiralty to South Horizons Station will take approximately 11 minutes. The frequency of train service will be about 3 minutes during peak periods.

Project Progress

5. Up to the end of September 2014, over 78% of the works for SIL(E) has been completed. Over 99% of the excavation works for Nam Fung Tunnel have been completed and the Ap Lei Chau Tunnel construction works are over 99% complete. Construction works for the Wong Chuk Hang viaduct/ noise barrier have been substantially completed.

6. While good progress has been achieved in the construction of the four new stations in the Southern District including Ocean Park, Wong Chuk Hang, Lei Tung and South Horizons Stations, this is not the case for the technically complex works at Admiralty Station, which have fallen further behind the original schedule as at the end of September. Currently, the target for opening of SIL(E) is at the end of 2016.

7. The MTR Corporation (“The Corporation”) has completed a review of the cost estimate for the project according to its revised works programme. The latest capital estimate of SIL(E) has been revised upward from HK\$12.4 billion (prices at 2009) to HK\$15.2 billion. As SIL(E) is an “ownership” project, MTR Corporation will bear the relevant additional cost in accordance with the “ownership” approach.

Track and Train-related Works

8. The Admiralty Station extensions works as part of the SIL(E) project includes the construction of platforms for SIL(E) and Shatin to Central Link (“SCL”) at Harcourt Garden as well as two overrun tunnels for SCL, each with an approximate length of 200 metres. Excavation for the SIL(E) platforms and tunnels has been completed and the excavation of the SCL tunnels is expected

to be completed in the second quarter of 2015. Meanwhile, cut-and-cover excavation continues for the station box of the Admiralty Station extension (details in paragraphs 12 and 13). Shaft blasting works at the Hong Kong Park Works Site have been completed and the construction of the ventilation building at Hong Kong Park is in progress.

9. Tunnel blasting works for the Nam Fung section have been substantially completed. Tunnel lining works and the construction of the transition structure that connects to the viaduct section are in progress. As geological challenges had to be overcome during the blasting works for Nam Fung Tunnel, the expected completion date of the Nam Fung Tunnel construction works will be slightly deferred from the first quarter of 2015 to the second quarter of 2015.



Nam Fung Tunnel permanent lining works

10. The installation of noise barriers and track-laying works for the viaduct section are substantially complete and installation of trackside auxiliaries is in progress. Trackwork inside the tunnel on Ap Lei Chau is also substantially complete. With the exception of Admiralty Station, all track-laying works are expected to be completed in the third quarter of 2015.



Track-laying works in the tunnel on Ap Lei Chau

11. All of the 10 new SIL(E) trains have been delivered to MTR Siu Ho Wan Depot. After undergoing a series of initial tests at Siu Ho Wan Depot, the train sets will then be transported to Wong Chuk Hang Depot at the end of this year for final testing and commissioning.

Station Structural Works

12. Admiralty Station is undergoing expansion to become an interchange station for four railway lines including the Island Line, Tsuen Wan Line, South Island Line (East) and SCL. There are three levels at the existing Admiralty Station including one concourse level and two platform levels serving passengers on the Tsuen Wan Line and Island Line. The Admiralty Station extension works are being carried out under Harcourt Garden, east of Admiralty Station, with three additional levels being constructed below the existing station. The extended station will include one mezzanine level and two platform levels with the SIL(E) platforms located at the lowest level. Cut-and-cover excavation and construction of the station structures are now progressing at the Harcourt Garden works site. Currently parts of the excavation have reached the foundation level of the extended Admiralty Station and construction of the station structure is in progress.

13. Underpinning of the existing Island Line tunnel is also in progress, which requires the installation of temporary steel beams and columns to support the existing Island Line structure while the in-situ rock is excavated incrementally from beneath the structure. These works are being carried out beneath the operating railway and great care is needed to maintain the safety of the railway tunnel structure and ensure that there is no impact to train services. The

excavation for the programme critical underpinning works has not achieved the planned production rate. This is due to the access constraints, tight working space, and at some locations geological features that have required more bolting and temporary support works. While overcoming these difficulties safety has been maintained as the top priority and strict engineering controls in accordance with international best practice have been applied. At some locations the planned production rate was achieved but this was not possible across all the areas. These factors have all contributed to a further delay for these critical works. Since this type of work has never been done before in Hong Kong it is not possible to exactly forecast what progress rates will be achieved. For this reason the updated SIL(E) programme can only be confirmed after the completion of the underpinning works. However, the excavation and blasting for the cavern and SIL(E) platform tunnels that make up the southern part of the Admiralty Station extension have been substantially completed with structural works in progress.



Island Line tunnel underpinning works at Admiralty Station

14. Due to the ongoing blockage of roads in the Admiralty area since late September, access for works vehicles in and out of the Harcourt Garden works site has been affected. While works are still continuing, plant and materials supplies to the site, as well as construction material removal from site, are affected as a result of traffic restrictions. The impact on progress of the road blockage in the Admiralty area has been limited so far; however, if the road blockage is prolonged there may be an increasing impact on the progress of the structural and tunnel excavation works at Admiralty Station. The Corporation and its contractors continue to closely monitor the progress of the Admiralty Station extension works.

15. Station construction works in the Wong Chuk Hang area have been progressing well. Structural works for Ocean Park Station and Wong Chuk Hang Station have been completed and fitting-out and E&M works are in

progress. Structural works for Wong Chuk Hang Depot have also been completed with the fitting-out works and E&M works also in progress.

16. For Lei Tung Station, construction of the station structure at the concourse level is in progress. Blasting works for Entrance B of Lei Tung Station and the associated pedestrian adit have been completed. At Entrance A of Lei Tung Station at Main Street, the station entrance and pedestrian adit construction is in progress and expected to be completed in the fourth quarter of 2014.



Structural works of Lei Tung Station Entrance A

17. At South Horizons Station, excavation works have been completed and construction of the station box and entrance structure under the temporary traffic deck is in progress. Superstructure construction for the footbridge connecting Ap Lei Chau Estate is in progress and expected to be completed by the end of 2014. Structural works of the End Plant Building at Yuk Kwai Shan and the ventilation building at Lee Wing Street are in progress.



Station structural works in progress under the temporary traffic deck at South Horizons

KWUN TONG LINE EXTENSION

Background

18. The KTE project is a 2.6-kilometre underground extension of the existing Kwun Tong Line from Yau Ma Tei to Whampoa, with an intermediate station at Ho Man Tin which will be an interchange station with the future Shatin to Central Link currently under construction. Construction of KTE project commenced in 2011.

19. To facilitate convenient access to railway service for local commuters, essential public infrastructure works are being constructed in addition to the railway. These include a walkway connection between Oi Man Estate, Ho Man Tin Estate and Ho Man Tin Station, a covered footbridge across Chatham Road North, and public transport facilities at Chung Hau Street.

20. KTE will serve the 146,000 people living in Whampoa and Ho Man Tin with convenient and efficient railway service. Travelling by road-based transport between Whampoa and Mong Kok currently takes about 25 minutes during peak hours. Travelling time could be greatly reduced to 5 minutes upon KTE commissioning.

Project Progress

21. As at the end of September 2014, over 65% of the project works have been completed. In mid-2014 the Corporation reported that the overall works programme was behind schedule and since then, the construction team has been taking every possible measure to recover the delay. Civil works has been progressing along with E&M equipment fabrication, building services and system modification works. Currently, the target for opening of KTE is mid-2016.

22. The project cost estimate for the Kwun Tong Line Extension is currently maintained at the original \$5.3 billion (in 2009 prices) according to the Corporation's latest cost review.

Railway Tunnelling Works

23. The structural works of the railway tunnel were 65% complete as at end



September 2014. Track-laying works have commenced from Yau Ma Tei Station and are approaching the Wylie Road Ancillary Building.

