For discussion
November 2015

Legislative Council Panel on Transport
Subcommittee on Matters Relating to Railways

Hong Kong Section of the Guangzhou-Shenzhen-Hong Kong Express Rail Link

INTRODUCTION

On 3 July 2015, the Government reported to the Subcommittee on Matters Relating to Railways ("RSC") that it received, on 30 June 2015, the review results of the MTR Corporation Limited ("MTRCL") regarding the revised Programme to Complete ("PTC") and revised Cost to Complete ("CTC") of the Hong Kong section of the Guangzhou-Shenzhen-Hong Kong Express Rail Link ("XRL") project. The Government undertook to report to the RSC once it had completed the assessment of the MTRCL's review results on the revised PTC and the revised CTC.

2. This paper updates the RSC of the Government's assessment on the review results and seeks Members' support for the proposed way forward.

BACKGROUND

3. In April 2014, the Government was informed by MTRCL that, based on its assessment of the progress of the works, it would not be possible to complete the construction of the XRL by 2015. In May 2014, MTRCL proposed a revised PTC with commissioning of the XRL by end 2017. The Highways Department ("HyD"), with the assistance of its Monitoring and Verification ("M&V") consultant, considered that the

PTC could be attained provided that the target progress was met for the critical contracts and various major conditions[1] were satisfied. HyD notified the MTRCL of its assessment in writing on 23 October 2014. As regards the overall project cost estimate, the Government received a letter from MTRCL on 24 July 2014 informing the Government that the revised CTC for the XRL was $71.52 billion. MTRCL also announced the revised CTC in August 2014. Based on the information provided by MTRCL then and with the assistance of the M&V Consultant, HyD completed the assessment of MTRCL's CTC. Based upon this assessment[2], HyD and its M&V Consultant considered that MTRCL's CTC tended to be on the low side for budgeting purpose. HyD also noted that the second report of MTRCL's Independent Board Committee ("IBC") came to a similar conclusion. In November 2014, HyD urged MTRCL to review again the CTC in view of the IBC report and HyD's review findings, and to advise how the identified items which had not been included in the CTC would be addressed and allowed for. MTRCL undertook to further review the situation.

4. On 30 June 2015, MTRCL notified the Government of its latest review results regarding the revised PTC and revised CTC. As requested by the Government, MTRCL provided a paper to the RSC to report the review results (Paper No. CB(4)1228/14-15(01)). According to the MTRCL's latest assessment, the commissioning target of the XRL would have to be delayed further to the third quarter of 2018 ("Q3/2018"), which includes a six-month contingency period. As regards the CTC, the MTRCL advised that the amount would be revised to $85.3 billion, including a sum of $2.1 billion for contingency. Government's initial responses on the review results were provided to the RSC vide paper CB(4)1273/14-15(01). In gist, we said at the time that we would critically scrutinise MTRCL's review results, and would not accept any

[1] These conditions include whether the respective contractors had made their best endeavours in implementing the works; whether various assumed production rates have been met persistently, etc.

[2] HyD and its M&V Consultant, in their assessment, identified certain items which had not been included in the CTC or which would need to be reviewed to ensure adequate coverage in the risk allowances.

revised project completion date and cost estimate without substantiation; nor would the Government let taxpayers alone pay for the project's cost overrrun.

GOVERNMENT'S ASSESSMENT

Revised PTC

5. With the assistance of its M&V Consultant, HyD has completed its assessment on MTRCL's latest revised PTC and revised CTC for the project. It is considered that in order to achieve the revised PTC of Q3/2018, MTRCL has to closely monitor the progress of the critical contracts to ensure that the forecast production rates of critical activities can be reached, and that the assumptions made to support steady works progress, and testing and commissioning activities are achievable. Furthermore, MTRCL should timely discuss with the relevant contractors on the implementation of the revised programme, and establish an effective risk monitoring system to monitor mitigation measures which can effectively reduce the project risks.

6. Based on HyD's on-going monitoring and the review findings of the revised PTC, HyD is of the view that Contract 810A (West Kowloon Terminus Station North), with its critical paths being the structural concreting and the Station Entrance Building ("SEB") steel roof construction, together with the challenging programme for the follow-on electrical and mechanical ("E&M") and building services works, presents the highest risk of all the XRL contracts to the successful attainment of the revised PTC. Furthermore, Contracts 824 and 826, respectively for construction of tunnels from Ngau Tam Mei to Tai Kong Po and from Huanggang to Mai Po, are the next most critical contracts even though the progress of the tunnelling works under Contract 826 has become stable. HyD also notes that, as advised by MTRCL, the E&M programme assumptions in the revised PTC are the Corporation's own internal estimates based on their knowledge and experience. Early confirmation by E&M contractors of their ability to meet the timescales for the E&M works assumed by MTRCL in the revised PTC is essential.

