

Translation

**For Information
December 2016**

**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 30 September 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 30 September 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 third quarter of 2016 (i.e. from 1 July to

30 September).

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

6. According to the MTRCL’s progress report, the overall progress of the Hong Kong section of the XRL was 84.1% as at the end of September 2016, which was ahead of the planned progress of 82.1% based on the commissioning target of 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 construction of West Kowloon Terminus (“WKT”) North (Contract 810A) is still the most critical contract of the entire XRL project. The works contracts for electrical and mechanical (“E&M”) systems currently being carried out in the WKT and tunnels, and the subsequent testing and commissioning (“T&C”) are also critical parts of the XRL project. 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. We will continue to monitor its progress closely. 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 three most critical areas in relation to the construction of WKT North at the moment are (i) steelwork erection and installation of external wall systems ("EWS") for the Station Entrance Building ("SEB"); (ii) concrete structural works on various floor levels of the WKT; and (iii) construction works for the Lin Cheung Road Underpass. The latest progress of the works on these three areas is detailed below.

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 89%, which was on schedule. The construction of reinforced steel concrete slab at the top of the V-trusses was complete. The contractor has also removed the temporary steelwork and platform for earlier V-truss erection, and commenced the erection of temporary platform for the installation of the EWS and the remaining steelwork including the supporting scaffolding for the EWS. Regarding the glazing panels and aluminium panels of EWS, they are being produced and fabricated in prefabrication yards with some of the fabricated panels already delivered to the work site of the WKT for installation. The HyD and the M&V Consultant will continue to closely monitor the progress of the works concerned.

9. Regarding the concrete structural works, its progress as at end September 2016 was 86.7%. The HyD was concerned about whether the concreting rate could allow the structural works to be completed on time and has urged the MTRCL to arrange sufficient manpower, open up more works fronts and improve the sequence of works for the construction of concrete partition walls so as to expedite the progress of 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 the 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. As regards the construction works for the Lin Cheung Road

Underpass, the excavation is expected to be completed in the fourth quarter of 2016 and the structural works is being carried out in full swing. Besides, the MTRCL is implementing improvement measures, including extension of working hours and enhancement of the design and construction sequence, in order to claw back the delay for part of the works for the pedestrian subway connecting to Kowloon Station.

11. In addition, the construction of the Mainland port area at the WKT is in progress, with the main focus being the construction of concrete partition walls at this stage. Its progress is on a critical path. The HyD and its M&V Consultant will continue to closely monitor the progress of the construction.

(b) Track Laying Works

12. As for track laying works, the contractor has completed the concreting work for the ten platform trackforms on the south side of the WKT. It has also taken over the work site on the north side of the WKT (Contract 810A) for the first four long haul train platforms for carrying out the remaining track laying works.

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

13. The integrated testing and commissioning of the XRL will proceed through the cross-boundary tunnels connecting to the Mainland Section of the XRL. After we had expressed our concern on the progress of the Mainland Section of cross-boundary tunnels through various channels, the Mainland side increased manpower resources to expedite the works to align with the works programme of the MTRCL. 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.

(d) E&M Systems and Respective Testing

14. The installation works on the E&M systems were progressing at the WKT, Shek Kong Stabling Sidings (“SSS”) and various ventilation buildings and tunnels. As a whole, the works on the E&M systems at the SSS,

ventilation buildings and tunnels were on schedule, while the works on the E&M systems at the WKT and the associated approach tunnel (south) (Contract 811B) remained critical. The progress is detailed below.

15. The contractors had completed the installation and testing of the E&M systems at the SSS, and were carrying out the T&C and any remaining works. Phase I fire services installations had passed the inspection by the Fire Services Department (“FSD”) with the relevant certificate issued. Phase II fire services installation was being completed progressively and ready for FSD inspection. The testing work for Phase III fire services installation was in progress.

16. Trackworks, and installation works on the overhead lines, trackside auxiliaries, the communication system and the signalling system have started in about 95.5% of the tunnel areas. As at end September 2016, the contractors had laid a total of 61.6 km (about 84.6%) of rail tracks and installed 43.4 km (about 60%) of overhead lines. A total of 577 km (100%) and 542 km (about 94.0%) of power cables had been laid in the southbound and northbound tunnels respectively between Shek Kong and Mongkok. The installation and testing of the lighting system, low voltage power supply system and drainage facilities were complete in that section of tunnel. The installation of fire hydrants was also complete.