Track-laying works are underway in the Yau Ma Tei Section

24. Structural works of the railway tunnel, including the tunnel walls, are now in progress in the section between Wylie Road Ancillary Building and Ho Man Tin Station. Tunnel lining works are being extended from Ho Man Tin towards Whampoa beneath Wuhu Street.

25. The planning and sequence of civil, track and E&M fabrication works are being re-arranged so as to expedite the progress of trackside installations. It is expected that the trackwork and trackside installations will be substantially completed in the second quarter of 2015.

Ho Man Tin Station and Essential Public Infrastructure Works

26. Ho Man Tin Station will serve as the future interchange station between the Kwun Tong Line and the Shatin to Central Link. Station structural works commenced in the fourth quarter of 2013 and are now 45% completed. Works have progressed to the plant room above the Shatin to Central Link platform level, and some of the fitting out works for the station are also underway. The structural works are expected to be completed in the first half of 2015 and would be followed by E&M installation and fitting out works.



Structural works of Ho Man Tin Station

27. The pedestrian linkage system for Ho Man Tin Station is 65% completed. The connection between Oi Man Estate and Sheung Lok Street as well as the covered footbridge to Wuhu Street are scheduled for completion in mid-2015. The facilities will open for public use after relevant inspections and examinations and upon receipt of approval from relevant government departments. Meanwhile, the subway and lift at Fat Kwong Street and Chung Hau Street will be available for public use when Ho Man Tin Station is opened.

28. The public transport facilities at Ho Man Tin Station are located on a slope next to Chung Hau Street. Extensive slope protection works and utility diversion were required to facilitate the sub-structure works. The majority of the foundation piles have been completed and construction works are progressing to the deck structure. The facilities are expected to be open for public use when Ho Man Tin Station is opened.

Whampoa Station and tunnelling works

29. Excavation of the East and West concourses of Whampoa Station is in full swing and is expected to be completed in early-2015; current completion rates are 77% and 81% respectively. To expedite progress, more manpower is being used at various work fronts and new heavy equipment has been deployed to enhance excavation efficiency.



Excavation of the East and West Concourses of Whampoa Station

30. The excavation of the platform tunnel between the East and West concourses is the most crucial part of the project at this point in time. Mixed ground conditions and groundwater will make the excavation work more difficult. More time is required to switch between different excavation methods and undertake necessary supporting works to ensure safety before commencement of the excavation work. As a result, the commencement of excavation for the platform tunnel will start in mid-November instead of the third Quarter of 2014 as previously planned. The construction team is planning detailed arrangements to mitigate delays, such as excavation from both ends of the tunnel. An application for an extension of the construction noise permit will be made to the Environmental Protection Department for works with the least noise impact, such as internal support of tunnels, to be carried out at night time. Mitigation measures will also be implemented to minimise any impacts to the adjacent residents. The excavation of the platform tunnel is expected to be completed in the second quarter of 2015.

31. In addition to the enhancement of manpower and introduction of heavy equipment, pre-fabricated components are also being used for the internal structures of Whampoa Station as a measure to save time for formworks and steel fixing on site. The E&M installation and fitting out works for the station will commence in early 2015.

SUMMARY AND WAY FORWARD

32. As pointed out in the report to the Subcommittee in June 2014, due to the complexity of the works at Admiralty Station, the SIL(E) project was at the time experiencing about six months of delay and the railway would not be opened in 2015 as originally planned. During the course of the underpinning works under the operating railway, great care is taken to ensure that railway passengers and members of the public in the nearby buildings are not affected. Currently, the

excavation progress is far from satisfactory and has resulted in a further delay in the underpinning works. Further impact on the works progress at Admiralty Station is expected. Whilst the SIL(E) project is targeted for opening at the end of 2016, the Corporation would have more certainty on the opening arrangement upon further progress in the excavation and underpinning works at Admiralty Station.

33. For KTE, the construction of Whampoa Station remains very challenging as it is located in a densely populated area with busy traffic and complex underground utilities. To minimise impacts on residents and traffic as well as overcome construction challenges, the works arrangements and Temporary Traffic Management Scheme (“TTMS”) need to be continually adjusted. According to the latest works progress, the expected opening date for KTE is mid-2016. The Corporation will provide updates about the opening arrangements in due course.

34. Our construction teams will continue to implement the railway projects with safety as the priority, and strive to complete the SIL(E) and KTE projects and deliver the railway services as soon as possible. The Corporation will also continue to provide updates to the Subcommittee and the public on the latest construction progress.

MTR Corporation Limited
November 2014

For discussion on
25 November 2014

Legislative Council Panel on Development

Archaeological features discovered at To Kwa Wan Station of the Shatin to Central Link and their proposed preliminary conservation and interpretation plans

Introduction

This paper reports to members the archaeological features discovered at the To Kwa Wan Station of the Shatin to Central Link (SCL), their proposed preliminary conservation and interpretation plans, modification of the associated station design and construction method, as well as the impact on the programme and cost of the SCL project.

Background

2. The SCL, with a total length of 17 kilometres (km), 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. The SCL will have ten stations. Apart from improvements to the existing Tai Wai Station, the SCL project will involve the 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 (Exhibition) and Admiralty. It is a territory-wide strategic railway project (alignment

layout at **Enclosure 1**).

4. The estimated construction cost for the entire SCL project is about \$79,800 million¹ (in the money-of-the-day prices). Being implemented under the “concession approach”, the Government is responsible for funding the construction of the SCL. 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 MTR Corporation Limited (MTRCL) entered into an agreement for entrusting construction, testing and commissioning of the SCL to the latter. The MTRCL has been entrusted to provide management and monitoring service to the SCL project. The main construction works commenced in July 2012. According to the agreement, the target commissioning dates are December 2018 for the Tai Wai to Hung Hom section of the SCL and December 2020 for the Hung Hom to Admiralty section.

Archaeological Work and Discovery

5. In conducting the environmental impact assessment (EIA) under the Environmental Impact Assessment Ordinance, the consultant appointed by the MTRCL has assessed the impact on cultural heritage arising from the SCL railway scheme, including the possible existence of archaeological finds at the previous location of the Sacred Hill and its vicinity within the area of the To Kwa Wan Station. Therefore, the EIA report for the SCL recommended that an archaeological survey-cum-excavation² be carried out at a specified area prior to the

¹ The total estimated construction cost includes the construction cost estimate of protection works under **58TR** and **59TR**, advance works under **63TR** and **64TR**, construction of railway works-main works under **61TR** and construction of non-railway works – main works under **62TR**.

² Archaeological survey-cum-excavation is commonly conducted before construction within a specified area with archaeological potential. The archaeological survey is to define the precise horizontal extent and the nature of the archaeological deposits while the excavation is applied to this confined area to retrieve the archaeological data completely. The archaeologist needs to submit a proposal of the archaeological work to the Antiquities and Monuments Office (AMO), including the method and the procedure

commencement of construction works for the To Kwa Wan Station. After consultation with the Advisory Council on the Environment and making available the EIA Report for public inspection and comment, the EIA Report for the SCL was approved by the Director of Environmental Protection in February 2012.

6. An archaeological survey-cum-excavation was carried out at the specified area before commencing construction of the To Kwa Wan Station. The archaeological work was carried out by an independent archaeological team engaged by the SCL contractor. Under the close supervision of the Antiquities and Monuments Office (AMO), fieldworks commenced in November 2012 at the Part 1 archaeological area in accordance with the Antiquities and Monument Ordinance (see Part 1 archaeological area **in Enclosure 2** which is provided by the MTRCL). A square-shaped stone well dated to the Song-Yuan period with high heritage value was discovered in this archaeological area. The Government has revised the alignment of the proposed carriageway of Road L9 of the Stage 5 Infrastructure Works in the Kai Tak Development Area, so as to divert the carriageway away from the location of the well to facilitate its preservation and future public display. Since the square-shaped stone well remains intact and can reflect the lifestyle of the ancient settlement, it was decided after consulting the Antiquities Advisory Board (AAB) that the stone well should be preserved in-situ. As the well is located outside the To Kwa Wan Station area, its preservation will not affect the construction works of the station. Other key findings include ceramic sherds, coins and remnants of archaeological features of the Song-Yuan period as well as from recent epochs. These archaeological finds have been retrieved after taking records to facilitate further excavation to deeper levels reaching the sterile layer in search of other cultural relics. The excavation in this area has reached the sterile layer, which is 2.3 to 4.8 metres below ground level. The archaeological fieldwork was completed in December 2013.

of the archaeological excavation. With the approval of the AMO and support of the Antiquities Advisory Board (AAB), the Antiquities Authority (i.e. the Secretary for Development) will issue a licence to the applicant in carrying out the archaeological work in accordance with the proposal of the archaeological work and under the close monitoring of the AMO.