Finally, MTRCL has to obtain all necessary statutory and other stakeholders' consents and complete all testing and commissioning before the operation of the XRL could commence. **In short, the achievement of the revised PTC by Q3/2018 is not without challenge**. The main challenges are to ensure that the assumptions, such as the forecast production rates and the time scales for the E&M works in the revised PTC are achievable, and the construction issues and risks, such as those for the SEB roof, can be resolved and managed. Government would closely monitor the progress and strive to secure the commissioning of the XRL as early as possible. The details of HyD's assessment of the revised PTC are provided at **Annex A**.

Revised CTC

7. Regarding the revised CTC, the review by HyD and its M&V Consultant included, based on the information provided by MTRCL, checking the assessment principles and methodologies for the cost items, including allowances for submitted and future claims, remaining risks and anticipated variations as well as the contingency. On the additional Project Management Cost ("PMC"), the proposed staff structure and overall resource plan for the remaining project period provided by MTRCL were checked. It should be noted that the review focused only on the estimate of the cost required to complete the project taking into account, amongst other things, allowance for future project risks. Assessment of any liabilities of MTRCL, its employees or its agents to the Government associated with the delivery of the XRL **did not form part of the review**. MTRCL's obligations regarding cost overrun will have to be ascertained separately, and the Government continues to reserve all its rights to pursue the warranties and obligations from MTRCL.

8. As a result, the review identified several cost items for which the allowances were considered to be on the high side with room for reduction. In total, it was considered that the potential net reduction under the revised CTC was about **$0.231 billion**.

9. Separately, the West Kowloon Terminus ("WKT") is designed with nine tracks for long haul and six for short haul trains. Based on the patronage forecast, it is anticipated that only ten tracks, i.e. six long haul and four short haul tracks will be required when the XRL begins commissioning in 2018. Depending on patronage growth, the remaining five tracks ("Day 2 Works") may be opened at a later stage. After careful deliberation, the Government affirmed the deferral of the completion of the Day 2 Works to a future date to be reviewed subject to patronage growth after commissioning of the XRL. As a result the revised CTC could be reduced by a further **$1.08 billion**[3].

10. The details of the initial assessment of the revised CTC are provided at paragraphs 4 – 7 of **Annex B**. On the basis of the initial assessment, HyD and the M&V Consultant considered that, in total, the revised CTC would be reduced from $85.3 billion to $83.989 billion.

11. Subsequently, the Government had had several rounds of exchange with MTRCL. Based on further information provided by MTRCL, HyD (with the advice of the M&V Consultant) agreed to adjust the revised CTC from $85.3 billion by $0.88 billion to **$84.42 billion** as follows –

(a) for the $2.1 billion contingency, the initial review found that tender risk allowance and additional insurance had room for reduction. The related reduction amount for these two items is **$0.111 billion**. Furthermore, upon further discussion, MTRCL considered that over the past few months since the announcement of the revised CTC, they had gained better understanding of the remaining risks and hence there was more

[3] Out of the original Entrustment Cost of $65 billion, $0.544 billion has been reserved for the Day 2 Works. The associated PMC is $0.036 billion. Hence a sum of $0.58 billion has been reserved for Day 2 Works. In assessing the revised CTC submitted by MTRCL on 30 June 2015, the M&V Consultant noted that if Day 2 Works were to be carried out, MTRCL should have allowed for price escalation for these Works, hence suggesting an addition of $0.5 billion to the revised CTC. Hence, the total cost of Day 2 Works, if executed at all, will comprise the original cost of $0.544 billion, the associated PMC of $0.036 billion, as well as additional allowance of $0.5 billion for price escalation, resulting in a total of $1.08 billion.

certainty of costs, so a further reduction of **$0.147 billion** to the contingency was agreed. Therefore, there should be a total reduction of **$0.258 billion** for the contingency provision;