17. Amongst the eight ventilation buildings, the building services (“BS”) installation at Mai Po, Pak Heung, Kwai Chung, Nam Cheong and Mongkok West ventilation buildings and the Shek Kong Plant Building North and South was complete. The testing and commissioning of these systems were progressing as planned, laying foundation for the subsequent fire services inspection. For the tunnel environmental control system, 38 large tunnel ventilation fans were installed in various ventilation buildings, with 24 of them having passed the start-up tests. 46 tunnel ventilation fans were also delivered to the WKT site, of which 18 were installed and ready for automatic start-up functional tests. As regards the power distribution system, four 11kV transformers at Shing Mun Ventilation Building were energised. Together with the other transformers at the WKT, various ventilation buildings and the SSS, there are 35 power transformers in service. The contractor had completed the installation and commissioning of all 25 kV traction supply system equipment, which will

provide power for the dynamic tests on the pilot section.

18. The preparatory work for the optical fibre cables network connecting the Mainland communication systems was ready. After connecting these optical fibre cables with those in the Mainland, the system integration tests for the communication systems, including the GSM-R radio communication system for train control, would commence, paving way for the high speed dynamic tests for XRL trains to be conducted in the second quarter of 2017. In parallel, tests were being conducted in respect of the Main Control System for the Operations and Control Centre in the SSS, as well as the E&M systems in each ventilation building for their remote access and control functions. The contractors commenced the installation of equipment at the Station Control Room at the WKT in October 2016.

19. At the WKT, the contractors for various BS systems continued their works in the major areas of the south and north ends of the WKT on each level. The contractors for various E&M systems have access to about 218,000 m² of the work site (about 59% of the gross floor area). The installation of E&M and communication systems equipment panels at the WKT central equipment room commenced. The installation of centralised chillers and heat exchangers on B3 Level at the south end of the WKT was complete. The seawater intake culvert and pipeline installation work was 80% complete. 114 cabinets were installed in the BS control system for the WKT. The installation of fire services plumbing and drainage systems inside the plant room was substantially complete. The irrigation system installation works at B1 level of the WKT had commenced. The 4 transformers and 44 low voltage switchboards on the north side of the WKT had been installed and commissioned. The installation of communication systems in the communication plant room on B2 level on the north side of the WKT was complete and the respective contractors had started to install the signalling equipment and control panels/modules for subsequent tests. Cable installation at the south end of the WKT on B2 and B3 levels had also commenced.

20. Regarding the installation of lifts and escalators in the WKT and various ventilation buildings, 33 escalator shafts and 66 lift shafts had been handed over to the contractors, with 23 escalators and 46 lifts installed and

tested.

21. As a whole, the installation of E&M systems had proceeded as scheduled. HyD would continue to coordinate with the relevant Government departments and Mainland authorities to ensure the timely completion of the testing and commissioning as well as the trial operations of the whole railway system.

(e) XRL Trains

22. The first set of XRL train was delivered to the SSS in end September 2016 by sea and by road. The train cars were then assembled in the Running Maintenance Shed. The remaining eight sets of trains will be delivered to Hong Kong in due course.

(f) Testing and Commissioning and Trial Operations

23. The first set of XRL train undertook static tests in the SSS in early October 2016 and was fed with 25kV traction supply for low speed dynamic tests. The 16.7 km of overhead line in the down track tunnel from Shek Kong to Mongkok was energised in October 2016 with 25 kV traction supply. The XRL train would undertake dynamic tests of up to 80 kph in that section of tunnel in the fourth quarter of 2016.

**Transport and Housing Bureau
Highways Department
December 2016**

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Subcommittee on Matters Relating to Railways**

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(Report for the period between 1 July and 30 September 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 30 September 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 July and 30 September 2016.

MAJOR WORKS PROGRESS OF THE XRL PROJECT

(I) Overall Progress of the Construction Works

3. As at 30 September 2016, overall the XRL project was 84.1%¹ complete against the 82.1% planned progress according to the 2018 Schedule for Completion. West Kowloon Terminus (“WKT”) remains the most critical area for total completion due to the volume of work in a sizable station. Since the civil construction works at all main tunnel sections have been substantially completed, more focus has been put on the electrical & mechanical (“E&M”) fitting out and track-laying works which are critical 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. Civil construction works for all track areas at the southern section of the approach tunnels (Contract 811B) have been substantially completed and access to these areas has been provided for track laying. The focus now is to complete the internal walls construction and provide access for the E&M contractors.