7. In relation to the above archaeological survey-cum-excavation, the independent archaeological team has submitted an interim report to the AMO. During the archaeological work, the AAB had been kept informed of the progress by the reports from the AMO. All the related documents were uploaded to the website of the AMO for public viewing. The SCL contractor has resumed construction works by phases within the Part 1 archaeological area since January 2013 upon the completion of the archaeological survey-cum-excavation.

8. On the other hand, over 500 coins mainly dated to the Song dynasty were found while piling works was carried out at the launching shaft location for tunnel boring machines (see Part 2 archaeological area in **Enclosure 2**). The discovery was immediately reported to the AMO by the MTRCL. Upon request and under the close supervision of the AMO, and after obtaining a licence issued by the Antiquities Authority (i.e. Secretary for Development) under the Antiquities and Monuments Ordinance, the independent archaeological team conducted an Archaeological Watching Brief (AWB)³ at the launching shaft area (designated as the Part 2 archaeological area) in December 2013. Archaeological fieldwork in the Part 2 archaeological area has been completed, except for the T1 Area which is of about 400 square metres at the south-western corner of the archaeological area. Excavation in the rest of the Part 2 archaeological area has reached the sterile layer, which is 2.6 to 4.5 metres below ground level. With the agreement of the AMO, construction works in this area (except T1 Area) have been progressively resumed since January 2014.

9. Another square-shaped stone well of the Song-Yuan period and stone building remnants were discovered at the T1 Area. At this stage, the MTRCL has implemented appropriate measures for the protection of the stone well in the T1 area and other stone building remnants.

³ Archaeological watch brief (AWB) refers to any archaeological work conducted during the construction phase of a development project. The AWB allows archaeological methods to be applied by archaeologists once any archaeological remains are identified in the course of the construction works of the development project. A proposal is required to specify the aim, method, and potential mitigation measures for the AWB. The AWB could turn into an archaeological excavation if significant archaeological remains are discovered. Once the AWB commences, the archaeologist needs to report any archaeological remains discovered to the AMO. The AMO will then report the related discoveries to the AAB. The AMO will also regularly oversee the related archaeological work.

10. Except for the T1 Area of the Part 2 archaeological area, the archaeological work has been extended to the Part 3 archaeological area upon the request of the AMO (see **Enclosure 2**). Under the close supervision of the AMO, and after obtaining a licence issued by the Antiquities Authority under the Antiquities and Monuments Ordinance, the independent archaeological team commenced archaeological work in April 2014 in areas within the Part 3 archaeological area. The MTRCL suspended construction in this archaeological area in order not to affect the archaeological work.

11. Archaeological fieldwork in the Part 3 archaeological area was completed in end September 2014. In this archaeological area, the extent of the former Sacred Hill was revealed and remnants and ceramic sherds dated from Song-Yuan, late Qing to Republican periods and the 1920s to 1960s were discovered in the vicinity. Archaeological discoveries dated to Song-Yuan period include remnants of building foundations, low walls, column plinths, stone wells, drains, a pit with a wooden structure found inside, and a stone footpath, etc. Features dated to late Qing to Republican period such as a stone well and a stone structure which form the riverbank of the former Ma Tau Chung were also found. Other findings include a water channel and a red brick well dated to the 20th Century, and a nullah built during the Japanese occupation.

12. The remains of a stone well and a water channel were discovered in mid-June 2014 in Zone A of the Part 3 archaeological area (see **Enclosure 2** for its location). The independent archaeological team conducted further excavation to investigate their dating, function and structure. Findings indicated that the stone well (Well J2) was built in the Song-Yuan period while the water channel was built in the early 20th century. The top portion of the stone well to which the water channel is connected was truncated by the water channel connection works in the early 20th century.

Preliminary Conservation Proposal for Archaeological Discovery

13. Having considered the expert advices from the independent archaeological team and the AMO, the Government concurred that the archaeological discoveries in the Part 2 and Part 3 archaeological areas have significant historical and heritage values. Due to the rarity of some of the archaeological features dating back to the Song-Yuan period, the archaeological discovery is an important one in Hong Kong in recent years. As these unearthed features have important research and educational values in helping us to understand the social development of Hong Kong in the Song-Yuan period, in-situ preservation where appropriate could be considered. Other organic relics which require specialist conservation treatment have been retrieved and moved off site. Details are at Table 1 and Enclosure 3.

Table 1

	Archaeological Feature	Location	Period	Conservation Proposal
1)	Well J5	Part 1 archaeological area	Song-Yuan	Preserve in-situ
2)	Stone building features	Part 3 archaeological area, Zone A	Song-Yuan	Preserve in-situ
3)	Wooden structure in a pit	Part 3 archaeological area, Zone A	Song-Yuan	Organic relic. Retrieved off site for conservation treatment
4)	Well J2 and water channel	Part 3 archaeological area, Zone A	Song-Yuan (Well) and Early 20 th century (water channel)	Four conservation options (pending decision)
5)	Well J1	Part 2 archaeological area, T1 Area	Song-Yuan	Preserve in-situ
6)	Building remains	Part 2 archaeological area, T1 Area	Song-Yuan	Preserve in-situ
7)	Stone footpath and stone	Part 3 archaeological area,	Song-Yuan (stone footpath)	Preserve in-situ

	Archaeological Feature	Location	Period	Conservation Proposal
	structure which form the riverbank of the former Ma Tau Chung	northern portion of Zone C	and late Qing to Republican period (stone structure)	
8)	Stone structure	Part 3 archaeological area, southern portion of Zone C	Song-Yuan	Two conservation options (pending decision)
9)	Stone building features and Well J3	Part 3 archaeological area, Zone D	Song-Yuan (stone building features) and late Qing (Well J3)	Preserve in-situ
10)	Stone building features	Part 3 archaeological area, Zone B and northern end of Zone C	Song-Yuan	Preserve in-situ
11)	Red brick well	Part 3 archaeological area, Zone A	Modern	Preserved by record

Four conservation options for the Well J2 and the associated water channel at Zone A of Part 3 Archaeological Area

14. As Well J2 and the remains of the early 20th century water channel discovered within Zone A of the Part 3 archaeological area are located at the centre of the footprint of the To Kwa Wan Station; and in particular the wall of Well J2 is located at the roof slab of the future station concourse, the station design and the construction works of the station would need to be adapted to tie in with the conservation plan for Well J2 and the water channel. In this regard, 3-dimensional laser scanning would be conducted by the engineering team for precise recording of the conditions of Well J2 and the water channel. As regards the conservation of Well J2 and the water channel, the MTRCL proposed the following four conservation options (**Table 2**). A detailed

comparison of the options is at **Enclosure 4**.