(b) there are also reduction or addition of a few items due to adjustments to assumptions in calculation. For example, the revised CTC was based on a target programme for XRL opening in the fourth quarter of 2018, instead of the third quarter of 2018. An amount of **$0.338 billion** for prolongation cost is therefore deducted from the revised CTC. On the other hand, the review identified several missing items or items which warranted additional allowances. For example, the review by the M&V Consultant found that risk allowances for individual contracts might not be adequate in some aspects, such as finance charge and claims allowance. The total sum to be added should be **$0.446 billion.** The above adjustments result in a net addition of **$0.108 billion**. The net adjustment of items (a) and (b) above is hence a total reduction of **$0.15 billion** (i.e. - 0.258 billion + 0.108 billion); and

(c) in the revised CTC, the **additional PMC** is $1.94 billion. MTRCL's PMC for the XRL includes staff and corporate costs for the project team and project headquarters team, as well as other support services for the teams. According to the Entrustment Agreement ("EA"), adjustment to the PMC is subject to negotiation between the Government and MTRCL.

In the initial review, pending detailed information from MTRCL, the M&V Consultant used a top-down approach by applying the percentage time extension to assess if the proposed cost increase under different project teams were reasonable, and the result of this approach suggested some reduction to individual heads of additional PMC. During subsequent discussion, MTRCL explained that, in arriving at the additional PMC of $1.94 billion, MTRCL had used a bottom-up approach which estimated the cost required by making reference to the manpower strength required to manage the project. Having examined the

explanation and further information provided by MTRCL, HyD and M&V Consultant considered that MTRCL's approach was not unreasonable and that the Corporation's explanation provided further clarification on the cost increase. Following the discussion with MTRCL, HyD and the M&V Consultant agreed that the additional PMC should be reduced from $1.94 billion by **$0.15 billion** to $1.79 billion.

12. As alluded to in paragraph 9 above, the WKT is designed with nine tracks for long haul and six for short haul trains. Based on the patronage forecast, it is anticipated that only ten tracks, i.e. six long haul and four short haul tracks, will be required when the XRL begins commissioning in 2018. Depending on patronage growth, the Day 2 Works may be required at a later stage. After careful deliberation, the Government affirmed the deferral of the completion of the Day 2 Works, to a further date to be reviewed, subject to patronage growth after commissioning of the XRL. The deferral of Day 2 works would avoid incurring unnecessary maintenance cost for platforms and tracks which might not be required during the initial years. The cost of the Day 2 Works, amounting to $0.544 billion, will be taken out from the current Entrustment Cost of $65 billion. A sum of $0.036 billion will also be deducted from the PMC under the EA as the MTRCL is no longer required to complete the Day 2 Works at this moment. The total cost-saving for taking out Day 2 Works is **$0.58 billion**.

13. The items in paragraphs 11 – 12 above will result in a total net reduction of **$0.88 billion** from the revised CTC. In other words, the Entrustment Cost for the XRL should be revised to **$84.42billion** (i.e. $85.3 billion – $0.88 billion).

FUNDING

14. On 16 January 2010, the Finance Committee ("FC") of the Legislative Council ("LegCo") approved funding for the construction of the XRL. The total funding approved is $66.8175 billion. The relevant Public Works Subcommittee ("PWSC") papers are

PWSC(2009-10)68 and PWSC(2009-10)69. On 26 January 2010, the Government signed an EA with MTRCL regarding the construction of the XRL at an **Entrustment Cost** of $65 billion. The remaining funding approved by the FC (i.e. about $1.8175 billion) is allocated as Government costs, mainly for engaging consultants (such as M&V Consultant) to monitor the project and procuring Government facilities and equipment for the project.

15. As elaborated in the paragraphs above, irrespective of any liabilities and obligations of MTRCL regarding cost overrun, which will be pursued separately (paragraphs 7 and 16 refer) the Government's assessment is that an additional sum of $19.42 billion (i.e. $84.42 billion minus $65 billion) is required in order for the MTRCL to complete the XRL project by Q3/2018. Apart from this, the Government costs will also have to be increased by $0.1825 billion[4] to cover additional costs including M&V consultancy services and other studies due to delayed completion. In other words, an additional total amount of **$19.6025 billion** is required on top of the $66.8175 billion approved by FC in January 2010 to take forward the XRL project. Detailed breakdown of the total additional funding required for the construction of railway works and non-railway works for the project is set out in the attached draft PWSC papers, at **Annexes C and D** respectively.

