

**Translation**

**For Information**

**February 2017**

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

**Progress and Financial Situation of the  
Construction of the Hong Kong Section of the  
Guangzhou-Shenzhen-Hong Kong Express Rail Link**

**(Quarterly Report for the Period ending 31 December 2016)**

**INTRODUCTION**

This paper aims to brief Members on the major works progress and financial situation of the construction of the Hong Kong section of the Guangzhou-Shenzhen-Hong Kong Express Rail Link (“XRL”) and the relevant monitoring work carried out by the Highways Department (“HyD”) for the period ending 31 December 2016.

**BACKGROUND**

2. At the meeting of the Subcommittee on Matters Relating to Railways (“RSC”) under the Legislative Council (“LegCo”) Panel on Transport in April 2010, Members agreed that reports on progress update and financial situation of the construction of the Hong Kong section of the XRL should be submitted at six-month intervals. To enhance the reporting to the LegCo on the progress update and financial situation of the construction of the Hong Kong section of the XRL, such reports have been submitted to the RSC at quarterly intervals since the fourth quarter of 2014.

— 3. This paper, which is appended with the progress report (**Annex**) of the MTR Corporation Limited (“MTRCL”), reports on the major works progress,

indicators and financial situation for the fourth quarter of 2016 (i.e. from 1 October to 31 December 2016).

## **PROGRESS UPDATE OF THE PROJECT**

4. The HyD, with the assistance of its Monitoring and Verification (“M&V”) Consultant, continued to monitor systematically the implementation of the works on the Hong Kong section of the XRL by the MTRCL under its monitoring mechanism and took appropriate follow-up actions. Such mechanism includes meetings at various levels (such as meetings of the Project Supervision Committee chaired by the Director of Highways, Project Coordination Meetings chaired by an Assistant Director of HyD, Contract Review Meetings (“CRMs”) chaired by HyD’s Chief Engineer) and regular site inspections.

5. Since the third quarter in 2015, the Government has been monitoring the progress of the remaining works of the XRL project against the revised commissioning target of the XRL in the third quarter of 2018.

6. As stated in MTRCL’s progress report, the overall progress of the Hong Kong section of the XRL was 87.4% as at the end of December 2016, which was ahead of the planned progress of 84.1% based on the target of commissioning of the XRL in the third quarter of 2018. According to assessment by the HyD of the Programme to Complete submitted by the MTRCL against the commissioning target of the third quarter of 2018, the most critical parts of the entire XRL project are the construction of West Kowloon Terminus (“WKT”) North (Contract 810A) (including the works for port area facilities); the works contracts for electrical and mechanical (“E&M”) systems currently being carried out at the WKT and tunnels, especially those related to the inspections and acceptance of fire services equipment; and the testing and commissioning (“T&C”) of the XRL that will soon commence. We are also concerned about the construction of WKT approach tunnel, and the coordination between the E&M works and civil works at the construction stage. Apart from the Hong Kong section of the XRL, the progress of works on the Mainland

section of cross-boundary tunnels from Huanggang to Mai Po being carried out by the Mainland side (i.e. the tunnel section from Hong Kong boundary to Huanggang) will have direct impact on the T&C of the entire XRL project. The progress of the relevant works is set out below.

(a) Construction of WKT North (Contract 810A)

7. According to the MTRCL's progress report, the most critical areas in relation to the construction of WKT North at the moment are the installation of external wall systems ("EWS") for the steelwork of the Station Entrance Building ("SEB"), and concrete structural works on various floor levels of the WKT. As regards the construction of Lin Cheung Road Underpass which was assessed as critical in the previous quarterly reports, its progress had become steady.

8. The HyD is very concerned about the progress of the steelwork erection for the SEB, which is highly complicated. The cumulative progress of the steelwork erection of the entire SEB was 99%, which was on schedule. The installation of the remaining steelwork is in progress. The contractor has completed the erection of temporary platform for the installation of EWS, including the supporting scaffolding for the EWS. Regarding the glazing panels and aluminium panels of EWS, they are being fabricated in prefabrication yards. The cumulative progress of fabrication of glazing panels and aluminium panels were 51% and 16% respectively, which can cope with the planned installation progress at initial stage. We have urged MTRCL to ask the relevant contractor to increase the number of prefabrication yards in order to improve the productivity to meet the installation requirement in the next quarter. Some of the fabricated panels have already been delivered to the work site of the WKT for installation.