Table 2

Conservation Proposal	Content
Option 1	<p>First conduct detailed recording, then dismantle Well J2 and the water channel by hand and move it off-site for proper storage. After completion of construction works, reinstate them at the original position (but at a higher elevation near ground level) or at other suitable locations nearby to facilitate future public appreciation.</p>
Option 2	<p>First conduct detailed recording, then construct a giant “steel structure” to protect and accommodate Well J2 to facilitate removal and proper off-site storage. After completion of the construction works, the well will be reinstated at its original position (but at a higher elevation) or other suitable locations nearby to facilitate future public appreciation.</p> <p>Since the water channel dated to early 20th century is of lower heritage value, it will be removed off site for proper storage after detailed recording, and to be reinstated next to Well J2 in future.</p>
Option 3	<p>Preserve both Well J2 and the water channel in-situ. Construct a giant “steel structure” bigger than that of Option 2 to protect the whole of Well J2 and water channel. The giant structure together with its concrete cover will become a giant column, and will stay in the station concourse permanently.</p>
Option 4	<p>Preserve Well J2. Construct a giant “steel structure” to protect Well J2, the giant structure together with its concrete cover will become a giant column, and will stay in the station concourse permanently. For the water channel, it will be properly recorded. It will then be removed by hand and stored properly. After completion of works, it will be reinstated at its original location.</p>

15. In fact, two other similar square-shaped wells (i.e. Well J1 and Well J5), which are dated to the Song-Yuan period and of higher heritage value, have been preserved in-situ. Taking into account that Well J2 has been distributed in the early 20th century, its integrity and heritage value are relatively lower. In this connection, in-situ preservation or other conservation options can be considered with reference to overseas experience. When implementing the conservation plan, the archaeological team and experts from the AMO will closely monitor the implementation of the conservation work.

16. Regarding the impact on the construction progress of the SCL, the conservation method of Option 1 is relatively simple, and should have less impact on the construction programme and cost. For Options 2 to 4, a “steel structure” will need to be constructed to protect the feature. The construction of the “steel structure” involves piling works. If complex geological environment is involved, it will bring about additional construction time and cost. In respect of the station design, Options 1 and 2 would not require further changes to the station design. For Options 3 and 4, a “steel structure” together with a concrete cover would need to be constructed, and this would result in a large column sitting in the main passageway of the station concourse. The station design would need to be modified and the station concourse would need to be enlarged so as to allow passenger flow.

Two conservation options for the stone building features at the South of Zone C of Part 3 Archaeological Area

17. The independent archaeological team has identified some stone structures of the Song-Yuan Period (i.e. items 7, 8 and 10 in Table 1) at the northern and southern ends in Adit C in the Part 3 archaeological area (adit to Pak Tai Street) which will affect the alignment of the adit leading to Pak Tai Street (See **Enclosure 5**). It is proposed that the archaeological features in the northern end of Adit C should be preserved in-situ (see Table 1). With regard to the archaeological features in the southern end, the MTRCL proposed two conservation options: (1) preservation in-situ; and (2) preservation by record. A comparison of the two options is at **Enclosure 6**.

18. If Option 1 is adopted, the entire alignment of the adit connecting the T1 Area and Pak Tai Street will be seriously affected. Since the area around the adit is designated as a temporary works site to tie in with the construction of the station and the train tunnel, suitable alternative routing cannot be explored until the respective works are completed in the second half of 2017 when the area can be made available for further investigation. In other words, a temporary access at grade would be required to connect the station entrance upon completion of station construction works. In case no suitable alternative routing 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 (see **Enclosure 5**) at Ma Tau Chung Road to gain access to To Kwa Wan Station. The MTRCL will also explore the feasibility of adding a crossing at grade to Song Wong Toi Road at suitable locations in order to reduce the walking distance between Pak Tai Street and the station entrance.

19. If Option 2 is adopted to preserve the archaeological features at the southern portion of Zone C by recording, it would still be necessary for the MTRCL to identify an alternative routing for the section connecting the southern portion of Zone C and the station because the archaeological features found in the northern part would be preserved in-situ. As mentioned in Paragraph 18 above, suitable alternative routing cannot be explored until the respective works are completed in the second half of 2017. If no routing could be identified, this section of the adit would need to be replaced by passageway at grade, i.e., to connect the station entrance with access at grade. The crossing to Song Wong Toi Road connecting Pak Tai Street and the southern portion of Zone C would not be affected. Access to the station from Pak Tai Street is possible via the Kai Tak Development Area.

Conceptual Interpretation Plan of Archaeological Discovery

20. The Administration and MTRCL have proposed the preliminary conservation proposals and interpretation concept plan, and revised the

station design of To Kwa Wan Station to facilitate the preservation of the features unearthed for future public display. The area to the west of To Kwa Wan Station has been earmarked as the future Sung Wong Toi Park. The Administration will explore feasibility of providing appropriate facilities inside the park for displaying the archaeological features. Also, MTRCL will consider displaying part of the relics, such as pottery pots, bowls, incense burners, coins and roof tiles, etc in the concourse of the future To Kwa Wan Station.

Impact on the SCL arising from Archaeological Work and Discovery

21. The Transport and Housing Bureau has all along been concerned about the archaeological discovery and is fully co-operative on the construction arrangements. The MTRCL has made the following adjustments to facilitate the archaeological work:

- a) Expanding the archaeological work from Part 1 archaeological area to the entire works site of To Kwa Wan Station and engaging an independent archaeological expert team appointed by the contractor to conduct additional archaeological work to unearth more archaeological features;
- b) Suspending part of the excavation of the launching shaft of tunnel boring machine (TBM) and the station construction in the course of additional archaeological work. As a result, some labour, machinery and equipment of the contractor have to be left idle. Besides, the extended construction period will lead to an increase in the construction cost;
- c) Building temporary protection walls and carrying out protective backfilling works for the unearthed features in T1 Area of Part 2 archaeological area; and
- d) Modifying the design of the temporary supporting struts and the construction sequence for the TBM launching shaft.

22. The archaeological work, unearthed finds and conservation options have inevitably caused works delay and additional cost. The Highways Department has been working with MTRCL to examine

adjustments of the construction sequence, modify the original construction method and devise a suitable revised scheme for station design with a view to preserving the relics and minimising the impact on the works. According to the conservation options in Table 1 and the proposed conceptual interpretation plans mentioned in paragraph 20 above, the design and construction of To Kwa Wan Station will be affected as follows:

- (a) Revising the design of the ventilation facilities and plant rooms in T1 Area of Part 2 archaeological area and Zone B of Part 3 archaeological area, including their relocation, in order to preserve Well J1 and the nearby stone building features in-situ (**Enclosure 7**);
- (b) Erecting additional steel pipe pile protection walls to separate the stone building features of the Sung-Yuan Period in Zone A of Part 3 archaeological area outside the northern side of the station for protecting them from the effect of construction works (**Enclosure 7**);
- (c) Placing display cabinets at station concourse to showcase part of the relics unearthed (**Enclosure 7**);
- (d) Modifying the construction sequence, installing additional temporary supports and monitoring device at some locations inside the station footprint and repeating some works procedures as necessary;
- (e) Addressing the impacts arising from the preservation of Well J2 and the water channel (see paragraphs 14 to 16); and
- (f) Modifying the adit connecting Pak Tai Street and the station (see paragraphs 17 to 19).