16. The Government deeply regrets the severe delay in, and the substantial cost overrun of, the XRL project. As the Government has publicly stated before, it will ascertain the liabilities of the parties concerned and will reserve all the rights to pursue the warranties and obligations from MTRCL. The process of establishing a case against any particular party, be it MTRCL or any of its agents, is expected to be protracted. In the meantime, we must not lose sight of the fact that the XRL is a major transport infrastructure which will bring significant benefits to Hong Kong.

[4] Government costs include cost allowances for engaging M&V Consultants, financial consultant and other consultancy studies, as well as provision of government facilities, such as equipment for boundary control facilities at West Kowloon Terminus, etc.

AGREEMENT WITH MTRCL

17. Under the EA, the Government will have to bear the full cost of the project, including any increase, from the approved project estimates. The magnitude of the projected cost overrun (from $65 billion to $84.42 billion) is a matter of grave concern to the Government. As well, the Government is keenly aware of the sentiments of the public. Earlier, the Government had said that the Entrustment Cost had to be "capped", and that it would not let taxpayers alone pay for the project's cost overrun. Against this background, the Government had entered into lengthy discussion with MTRCL on how the matter should be addressed in a way which would go some way towards meeting public concern whilst respecting the responsibilities of the Corporation as a publicly listed company.

18. After considerable discussion, the Government and the MTRCL reached an agreement on 30 November 2015. In gist, the essential elements of the agreement are –

(a) the Government would bear and finance the project cost overrun up to $19.42 billion, with any further cost overrun to be borne and financed by MTRCL ;

(b) MTRCL will pay a Special Dividend at $4.4 per share to its shareholders (including Government as the majority shareholder);

(c) the Government reserves the right to take MTRCL to arbitration on the Corporation's liability and, as part of the arbitration, to challenge the cap[5] on MTRCL's liability stipulated in the EA

[5] The EA provides that whilst the Government may seek to pursue legal action against MTRCL for the delay of the XRL project, MTRCL's total aggregate liability to Government (whether in contract, tort (including negligence) or otherwise) is limited to the aggregate of the fees that have been paid and will be received by MTRCL from

signed between the Government and MTRCL in January 2010; and

(d) if the arbitrator determines that (i) MTRCL's liability cap is valid, and (ii) but for the liability cap, the Corporation's liability for the current cost overrun would exceed the liability cap, MTRCL will have to seek independent shareholders' approval at an extraordinary general meeting in order to pay its excess liability.

19. The agreement outlined in paragraph 18 above is conditional upon (i) the approval of MTRCL's independent shareholders at an extraordinary general meeting; and (ii) the approval by the FC of the LegCo of the funding for financing the current cost overrun within this legislative year. A separate paper prepared by MTRCL for the RSC meeting contains relevant details of its commitments under the agreement.

20. The Government recognises the positive steps taken by the MTRCL, in particular in relation to paragraph 18(a) above which requires amendments to the EA between the Government and MTRCL. The Government hopes that this will provide an acceptable basis for all parties concerned to take forth the project as time is of the essence. At the same time, the Government continues to reserve its right to pursue MTRCL's liability in regard to the current cost overrun by means of arbitration, notwithstanding the receipt of the Special Dividend, if materialised[6].

OTHER OPTIONS

21. We understand that there are some suggestions to simply suspend or even terminate the XRL contracts. The consequences of

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Government (i.e. essentially, the PMC). The Government reserves all its rights regarding MTRCL's liabilities and obligations for the cost overrun.

[6] The Government, as MTRCL's majority shareholder (the Government's shareholding of MTRCL is held in trust by the Financial Secretary Incorporated, which stood at about 75.74% of shares of MTRCL (equivalent to about 4,435 million shares)), will receive a sum of approximately $19.51 billion. The sum, if received, will go to General Revenue following established practice.

such a scenario, if materialised, are grave and must not be under-estimated.

Suspension of Contracts

22. According to a rough assessment by the HyD and MTRCL, the consequences if works had to be stopped because of lack of funding will be catastrophic. There will be huge additional **direct costs** associated with the suspension (not to mention termination) of the XRL contracts arising from the following areas –

(a) when the works contracts are suspended (or even terminated), the contractors are bound to submit monetary claims due to loss of profits and other expenses as a result. Although the contracts under XRL project are signed between MTRCL and the contractors, Government has entered into a deed poll with each of the contractors. These deeds provide that the contractors are liable to Government as if the Government and MTRCL are jointly named as the employer of the contracts, and vice versa. Hence, there are significant legal ramifications for the Government should the XRL works contracts be suspended (or terminated);