5. Installation of permanent services within the 16km pilot test section on the Down Track between Shek Kong Emergency Rescue Siding (“ERS”) and Mongkok West Ventilation Building (“MKV”) has been completed and temporary services were being removed in preparation for the energization of overhead line (“OHL”) and start of dynamic tests for the first train.

6. The first of the nine high-speed trains for the XRL project was delivered to the Shek Kong Stabling Sidings (“SSS”) in late September 2016. Following assembly, static tests and low-speed dynamic tests at SSS, the train will undergo dynamic testing along the pilot test section in November 2016.

¹ Sum of all weighted percentages completed of all major contracts



The first XRL train undergoes assembly and tests at SSS

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

7. Overall excavation of the West Kowloon Terminus (“WKT”) was 99.3% complete, and 90.3% of the concrete structure has been cast, which is generally in line with the planned progress of 99.1% and 89.1% respectively.

8. Handover of the first four platform track areas at Level B4 of the northern WKT (Contract 810A) for track laying was achieved in end September 2016. This key milestone allows the commencement of E&M works for subsequent T&C.

9. All the steelwork fabrication for the Station Entrance Building (“SEB”) was completed in late September 2016, and continued effort would be put to erect the remaining steel members ahead of the External Wall System (“EWS”) installation. Erection of the secondary and tertiary steel members on the eastern side of the SEB (facing Austin Station) as well as the southern side facade has commenced and is targeted for completion in end 2016.



Erection of 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

10. Around 17% of some 4,000 glazing panels for the EWS have been fabricated and the fabrication of aluminum panels has also started. The production rate is being closely monitored. The erection of the lighter “birdcage” scaffolding system and hanging platform for the subsequent cladding and glazing panels installation is in progress and is targeted for completion in the fourth quarter of 2016. Installation of sub-frames for glazing and aluminum panels at the western side of the SEB has commenced and is progressing as planned.