9. Regarding the concrete structural works, its cumulative progress as at end December 2016 was 93%. The HyD has urged the MTRCL to closely monitor the manpower arrangement by the contractor, open up more works fronts and continue to improve the sequence of works for the construction of

concrete partition walls so as to expedite the progress of the remaining concreting works for the timely handover of relevant parts to the follow-on contractors for subsequent installation of the E&M and building services (“BS”) systems. The HyD and its M&V Consultant will continue to conduct regular site inspections and hold monthly CRMs and ad hoc meetings to follow up on and monitor the effectiveness of the proposals and measures implemented by the MTRCL.

10. In addition, the construction of the Mainland port area at the WKT is in progress. The progress of construction of concrete partition walls as at end December 2016 was 89%, and the finishes works, tile flooring and screeding works commenced in stages in the fourth quarter of 2016.

(b) Construction of Approach Tunnel at the North of WKT

11. As regards the progress of other construction works, the HyD noticed that there was risk of slippage for the road construction at the north of Jordan Road under WKT Approach Tunnel (South)(Contract 811B). The HyD and its M&V Consultant will continue to closely monitor the progress of the construction, and follow up with the MTRCL on the implementation of improvement measures.

(c) Track Laying Works

12. As for track laying works, the contractor has completed the concreting work for the trackform of the entire tunnel section, and 96% of the tracks have been laid. In addition, the contractor has completed the track laying works for the ten platforms on the south side of the WKT. It has also taken over the work site of the first ten platforms on the north side of the WKT (Contract 810A). The contractor has completed the concreting work for four of the ten platform trackforms, and will carry out the remaining trackforms’ construction and track laying works.

(d) Construction of Mainland Section of Cross-boundary Tunnels

13. The integrated T&C of the XRL will proceed through the cross-boundary tunnels connecting to the high speed rail network of the Mainland. After we had expressed our concern about the progress of the Mainland section of cross-boundary tunnels through various channels, the Mainland side responded positively, with the works expedited in order to meet MTRCL's T&C and trial operations programme. The HyD will continue to liaise with the Mainland side and closely monitor the progress of the works concerned in conjunction with its M&V Consultant.

(e) Electrical and Mechanical Systems and Their Respective Testing

14. The installation works on E&M systems were progressing at the WKT, tunnel sections, Shek Kong Stabling Sidings ("SSS") and various ventilation buildings. As a whole, apart from the installation works for fire services, plumbing and drainage equipment at the WKT (Contract 816D) and the associated approach tunnel (South) (Contract 811B) which remained critical, the progress of E&M installation works at other sections was on schedule in general. The progress is detailed below.

15. At the WKT, the contractors for various BS systems continued their works in the south and north ends of the WKT on each level, amongst which the installation of fire services equipment was relatively critical. As this activity will have direct impact on the subsequent inspections and acceptance of such equipment, the HyD paid particular attention to its progress and urged the MTRCL to closely monitor the manpower arrangement and coordination of works so as to improve progress.

16. As regards the tunnels, the overhead lines in the southbound tunnel from the boundary to Mongkok West Ventilation Building were installed as planned. The final installation of overhead lines and preparation for testing will be the focus of the next stage of the works. The entire optical fibre cable network had been connected to the Mainland communication system to pave

way for the integrated T&C of the signalling system.

17. The inspection and acceptance for the Phase II of fire services equipment at SSS had been completed. Preparation work for Phase III inspection, i.e. the final phase, was in progress.

18. Amongst the eight ventilation buildings, the Mongkok West Ventilation Building had completed its fire services inspections. The BS installation at the remaining seven ventilation buildings was in progress and the relevant fire services inspections are targeted for completion within 2017.

19. Regarding the control system, the network of Main Control System had been connected through all ventilation buildings, the SSS, the Operations Control Centre and the centralised E&M equipment room at the WKT. Testing of remote access and control functions of the E&M systems and installation of the associated control equipment at the Station Control Room at the WKT were in progress.

20. As a whole, the installation of E&M systems had proceeded as scheduled in general and shall pave way for the T&C and trial operations of railway system at the next stage.