23. Up to end-November 2014, the delay and additional cost caused by the archaeological work are tabulated as follows:

Table 3

Item	Adjustments made to the SCL because of the expansion of the extent of archaeological work	Delay to works of Tai Wai to Hung Hom section of SCL	Additional cost to SCL works@
1	Unavoidable adjustments to the SCL works for facilitating the	At least 11 months	About \$3.1 billion

Item	Adjustments made to the SCL because of the expansion of the extent of archaeological work	Delay to works of Tai Wai to Hung Hom section of SCL	Additional cost to SCL works@
	expanded archaeological work between December 2013 and end-September 2014 (see items (a) to (d) of paragraph 21 for details)		
2	Adjustments to the SCL works for adopting the proposed conservation options under Items 2 to 3, 5 to 7 and 9 to 11 of Table 1 (not including Well J2 and the water channel, and the stone structure at the southern end of Adit C) (see items (a) to (d) of paragraph 22 for details)	Will delay the construction period of To Kwa Wan Station but no further additional delay to the SCL project	About \$1 billion
3	Adjustments to the SCL works for adopting 4 conservation options for Well J2 and the water channel (see Table 2 and Enclosure 4)		
	Option 1:	<ul style="list-style-type: none"> • No further additional delay 	<ul style="list-style-type: none"> • About \$10 million
	Option 2:	<ul style="list-style-type: none"> • At least 4 months' additional delay 	<ul style="list-style-type: none"> • About \$0.8 billion
	Option 3:		<ul style="list-style-type: none"> • About \$1.3 billion
	Option 4:		<ul style="list-style-type: none"> • About \$1.2 billion
	Cumulative impact on the works from Items 1 to 3 above:	<ul style="list-style-type: none"> • At least 11 months (Option 1) 	<ul style="list-style-type: none"> • About \$4.1 billion

Item	Adjustments made to the SCL because of the expansion of the extent of archaeological work	Delay to works of Tai Wai to Hung Hom section of SCL	Additional cost to SCL works@
		<ul style="list-style-type: none"> At least 15 months (Options 2 to 4) 	(Option 1) <ul style="list-style-type: none"> About \$4.9 to \$5.4 billion (Options 2 to 4)
4	Conservation options for stone structure at the southern end of Adit C <ul style="list-style-type: none"> Given that the alternative tunnel alignment is yet to be confirmed as stated in paragraphs 17-19 above, assessments on the corresponding adjustment on works cannot be made at this stage 	Will only affect the construction of Adit C and no impact on the completion date of the To Kwa Wan Station	Assessments cannot be made at this stage

@ It does not include the cost required for future display of relics.

24. If the conservation option for Well J2 and water channel cannot be finalised by early December 2014, it is estimated that the construction cost will be increased by about \$250 million for each month of delay in making the decision. The works will be affected by the corresponding delay.

25. As the additional cost (**Table 3**) induced by the expanded archaeological work and discovery has not been included in the project contingency and the existing project contingency will not be sufficient to meet the additional cost, a funding application shall be submitted to the Legislative Council in a timely manner to ensure continual implementation of the project.

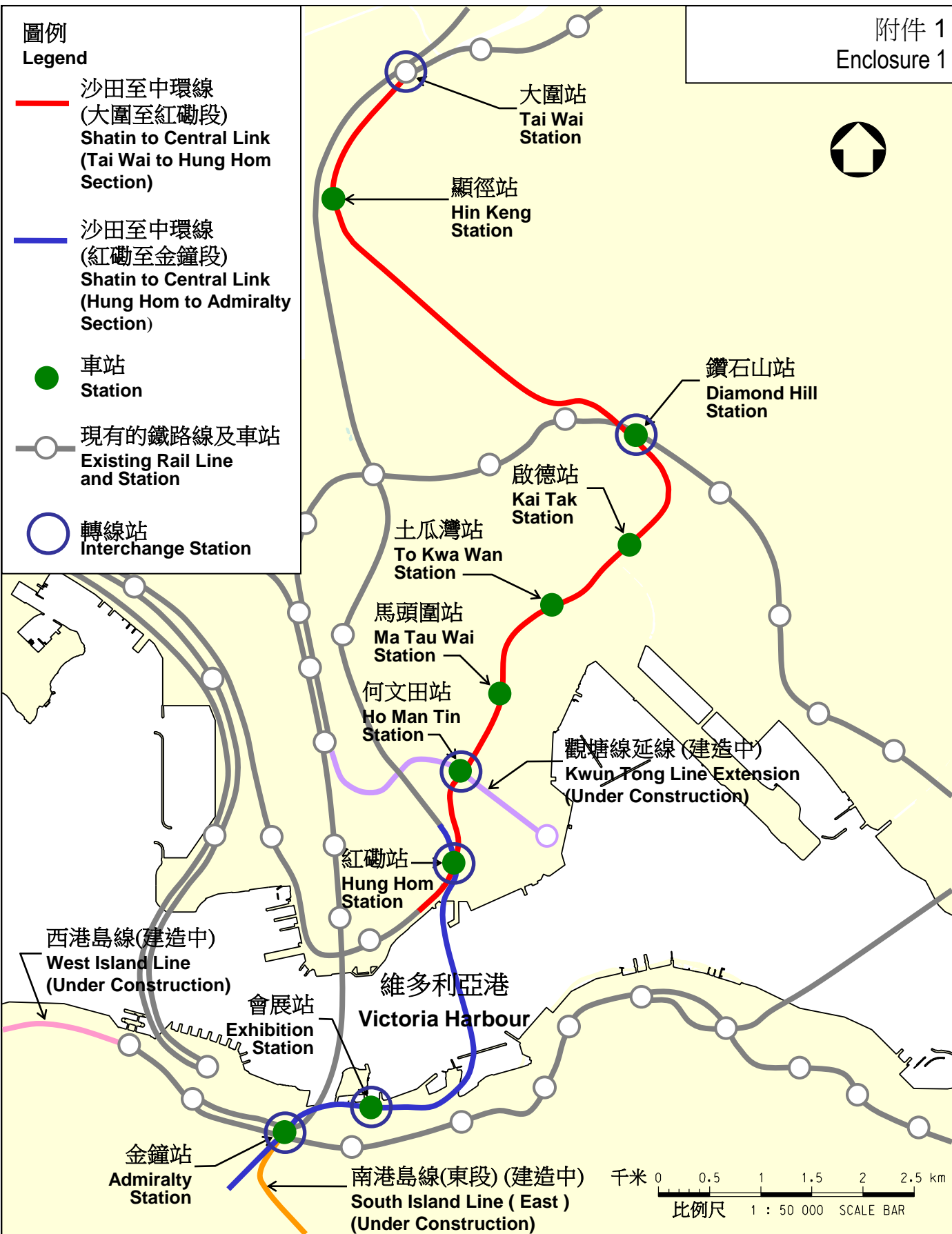
Conclusion

26. The Administration is extremely concerned about the archaeological discovery at the works site of To Kwa Wan Station, and places great importance on the discovery. As such, the archaeological survey area has been extended and the archaeological expert team has carried out additional archaeological work under the close supervision of the AMO. The AMO has also been reporting to the AAB about the archaeological finds in a timely manner. Our full cooperation with the archaeological work has inevitably caused delays of different extents to every aspect of the SCL works and induced additional cost. The archaeological work was completed in end-September this year. The Administration is consulting the AAB on the proposed conservation options for the archaeological discoveries. We hope that the conservation plan can be confirmed as soon as possible to facilitate conservation of the archaeological discoveries and the continual implementation of the SCL works without giving rise to further delays and additional costs.

Development Bureau
Transport and Housing Bureau
November 2014

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.