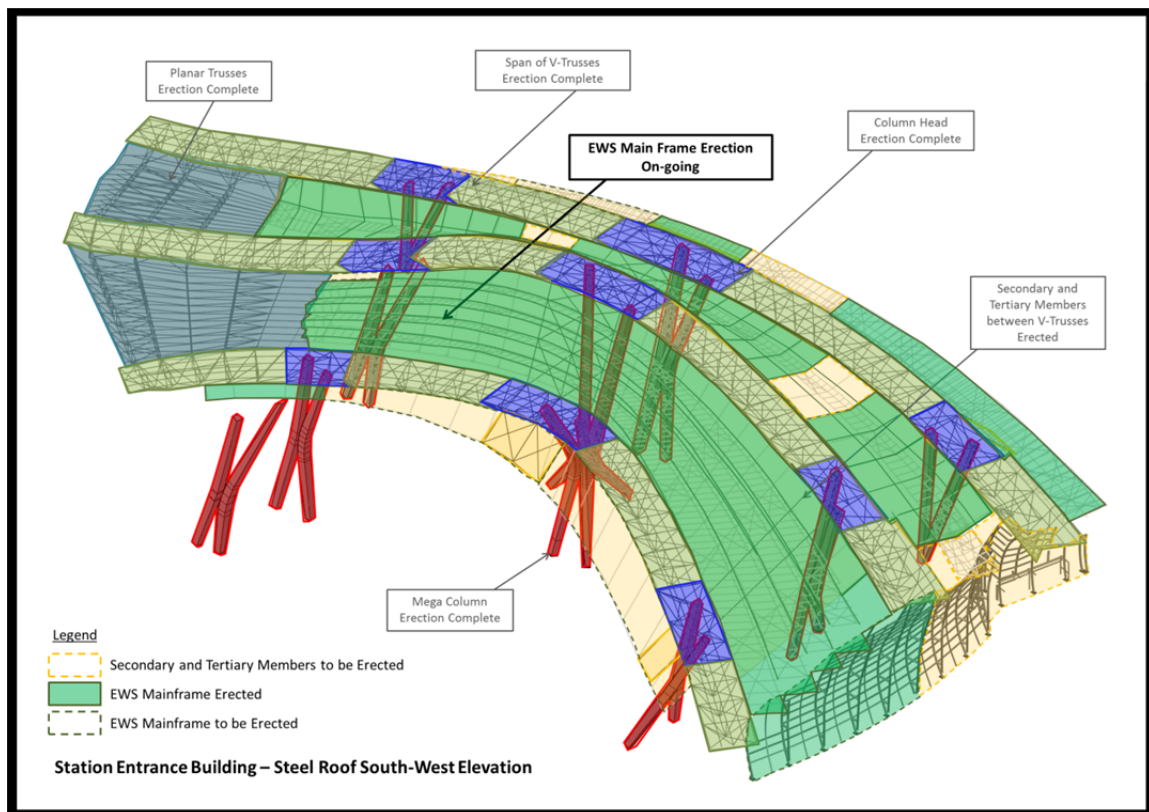


Installation of sub-frames for glazing and aluminum panels at the western side of the Station Entrance Building

11. Removal of the temporary supporting steelwork for V trusses has been completed. Concreting on top of the roof trusses has been substantially completed and the remaining non-structural concreting, such as those for planter walls and stairs, will be carried out in the third quarter of 2017 after substantial completion of the EWS works.



Completion of roof trusses concreting at the northern side of the Station Entrance Building



The latest progress of the structural works for the Station Entrance Building at WKT
(completed items shown in colours)

12. Internal wall construction has commenced in strategic areas of the Mainland Customs, Immigration and Quarantine (“MCIQ”), with approximately 42% of about 4,500m of internal walls completed.

13. Excavation at the Lin Cheung Road (“LCR”) Underpass and the subway under the Underpass continued and is targeted for completion in the fourth quarter of 2016. Various measures are being developed to speed up the subsequent structure works to catch up with the programme.

(IV) E&M and Signaling Systems

14. Works under various E&M contracts are in progress and were 62.4% complete overall.

15. The trackwork and overhead line contractor (Contract 830) has been given access to about 95.5% of the XRL track areas to carry out installation works.

Out of the total track length of 72.8km, over 84.6% of tracks had been laid. Track laying on the Down Track between the Hong Kong/Shenzhen Boundary (“Boundary”) and the northern end of WKT approach tunnels has been completed. Remaining track laying on the Up Track between the Boundary and ERS will be completed in the fourth quarter of 2016, signifying the completion of all trackwork in the main tunnels. Track bed concreting at the WKT South (Contract 810B) area has been substantially completed for 10 tracks. Turnout installation at southern section of the approach tunnels is gradually picking up and progressing satisfactorily. As the access to the first four platform track areas at WKT North has been provided by the civil contractor to Contract 830 contractor, precast concrete track slabs each weighing 3 tons will be delivered via tunnel to the platform track areas. Installation of the 25kV overhead line wire has reached approximately 43.4km, around 60% of overall completion.



Track and turnout installation at the southern section of the approach tunnels is in progress

16. The progress of E&M works for the pilot test section was on schedule. Installation of trackside auxiliaries, trackwork, OHL and signage were substantially completed. Rail grinding from ERS to MKV has been completed, ready for the first train’s dynamic testing.



Overhead line at ERS is ready for the first XRL train's dynamic testing along the pilot test section

17. Installation of building services equipment in the Ventilation Buildings (“VBs”) was ahead of schedule; it was 80.7% complete against the planned target of 70.5%. Fire services related systems at three VBs, ERS and SSS (Phase 2) were in the final stage of T&C for upcoming inspections by the Fire Services Department (“FSD”). Currently, a total of 38 tunnel ventilation fans have been installed in various VBs with start-up tests for 24 tunnel ventilation fans completed, followed by installation and testing of their control equipment. At WKT and West Kowloon Plant Building, 18 tunnel ventilation fans were installed out of 46 delivered to site.

18. Transmission backbone optical fibre cable laying and connection has been completed along the entire Down Track tunnel between the Boundary and WKT, and is ready for end-to-end testing of integrated T&C with the Mainland. Cross-boundary testing of GSM-R wireless communication system for train control will follow. Trackside E&M installation works are on-going in full swing on the northern part of the XRL tunnels to pave way for OHL energization of the remaining part of tunnels in the second quarter of 2017.

19. At WKT, E&M contractors have been given access to an area of around 281,000m², i.e. about 58.7% of the total floor area, for E&M installation under Contracts 810A, 810B and 811B. Building services of WKT were 53.1%

complete against the planned target of 47.7%.