(f) XRL Trains

21. The second set of XRL train was delivered to the SSS in January 2017 by sea and by road. The remaining seven sets of XRL train will be delivered to Hong Kong in due course.

(g) Testing and Commissioning and Trial Operations

22. The 16.7 km of overhead lines in the southbound tunnel from Shek Kong to Mongkok were energised in October 2016. The static tests and dynamic tests of speed up to 80kph for the first set of XRL train in that section of tunnel, including CTCS-2 test of the signalling system, were completed.

The MTRCL would continue to carry out on-site tests for various types of maintenance and rescue wagons in the first quarter of 2017.

23. The HyD would continue to coordinate with other Government departments and Mainland authorities to facilitate the timely completion of the T&C as well as the trial operations of the whole railway system.

**Transport and Housing Bureau**  
**Highways Department**  
**February 2017**

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Subcommittee on Matters Relating to Railways**

**Progress and Financial Situation of the Construction of the  
Hong Kong Section of Guangzhou-Shenzhen-Hong Kong Express Rail Link**

**(Report for the period between 1 October and 31 December 2016)**

**INTRODUCTION**

This paper presents the construction progress of the Hong Kong section of the Guangzhou-Shenzhen-Hong Kong Express Rail Link (“XRL”) project up to 31 December 2016.

**BACKGROUND**

2. The progress reported below is based on the target of delivering the XRL project for passenger service in the third quarter of 2018 (“2018 Schedule for Completion”). This paper outlines major works progress, key performance indicators (“KPIs”), as well as financial status for the period between 1 October and 31 December 2016.



## **MAJOR WORKS PROGRESS OF THE XRL PROJECT**

### **(I) Overall Progress of the Construction Works**

3. As at 31 December 2016, overall the XRL project was 87.4%<sup>1</sup> complete against the 84.1% planned progress according to the 2018 Schedule for Completion. In addition to the West Kowloon Terminus (“WKT”) which is the most critical area of the project, the electrical & mechanical (“E&M”) fitting out and track-laying works are also being closely monitored in light of their importance to the progress of testing & commissioning (“T&C”) and target completion in the third quarter of 2018.

### **(II) Major Progress on Tunnel Construction and Train Testing**

4. The first XRL train’s dynamic test along the pilot test section on the Down Track between Shek Kong Emergency Rescue Siding (“ERS”) and Mongkok West Ventilation Building (“MKV”) has been successfully carried out. The train will be running at full speed from WKT to the Mainland section during cross-boundary dynamic T&C scheduled to commence in mid-2017.

5. The second XRL train has been shipped to Hong Kong in January 2017 and delivered to the Shek Kong Stabling Sidings (“SSS”) for assembly and testing. The remaining seven trains will be delivered to Hong Kong within this year.

6. Following the completion of dynamic testing in the pilot test section, the next major milestone for the tunnel section is the readiness for overhead lines (“OHL”) energization in the remaining tunnel section. Civil and E&M teams are working closely to ensure the timely installation of permanent services and the removal of remaining temporary services by the first half of 2017.

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<sup>1</sup> Sum of all weighted percentages completed of all major contracts

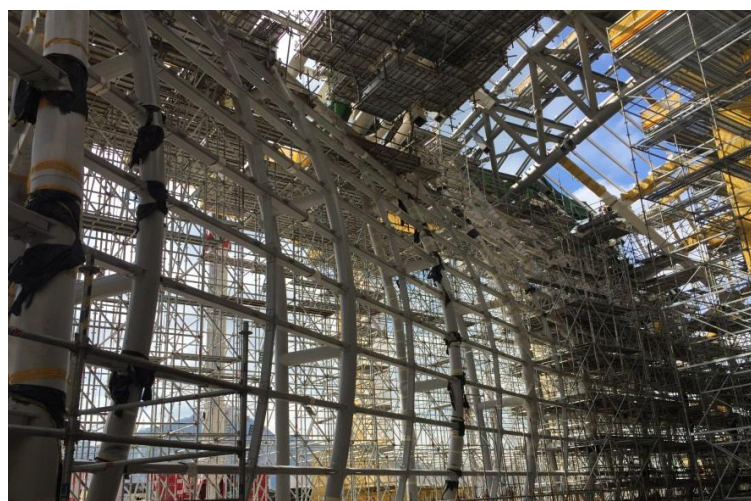
### **(III) Major Progress of the Construction of West Kowloon Terminus**

7. Overall excavation of the WKT was substantially completed. Meanwhile, 94.7% of the concrete structure has been cast, which is ahead of the planned progress of 90.8%.