HRWSC003-SK0427

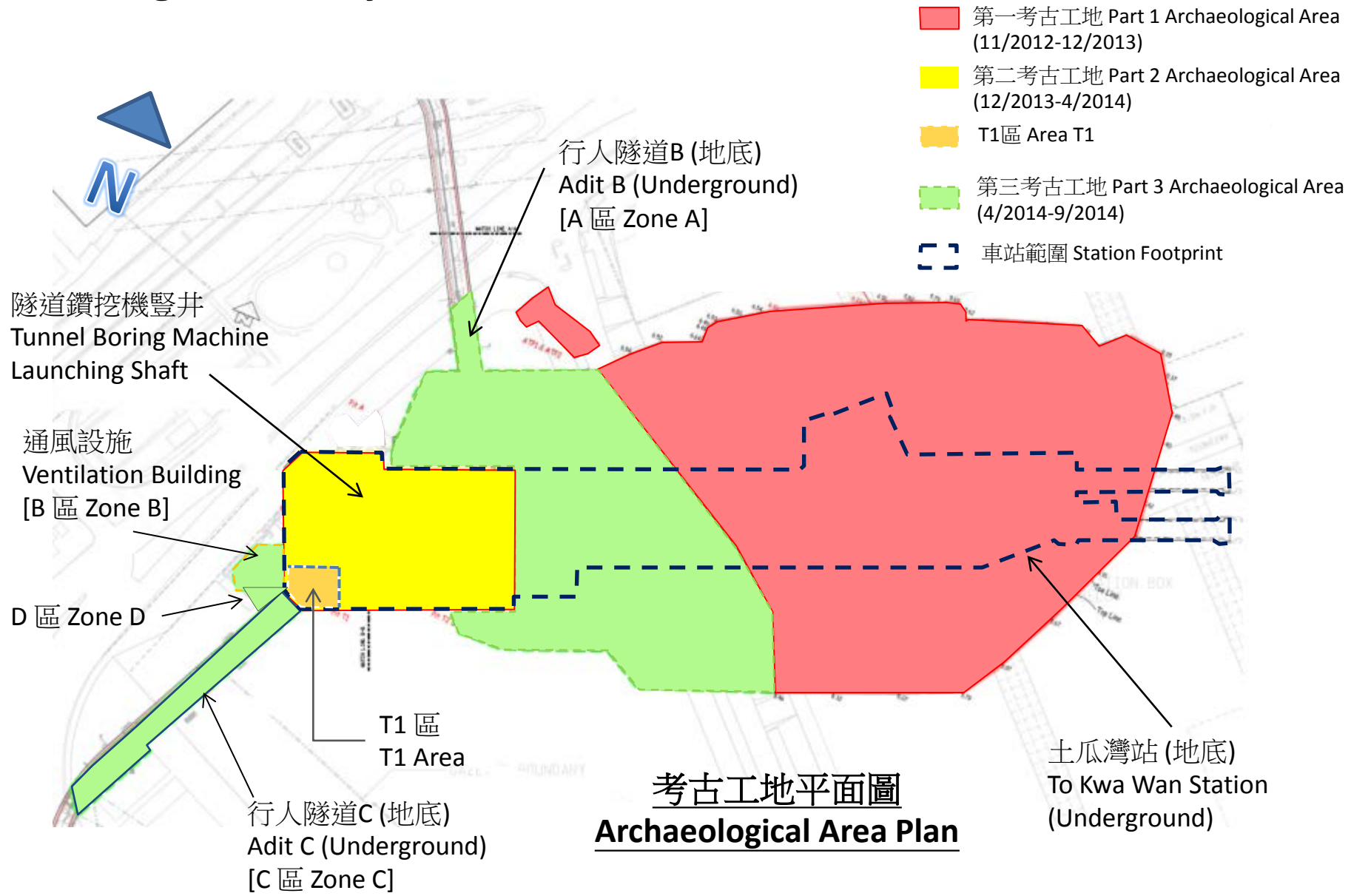
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鐵路拓展處 RAILWAY DEVELOPMENT OFFICE



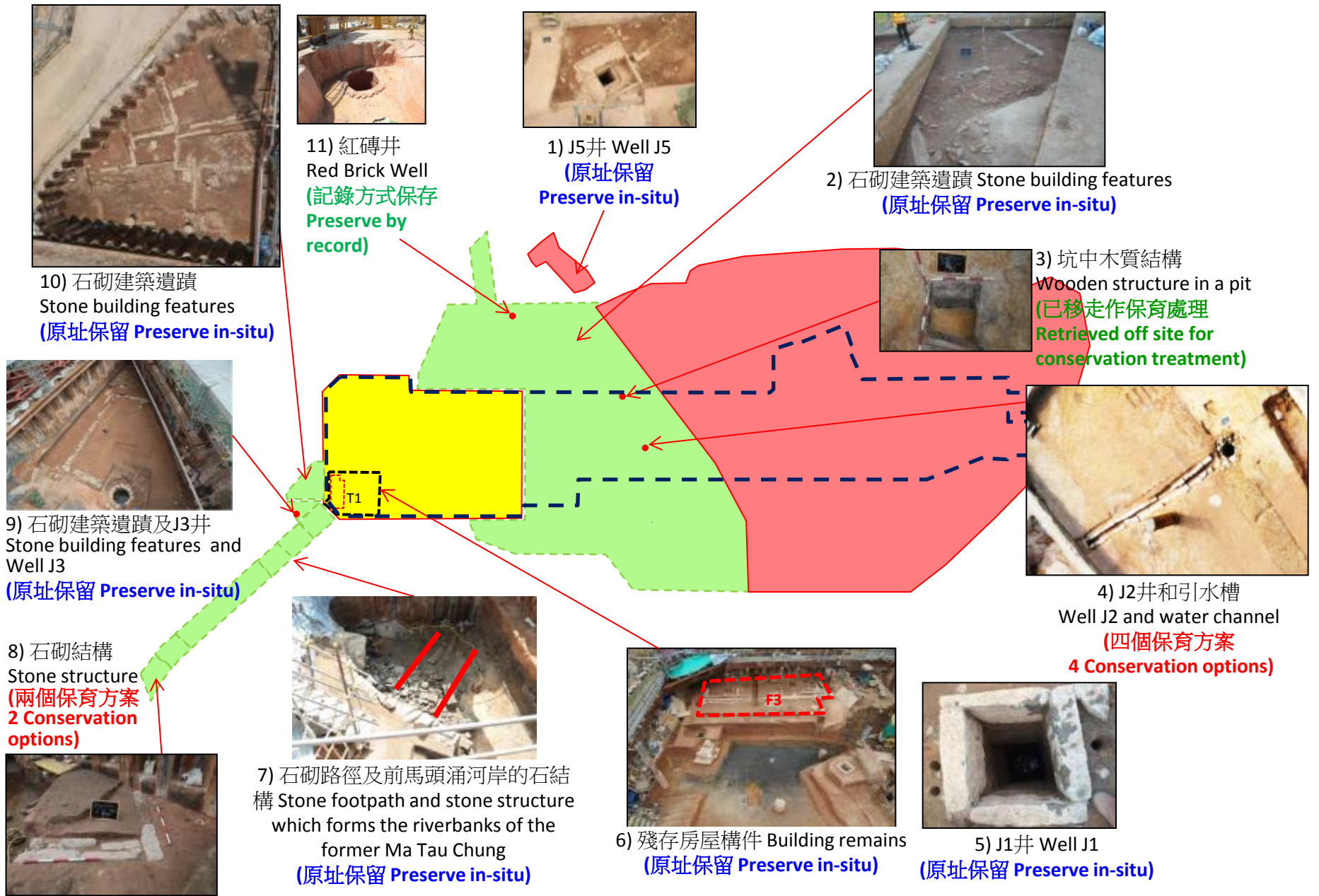
路政署
HIGHWAYS DEPARTMENT

Archaeological Survey at To Kwa Wan Station



考古工地平面圖 Archaeological Area Plan

Conservation Options for Archaeological Features Discovered



10) 石砌建築遺蹟
Stone building features
(原址保留 **Preserve in-situ**)



11) 紅磚井
Red Brick Well
(記錄方式保存
Preserve by record)



1) J5井 Well J5
(原址保留
Preserve in-situ)



2) 石砌建築遺蹟 Stone building features
(原址保留 **Preserve in-situ**)



3) 坑中木質結構
Wooden structure in a pit
(已移走作保育處理
Retrieved off site for conservation treatment)



9) 石砌建築遺蹟及J3井
Stone building features and Well J3
(原址保留 **Preserve in-situ**)



4) J2井和引水槽
Well J2 and water channel
(四個保育方案
4 Conservation options)

8) 石砌結構
Stone structure
(兩個保育方案
2 Conservation options)



7) 石砌路徑及前馬頭涌河岸的石結構
Stone footpath and stone structure which forms the riverbanks of the former Ma Tau Chung
(原址保留 **Preserve in-situ**)