20. Out of the 75 lift shafts where access has been given in WKT and VBs, installation of 66 lifts has commenced, of which 46 lifts have gone through the initial Stage 1 testing with the temporary power supply. At WKT, 33 escalators are undergoing installation with 23 already installed and having completed initial testing.



Installation of glazing at the front of lift shafts at WKT

21. CLP Transformers and 11kV equipment at WKT North and South substations have all been installed and will be energized progressively from the fourth quarter of 2016 to the second quarter of 2017 to tie in with the E&M system T&C programme. So far, 35 out of 75 11kV transformers have been energized at various VBs, SSS and WKT substations.

22. The progress of Environmental Control System installation at WKT continues to be steady. Major equipment including penstocks and travelling band screens inside the seawater intake cell has been installed. Installation of 1,000mm diameter seawater pipes is nearly complete.

23. The power supply system installation is also progressing steadily. Installation of the Uninterrupted Power Supply system for both Telecom Equipment Rooms at WKT South & North was complete. Cable laying work at

Levels B2 and B3 of the WKT South has commenced.

24. Installation of the fire services plumbing & drainage systems equipment inside three major pump rooms at WKT Level B3 was substantially complete.



Fire services plumbing & drainage systems in the pump room at WKT Level B3

(V) Construction Challenges

(a) West Kowloon Terminus

25. The completion of the EWS will be the critical item of work to enable the subsequent E&M and fitting out works to be carried out underneath the EWS. The Corporation is closely monitoring the progress and will work with contractors in order to meet the delivery programme for the Project.

26. Construction of the MCIQ areas is on critical path. The Corporation is working closely with the Government to coordinate with Mainland authorities so as to complete the MCIQ area to meet the target completion in the third quarter of 2018 in particular the handover of the MCIQ areas in phases to the Mainland side for their equipment installation which was being coordinated with the Mainland authorities through the Government.

(b) Labour Shortage

27. As at the end of September 2016, a daily average of about 7,348 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. Current progress of works on the Mainland side of cross-boundary tunnel is on a very tight programme which may impact the cross-boundary Dynamic T&C in the second quarter of 2017. Close liaison with the Mainland constructor is ongoing through the Government.

(VII) Updated Financial Situation of the XRL project

29. As at 30 September 2016, the cumulative expenditure for the awarded contracts was \$58 billion.

30. 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
December 2016

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, including a 6-month contingency period
Works Progress	Overall completion progress: 84.1% [as at end September 2016]

Progress of Key Civil Works Contracts

Cumulative progress of contracts for WKT construction:

Contract No.	Concrete structural works	Terminus excavation works
	End September 2016	End September 2016
810A	86.7% (85.4%)	98.8% (98.4%)
810B	99.8% (98.9%)	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 September 2016	End September 2016
811A	100%	100%
811B	83.1%	82.4%
820	100%	100%
821	100%	100%
822	99.9%	99.9%
823A	99.4%	99.3%
823B	99.8%	99.4%
824	98.1%	98.1%
825	99.7%	99.0%
826	100%	100%

Cumulative progress of E&M works:

E&M Works Progress	Actual progress	Planned progress*
	End September 2016	End September 2016
WKT Building Services	53.1%	47.7%
Track Laid	84.6%	81.0%
Overall installation	47.5%	36.6%
Overall E&M	62.4%	57.1%

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

Annex 2 - Financial Expenditure

Expenditure report ending 30 September 2016

Table 1 – Situation of Expenditure

	Awarded contract sum for the contracts (\$ million)	Cumulative expenditure (\$ million)
Railway Tunnels	22,493.8	29,448.3
WKT	14,596.3	21,335.3
E&M Works	8,206.6	7,213.1
Total	45,296.7	57,996.7

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)
Railway Tunnels	121	3,317	1,732	399	9,268	2,218
WKT	47	258	193	296	11,402	3,230
E&M Works	3	0	0	70	4,627	387
Total	171	3,575	1,925	765	25,297	5,835

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

As at 30 September 2016, the Corporation had received 936 substantiated claims and the amount claimed in total was approximately \$28.9 billion, representing 63.7% of the awarded contract sum for the contracts. The Corporation has been discussing the details of the claims with the contractors concerned, and would thoroughly assess the amount claimed. The Corporation would process each claim in a prudent manner, and the contractors would have to provide sufficient justifications and information. As at 30 September 2016, 171 cases were resolved and about \$1,925 million was awarded, representing about 4.3% 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 \$5,835 million have been made for some cases.