8. The construction of the Station Entrance Building (“SEB”), which is on the critical path, remained on schedule. The erection of steel members on the eastern side of the SEB (facing Austin Station) as well as the southern side facade was completed.



Erection of lift, secondary and tertiary steel members at the eastern side of the Station Entrance Building



The facade at the southern side of the Station Entrance Building

9. Around 51% of glazing panels and 16% of aluminum panels for the External Wall System (“EWS”) have been fabricated, and the production rate is being closely monitored. The erection of the lighter “birdcage” scaffolding system and hanging platform was completed in December 2016. Installation of glazing panels at the western side of the SEB has commenced and is targeted for completion in mid-2017.



Installation of glazing panels at the western side of the Station Entrance Building

10. Internal wall construction in the Mainland Customs, Immigration and Quarantine (“MCIQ”) areas at Levels B2 and B3 was approximately 89% complete. The finished rooms are progressively being handed over for the Architectural Builder’s Works and Finishes (“ABWF”).

11. The ABWF and building services works at WKT are progressing at all levels. Coordination among civil and E&M contractors continued to facilitate site

logistic arrangements and additional resources continued to be mobilized on all new work-fronts.



Floor finishing at WKT platform level

12. Construction of the subway structure which is located under the southern section of the Lin Cheung Road (“LCR”) Underpass has commenced. With the completion of excavation for the LCR Underpass, it is expected that the structural works of the Underpass will be completed before end-2017.

#### **(IV) E&M and Signaling Systems**

13. Works under various E&M contracts are in progress and were 69.4% complete overall.

14. Trackwork construction has made good progress. The trackwork and overhead line contractor (Contract 830) has been given access to all of the XRL track areas to carry out installation works. Out of the total track length of 72.8km, over 95.7% of track has been laid. All track laying in the main tunnels has been completed by November 2016, marking another significant milestone for the project. Four track areas were concreted at WKT North (Contract 810A) platform level, connecting the rails continuously from WKT South (Contract 810B) to Hong Kong/Shenzhen Boundary (“the Boundary”). Precast concrete track slabs were being laid by special lifting gantry to speed up the progress. All remaining track laying works are expected to be completed by the first quarter of 2017.





Special lifting gantry for laying the precast slabs at WKT North platform level

15. Installation of the 25kV OHL wire has reached approximately 57.9km, around 79.5% of overall completion. OHL wire stringing on the Down Track between the Boundary and MKV has been substantially completed.



OHL wire stringing in tunnel

16. Installation of building services equipment in the Ventilation Buildings (“VBs”) was ahead of schedule; it was 89.1% complete against the planned target of 76%. Inspections carried out by the Fire Services Department (“FSD”) at SSS (Phase 2) and MKV have been completed. All tunnel ventilation fans, 104 in total, were delivered to various VBs, WKT and West Kowloon Plant Building for

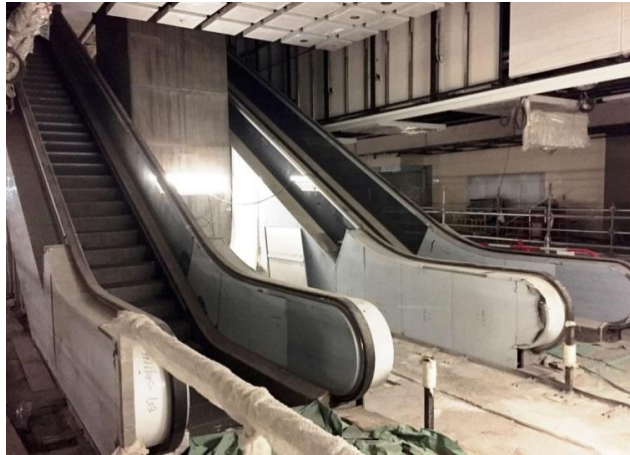
installation. Among these tunnel ventilation fans, 66 were installed, of which 34 passed the start-up test. Integrated testing between the Main Control System (“MCS”) and other E&M systems was being conducted in full swing at the VBs.