(b) during the suspension period, there will be costs including keeping essential staff and plants as well as arranging regular maintenance and inspection for the unfinished civil and electrical and mechanical works until the final termination of all the contracts;

(c) all unfinished works, tunnels and works sites, in particular the huge opening at WKT, would need to be secured and protected to ensure safety of the sites and adjoining properties. There would also be a need to upkeep the temporary traffic management schemes being implemented and monitoring of ground water to address safety concerns; and

(d) if the works contracts were eventually terminated, there would be costs associated with termination of employment contracts, cancellation of works subcontracts, compensation of rental agreements for project office, storage and accommodation, and demobilisation of plants.

23. There are two scenarios after suspension of works contracts: the contracts would either be terminated eventually or the contracts would be resumed after the injection of fresh funding. MTRCL assessed that the additional cost incurred from paragraphs 22(a) to (d) above could be in the region of **$4.8 billion**. MTRCL pointed out that the contractors may take a different view as to their entitlements for the cost of works completed up to the date of suspension and accrued claim entitlements, which would lead to a series of complex, time consuming and expensive disputes, the outcome of which would be very difficult to predict. Further, the above estimate only assumes twelve-month expenditure for maintenance of the unfinished works. It has not taken into account the cost to the Government to continue with the protection of the unfinished works and to look after the equipment procured thereafter until such time when there is a way forward for the XRL project.

24. There are also **indirect costs** involved if the XRL works contracts are suspended, as illustrated below –

(a) the handover of the works sites and areas for the XRL project back to the Government will be delayed, resulting in loss of opportunity associated with the relevant pieces of land. Such pieces of land include notably the one above WKT for topside development, the area of the West Kowloon Cultural District currently occupied by the XRL project as works areas and sites, and the land scheduled to be handed over to Government for the implementation of the proposed Central Kowloon Route;

(b) some existing roads, such as Lin Cheung Road, are now closed to facilitate the construction of the XRL project. Such road closure has led to detour and additional travelling time for road users travelling to that area. If the XRL works contracts are

suspended, the duration of closure would inevitably be lengthened. Similarly, the date of reinstatement of some temporary roads, such as Austin Road West, the alignment of which has been designed to temporary road standard, would be delayed; and

(c) the economic and social benefits to Hong Kong generated by the XRL would be lost.

Termination of Contracts

25. If works are still suspended after 180 days, the contractors may treat it as abandonment. In other words, the contracts would be terminated. There are two scenarios after termination of the XRL contracts –

(a) *Resumption of the XRL project when funding is secured*

Under this scenario, MTRCL will need to arrange new contractors to proceed with the outstanding works. The construction costs would likely escalate due to the possible increase in labour and material costs between the date of termination and date of re-entering of the contracts. Moreover, as the works contracts of unfinished works have been terminated, the warranties of the unfinished works by the relevant contractors will be voided. Even if the Government or the MTRCL can identify subsequent contractors for re-entering the contracts, the new contractors will be expected to drive a hard bargain and will not provide warranties to the Government on the earlier works which are carried out by another contractor. As a result, the subsequent maintenance cost of which the Government is fully liable will likely be much increased. The amount of resumption cost and additional maintenance cost would depend on the waiting period and status of the project when the resumption decision is made upon securing the additional funding. It is anticipated that the amount would be substantial and separate approval from LegCo would have to be

sought for this additional amount of money.

(b) *Abandonment of the XRL project entirely*

Under this scenario, the designs and the unfinished works of the XRL project will become abortive. As of end September 2015, the total expenditure for the XRL project was $55.9 billion. This is yet to reflect the expenditure from September 2015 up until now, and the works that are already committed but not yet paid. The Government would also need to continue with the protection of the unfinished works and look after the equipment procured until there is new initiative with the unfinished works, which are designed for railway use only. If they are to be turned into other uses (e.g. commercial or cultural uses), it is envisaged that the cost will be much higher than if these alternative uses are to be sited elsewhere. More fundamentally, all the potential benefits which the XRL could bring to Hong Kong will be completely lost.

26. In the light of the above, it is imperative for us to provide timely funding to complete the rest of the XRL project which will bring significant benefits to Hong Kong. As reiterated before, the Government will assess MTRCL's obligations regarding project implementation, works delay and project cost overrun, and will reserve all its rights to pursue the warranties and obligations from MTRCL.