6) 殘存房屋構件 Building remains
(原址保留 **Preserve in-situ**)



5) J1井 Well J1
(原址保留 **Preserve in-situ**)

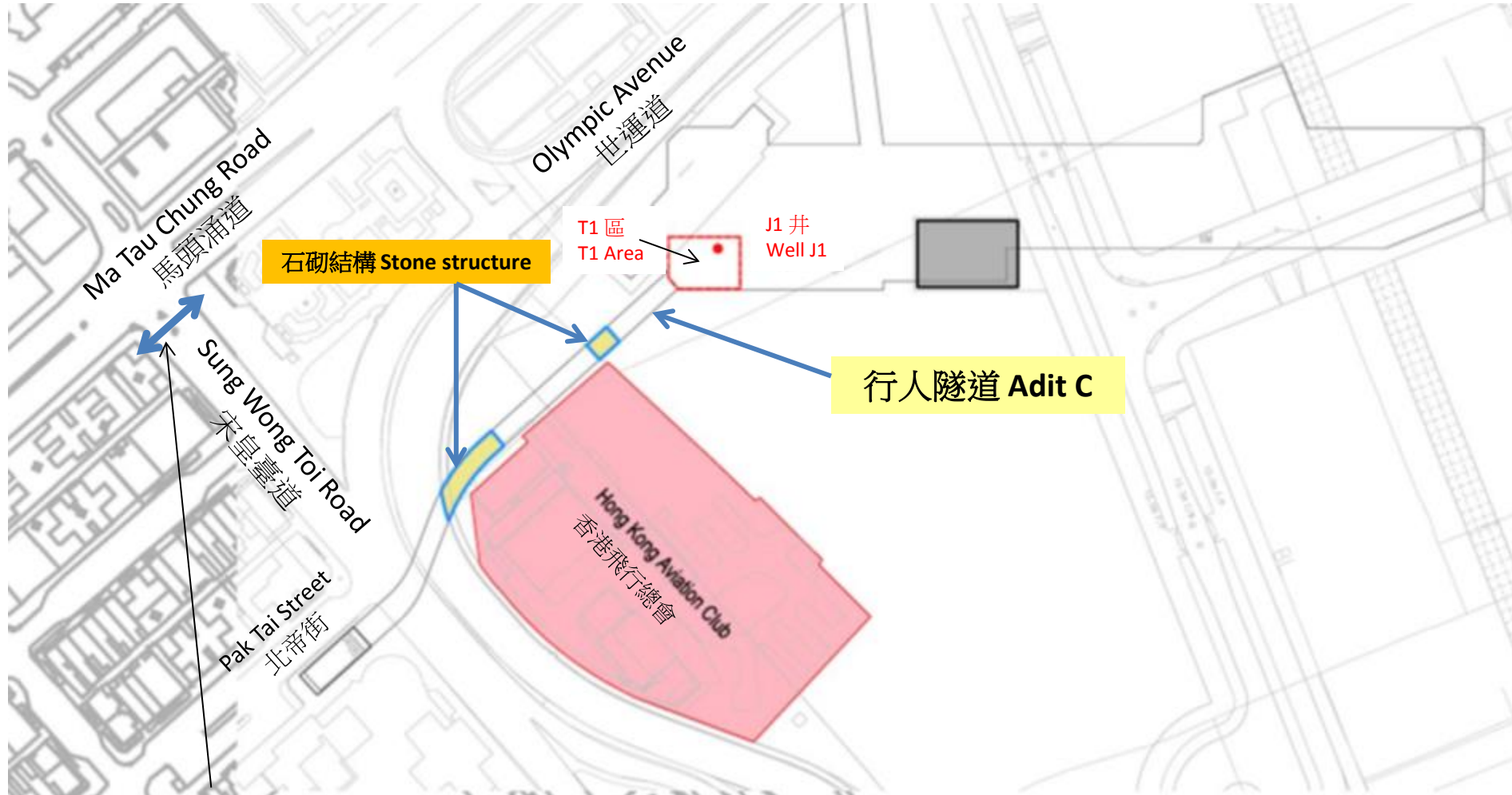


J2 井和引水槽的保育方案

Conservation Options for Well J2 and Water Channel

方案 Option	工程風險 Construction risk	對車站設計的影響 Impact to station design	文物保育角度 Heritage Viewpoint
1	<ul style="list-style-type: none"> 重置後可能與原本狀況整體上有輕微分別 Possible slight difference to the original condition generally after re-assembly 	<ul style="list-style-type: none"> 除因應T1區保育方案及大堂展示櫃的改動外並無額外修改 No additional change to the modification due to T1 Area conservation scheme and display cabinets in concourse 	<ul style="list-style-type: none"> J2井及引水槽完整性受影響 展示和詮釋安排較靈活，增加教育果效 Integrity of Well J2 and water channel would be impaired Interpretation and display would be flexible to enhance educational value
2	<ul style="list-style-type: none"> 打樁工程有可能遇上孤石層，產生的震動可能影響井的結構 為避開孤石亦可能需要另覓打樁位置，因而涉及額外施工時間及開支 搬運巨型結構的過程可能影響井的結構 Piling works through corestone layers may cause vibration that affects the well structure Find another piling location to avoid conflict with corestone layers may incur additional time and cost Well may deform during relocation of the massive structure 	<ul style="list-style-type: none"> 除因應T1區保育方案及大堂展示櫃的改動外並無額外修改 No additional change to the modification due to T1 Area conservation scheme and display cabinets in concourse 	<ul style="list-style-type: none"> J2井較完整地保存 引水槽文物價值較低，故採用不同保育方法 Well J2 would be kept intact Water channel is of lower heritage value thus a different conservation approach is applied
3	<ul style="list-style-type: none"> 打樁工程有可能遇上孤石層，產生的震動可能影響井的結構 為避開孤石亦可能需要另覓打樁位置，因而涉及額外施工時間及開支 Piling works through corestone layers may cause vibration that affects the well structure Find another piling location to avoid conflict with corestone layers may incur additional time and cost 	<ul style="list-style-type: none"> 車站範圍須進一步擴大，而且須修改設計以承托巨型結構 Station area needs to be further enlarged, and the design has to be revised for supporting the massive structure. 	<ul style="list-style-type: none"> 完整保存J2井及引水槽 因其位處將來路面以下，展示和詮釋較為困難 Integrity of Well J2 and water channel retained As they are located at a level lower than the future ground level, display and interpretation would be difficult
4	<ul style="list-style-type: none"> 打樁工程有可能遇上孤石層，產生的震動可能影響井的結構 為避開孤石亦可能需要另覓打樁位置，因而涉及額外施工時間及開支 Piling works through corestone layers may cause vibration that affects the well structure Find another piling location to avoid conflict with corestone layers may incur additional time and cost 	<ul style="list-style-type: none"> 車站範圍須進一步擴大，但比方案三的範圍較少，而且須修改設計承托巨型結構 Station area needs to be further enlarged, but the enlargement required is smaller than Option 3. Also, the design has to be revised for supporting the massive structure. 	<ul style="list-style-type: none"> 完整保存J2井 引水槽文物價值較低，故採用不同保育方法 因其位處將來地面以下，展示和詮釋較為困難 Integrity of Well J2 retained Water channel is of lower heritage value thus a different conservation approach is applied As they are located at a level lower than the future ground level, display and interpretation would be difficult