17. Optical fibres for the backbone communication system has been successfully connected to the Mainland network to provide data communication channels, with the first cross-boundary GSM-R voice call made, thereby enabling CTCSS-3 signaling system testing to commence in mid-2017 as scheduled.

18. At WKT, E&M contractors have been given access to an area of around 368,000m<sup>2</sup>, i.e. about 76.9% of the total floor area, for E&M installation under Contracts 810A, 810B and 811B. Building services of WKT were 60.6% complete against the planned target of 50.6%.

19. Access to the WKT Station Control Room was given to E&M contractors. The MCS contractor (Contract 853) has installed the control consoles and was coordinating among different interfacing E&M contractors to install their respective equipment. The MCS data communication network has connected all VBs and WKT with the Operations Control Centre at SSS.

20. Out of the 98 lift shafts where access has been given in WKT and VBs, installation of 88 lifts has commenced, of which 63 lifts have gone through the initial Stage 1 testing with the temporary power supply. At WKT, 45 escalators are undergoing installation with 29 already installed and having completed initial testing.



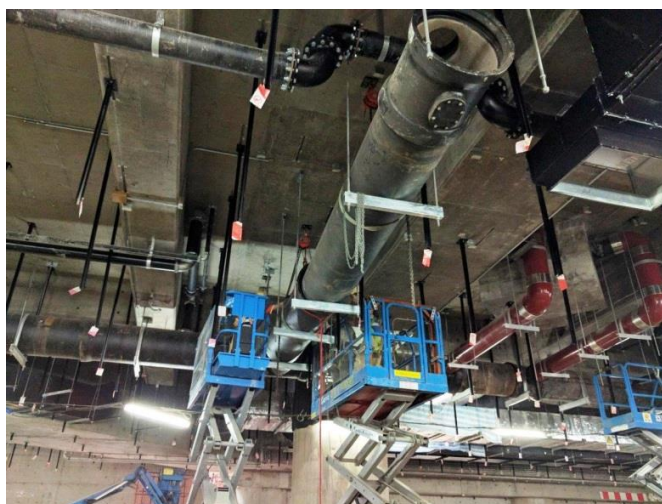
Installation of escalators at WKT

21. CLP Transformers and 11kV equipment at WKT North substations have been energized, while those at WKT South substations will be energized progressively in the first and second quarters of 2017 to tie in with the E&M system T&C programme. So far, 51 out of 75 11kV transformers have been energized at various VBs, SSS and WKT substations. All 11kV cables in the main tunnels between Mai Po and Mongkok West VBs had been laid well before the OHL energization.

22. The progress of Environmental Control System installation at WKT continues to be steady. Installation of services inside the seawater intake cell as well as the 1,000mm diameter seawater pipes has been substantially completed.

23. The power supply system installation is progressing steadily. System acceptance tests for the 110V DC charger system at WKT South substations have commenced and are targeted for completion in January 2017. Cable laying works at Levels B2 and B3 of the WKT South are in progress.

24. Installation of the irrigation water supply system in the plant room at WKT North Level B1 is ongoing. The 600mm diameter drainage pipes at WKT North Level B1 connecting to the terminal manhole are being installed.



Installation of 600mm diameter drainage pipes at  
WKT North Level B1

## **(V) Construction Challenges**

### **(a) West Kowloon Terminus**

25. The fabrication of glazing and aluminum panels for the EWS remains a key focus. The Corporation has been closely monitoring the situation and working with contractors in order to meet the installation programme on site.

26. Temporary haul roads, access openings and ramps at WKT have been progressively closed and removed to facilitate the remaining structural works. The civil and E&M contractors continued to liaise and cooperate with each other to avoid any potential clashes of works schedule and to carefully work out feasible access for works and space for materials delivery or storage to suit their respective construction sequence.

### **(b) Labour Shortage**

27. As at the end of December 2016, a daily average of about 7,637 construction workers and technical / professional staff members were employed for the works during the reporting period. The demand for E&M workers has been increasing since the project moved towards installation and finishing works. Labour in Hong Kong is still in short supply for certain work trades and the Corporation continues to work with the Government to help contractors on the



recruitment of workers and application for labour importation under the Supplementary Labour Scheme.

**(VI) Preparation and Interface Works**

28. Construction of the MCIQ areas remains on the critical path. Phased handover plan of the MCIQ areas to the Mainland authorities for their equipment installation and T&C is being coordinated through the Government.

29. It was expected that the works, including track laying, OHL and E&M systems installation, on the Mainland side of cross-boundary tunnel would be complete by the first quarter of 2017 to pave the way for the cross-boundary Dynamic T&C in mid-2017. Close liaison with the Mainland constructor is ongoing through the Government.

**(VII) Updated Financial Situation of the XRL project**

30. As at 31 December 2016, the cumulative expenditure for the awarded contracts was \$60.7 billion.

31. The Corporation will continue to closely monitor the costs and progress of the XRL project. Details of the financial situation of the project are shown in Annex 2.

**MTR Corporation Limited**

**February 2017**

## Annex 1 - KPIs of Major Works Progress

### Summary of the Construction Progress of the XRL Project

Works Commencement Date	26 January 2010
Target Completion Date	Q3 2018
Works Progress	Overall completion progress: 87.4% [as at end December 2016]

### Progress of Key Civil Works Contracts

Cumulative progress of contracts for WKT construction:

Contract No.	Concrete structural works	Terminus excavation works
	End December 2016	End December 2016
810A	92.8% (87.7%)	99.1% (98.5%)
810B	99.9% (99.1%)	100% (100%)

*Percentage in brackets is the planned progress of the Q3 2018 Schedule for Completion*

Cumulative progress of contracts for tunnel construction:

Contract No.	Actual progress	Planned progress*
	End December 2016	End December 2016
811A	100%	100%
811B	86.7%	86.2%
820	100%	100%
821	100%	100%
822	99.9%	99.9%
823A	100%	99.9%
823B	100%	99.6%
824	99%	98.3%
825	99.8%	99.4%
826	100%	100%

Cumulative progress of E&M works:

E&M Works Progress	Actual progress	Planned progress*
	End December 2016	End December 2016
WKT Building Services	60.6%	50.6%
Track Laid	95.7%	91.9%
Overall installation	59.8%	40.7%
Overall E&M	69.4%	59.4%

*\* Percentage is the planned progress of the Q3 2018 Schedule for Completion*

## Annex 2 - Financial Expenditure

### Expenditure report ending 31 December 2016

Table 1 – Situation of Expenditure

	<b>Awarded contract sum for the contracts (\$ million)</b>	<b>Cumulative expenditure (\$ million)</b>
Railway Tunnels	22,495.1	29,823.2
WKT	14,608.4	23,203.1
E&M Works	8,208.3	7,668.4
<b>Total</b>	<b>45,311.8</b>	<b>60,694.7</b>

Table 2 – Situation of substantiated claims

	<b>Claims resolved</b>			<b>Claims unresolved</b>		
	Number	Amount claimed originally* (\$ million)	Amount awarded <sup>#</sup> (\$ million)	Number	Amount claimed* (\$ million)	Interim award (\$ million)
Railway Tunnels	121	3,317	1,732	416	9,218	2,380
WKT	122	10,078	3,847	237	1,623	676
E&M Works	3	0	0	92	4,554	578
<b>Total</b>	<b>246</b>	<b>13,395</b>	<b>5,579</b>	<b>745</b>	<b>15,395</b>	<b>3,634</b>

\*Amount stated in the contractor's detailed claim report.

<sup>#</sup> The amount awarded means the payment for claims resolved.

As at 31 December 2016, the Corporation had received 991 substantiated claims and the amount claimed in total was approximately \$28.8 billion, representing 63.5% of the awarded contract sum for the contracts. The Corporation has been discussing the details of the claims with the contractors concerned, and would thoroughly assess the amount claimed. The Corporation would process each claim in a prudent manner, and the contractors would have to provide sufficient justifications and information. As at 31 December 2016, 246 cases were resolved and about \$5,579 million was awarded, representing about 12.3% of the awarded contract sum for the contracts. Subject to the needs of individual works and progress of the relevant assessment and discussion, interim awards amounting to about \$3,634 million have been made for some cases.