行人隧道 C 的走線 Alignment of Adit C



Existing pedestrian crossing
原有行人過路處

附件六

就第三考古工地 C 區南端遺蹟的兩個保育方案建議的比較

項目	方案一	方案二
保育方案內容	原址保留	記錄方式保存
方案對工程/車站設計的影響	<ul style="list-style-type: none"> 整條由 T1 區至北帝街行人隧道會受到影響。港鐵公司曾考慮研究替代路線，但因附近土地須配合車站及列車隧道建造工程作為臨時工地，故此現階段不能確定附近土地的考古潛在價值。預計在 2017 年下半年，當部分相關工程完成後，才可騰出空地作進一步考察，以探討合適替代路線。 受到附近現有建築物及道路的限制，其他連接北帝街及車站替代隧道的建造可行性或較低，但仍會研究替代線。 	<ul style="list-style-type: none"> 對 C 區南端遺蹟以記錄方式保存，因 C 區北端遺蹟會原址保留，港鐵公司仍然需要為 C 區南端至車站的一段行人隧道研究替代隧道走線。 如方案一，預計在 2017 年下半年，才可作進一步考察，以探討合適的替代隧道走線。
方案對乘客/行人的影響	<ul style="list-style-type: none"> 即使能夠有合適的替代隧道走線，整段行人隧道預計亦未能與車站同步完工，而需要以臨時地面通道往來車站出入口。若最終因為後來的考古發現或現場環境限制而未能有合適的替代隧道走線時，北帝街一帶的居民可能需要使用現有馬頭涌道行人過路設施往來土瓜灣 	<ul style="list-style-type: none"> 若未能成功找到合適的替代隧道走線，則此段行人隧道便需要以地面行人路代替；即使能夠有合適的隧道走線，此段行人隧道預計亦未能與車站同步完工，而需要以臨時地面通道接駁至車站出入口。至於橫過宋皇臺道連接北帝街和 C 區南端的一段行人隧道則不受影

項目	方案一	方案二
	<p>站。</p> <ul style="list-style-type: none"> • 港鐵公司亦會探討在其他合適位置，加設地面通道橫過宋皇臺道的可行性，以縮短北帝街與車站出入口之間的步行距離。 • 對北帝街附近的居民往來車站帶來不便。 	<p>響，乘客可使用此行人隧道由北帝街通往啟德發展區再往車站。</p> <ul style="list-style-type: none"> • 能減低對北帝街附近的居民往來車站的不便。
<p>文物保育 角度</p>	<ul style="list-style-type: none"> • 由於遺蹟將原址保留，其完整性不受影響。 	<ul style="list-style-type: none"> • 由於部分遺蹟將被移除，其完整性受到一定程度的影響。

Enclosure 6

Comparison of two conservation options for the relics found at the southern end of Adit C at Part 3 Archaeological Area

Item	Option 1	Option 2
Details of Conservation Option	Preserve in-situ	Preserve by record
Impacts on the construction works / station design	<ul style="list-style-type: none"> The whole adit from T1 Area to Pak Tai Street will be affected. MTRCL has considered studying alternative alignment. However, the site nearby is temporarily required to facilitate the construction works of the station and train tunnel, so the archaeological potential of the site cannot be ascertained at this stage. It is anticipated that part of site area could be released after mid-2017 to facilitate the investigation of alternative route. Limited by the existing buildings and roads, the feasibility of constructing alternative adit to connect Pak Tai Street and the Station may be relatively low. However, the feasibility of constructing an alternative adit will still be explored. 	<ul style="list-style-type: none"> The relics at the southern end of Zone C will be preserved by recording. As the relics at the northern end of Zone C will be preserved in-situ, MTRCL is still required to study an alternative tunnel alignment between the southern end of Zone C and the station. Similar to Option 1, the study to explore suitable tunnel alignment can only commence in the second half of 2017.
Impacts on passengers/ pedestrians	<ul style="list-style-type: none"> Even if a suitable alternative tunnel alignment can be identified, it is anticipated that the whole adit cannot be completed with the station at the same time, and a temporary at-grade crossing is hence required for connecting to the station. If 	<ul style="list-style-type: none"> If alternative tunnel alignment cannot be identified, at-grade walkway would become the alternative to this section of the adit. Even if a suitable alternative tunnel alignment can be identified, it is anticipated that the whole

Item	Option 1	Option 2
	<p>a suitable alternative tunnel alignment cannot be identified eventually due to subsequent archaeological finds and site constraints, residents living in the vicinity of Pak Tai Street may need to use the existing crossing at Ma Tau Chung Road to access to the station.</p> <ul style="list-style-type: none"> • MTRCL would also explore the feasibility of providing at-grade pedestrian facilities for crossing Song Wong Toi Road at a suitable location with a view to shorten the walking distance between Pak Tai Street and the station entrance. • Will cause inconvenience to residents living in the vicinity of Pak Tai Street in accessing to the station. 	<p>adit would not be completed with the station at the same time, and a temporary at-grade crossing is hence required for connecting to the station. The section of the adit crossing Sung Wong Toi Road linking Pak Tai Street and the southern end of Zone C would not be affected. Passengers can make use of this adit to go from Pak Tai Street to the Kai Tak Development Area, and then to the station.</p> <ul style="list-style-type: none"> • Can minimise the inconvenience caused to residents living in the vicinity of Pak Tai Street in accessing to the station.
Heritage Impact	<ul style="list-style-type: none"> • The relics will be preserved in-situ and their integrity would not be affected. 	<ul style="list-style-type: none"> • As some relics will have to be relocated, and their integrity will be affected to a certain extent.

附件七

就有關土瓜灣站的設計及建造工程的影響

項目	有關土瓜灣站的設計及建造工程的影響
修改通風設施設計及機房位置	<ul style="list-style-type: none">● 獨立考古專家團隊在第二考古工地的T1區(原設計作為車站機房位置)，和第三考古工地的B區(原設計作為通風設施位置)，發現了J1井及一些宋、元時期的石砌房屋建築遺蹟。為了讓這些遺蹟能夠被原址保留，港鐵公司會取消T1區和B區為車站建造範圍，車站大堂須在另一端擴大範圍，機房位置須移至近車站D出入口的位置，機房及通風設施的設計須作出修改，而施工工序亦須作出調整。
建造額外的鋼管樁保護牆分隔車站和其北面的考古遺蹟	<ul style="list-style-type: none">● 獨立考古專家團隊在第三考古工地A區的車站外北面發現了宋、元時期的石砌建築遺蹟。車站外北面雖然不在車站範圍內，但在原本的建造過程中車站外北面須進行挖掘工程；因此港鐵公司須額外建造鋼管樁保護牆，保護車站北面內出土的遺蹟，並分隔車站北面及車站施工位置，才可以讓車站挖掘及建造工程得以繼續進行。
於車站大堂內增設文物展示設施	<ul style="list-style-type: none">● 港鐵公司可按政府的要求於車站大堂內預留部分位置，以建造文物展櫃，展示部分相關出土文物。

Enclosure 7

Impacts on the design and construction of To Kwa Wan Station

Item	Impacts on the design and construction of the To Kwa Wan Station
Amending the design of the ventilation facility and relocating the plant room	<ul style="list-style-type: none">• The independent archaeological team discovered Well J1 and some stone building features of Song-Yuen Period in Zone T1 of the Part 2 archaeological area (i.e. the original position of the plant room) and in Zone B of the Part 3 archaeological area (i.e. the original position of ventilation facility). To enable in-situ preservation of the relics, MTRCL will need to exclude Zone T1 and Zone B from the original station design, while the footprint of the station concourse will have to be enlarged for relocating the plant room near entrance D of the station. The design of the plant room and the ventilation facility will have to be amended, while the associated construction works method has to be adjusted.
Construction of additional pipe pile wall to separate the station and the relics located at the north of the station	<ul style="list-style-type: none">• The independent archaeological team discovered some stone building features of Song-Yuan Period at Zone A of the Part 3 archaeological area located to the north of the station. Although the features are located outside the station footprint, the original station construction method involves excavation at its vicinity. As such, MTRCL will have to install an additional pipe pile wall to protect the relics and separate them from the construction area before the station construction can continue.
Providing display cabinet in the station concourse	<ul style="list-style-type: none">• MTRCL can, as per the government's request, reserve some areas in the station concourse to place display cabinets for the display of some archaeological discoveries.