WAY FORWARD

27. The MTRCL has advised that the additional funding has to be provided by July 2016 in order to continue with the project. Should it become apparent that no additional funding will be provided, MTRCL has to issue a suspension notice to its contractors <u>in advance</u> in order to keep the total cost (including suspension costs) within the amount allocated by the Government. Based on current cash flow estimate, we have to advise MTRCL some time before July 2016 on whether additional funding can be provided.

28. Subject to the support of the RSC, we plan to seek the endorsement of the LegCo PWSC in December 2015, and then to seek funding approval from the FC in January 2016.

Transport and Housing Bureau
Highways Department
November 2015

Annex A

Review of Revised Programme to Complete for the Hong Kong Section of the Guangzhou-Shenzhen-Hong Kong Express Rail Link

Introduction

This Annex sets out the findings of the review on the MTR Corporation Limited's (MTRCL) revised Programme to Complete ("PTC") for the Hong Kong section of the Guangzhou-Shenzhen-Hong Kong Express Rail Link ("XRL") announced on 30 June 2015. The review was conducted by the Highways Department ("HyD") with the assistance of its monitoring and verification ("M&V") consultant.

Revised PTC

2. The PTC is an integrated project programme which is predicated on the availability of resources, certain commercial settlements and the commitment from all contractors to use their 'best endeavours' to progress and complete the work. The revised PTC indicates **an estimated completion date of third quarter of 2018 ("Q3/2018"), which includes a programme contingency of six months**. In this review of the PTC, MTRCL introduced for the first time for the XRL a Quantitative Schedule Risk Analysis ("QSRA") which is a method of understanding how risks and uncertainties may affect the progress and ultimate completion of a project.

3. The target completion is based on assumed production rates, programme logic and progress up to end May 2015, with six months' programme contingency to deal with future risks and uncertainties. The critical path of the target programme is through the Station Entrance Building ("SEB") in Contract 810A – West Kowloon Terminus ("WKT") Station North. Not all risks and uncertainties are taken into account in the target programme. QSRA was introduced to cater for the remaining risks and uncertainties to identify the confidence level for completing the Project on different completion dates.

Methodology

4. To assess the revised PTC, the M&V Consultant studied the revised programme submitted by MTRCL in detail and verified the critical contracts and works which would affect the project completion. The M&V Consultant also examined the required production rates quoted by MTRCL in achieving the revised PTC to see if they are realistic. Furthermore, the M&V Consultant examined the potential risks and uncertainties identified by MTRCL and verified the effectiveness of those delay mitigation measures being implemented on site.

Quantitative Schedule Risk Analysis

5. The QSRA works by modelling the relevant risks on the XRL programme. According to M&V Consultant's review findings, the risks and uncertainties considered in the QSRA have covered the main critical areas of the project.

6. The QSRA provides an output showing the probability of achieving the XRL completion on or before a certain date. It is common international practice to set the target completion date for a project to one which is associated with a confidence level of 75% to 95%. The QSRA for the XRL shows a confidence level less than 5% of completing the XRL Project in the first quarter of 2018 which is well below the 75% confidence level commonly used. Therefore completion in the first quarter of 2018 is optimistic. It is noted that the **confidence level rises to 75% for completion at the start of Q3/2018** and to **99% for completion at the end of Q3/2018**. The six-month contingency period in the revised PTC was derived on this basis.

7. The QSRA also provides an indication on the risks and uncertainties which have the greatest sensitivity to the completion date. From the result, the most critical risks in the revised PTC are generally related to the roof structure

of the WKT. Therefore, MTRCL should exercise due diligence to manage effectively all of these risks.

Assessment Result

8. Based on the routine monitoring and the review findings of the revised PTC, HyD is of the view that the **Contract 810A**, with its critical paths being the structural concreting and SEB steel roof construction, together with the challenging programme for the follow-on electrical and mechanical ("E&M") and building services works, presents the highest risk of all the XRL contracts to the successful completion for the XRL Project in 2018. Currently, the completion of the SEB is the biggest concern due to the complexity of the structure and the potential emerging risks during its erection. MTRCL has been implementing various measures on site to mitigate the past delays and to enhance production rates of those critical works. With MTRCL's continuous effort to achieve the target production rates for critical works, and timely implementation of effective delay mitigation measures and measures to contain potential risks, it is believed that the target completion date of Q3/2018 could be achieved with high probability as reflected in the QSRA.

9. Due to the delay in tunnel lining works and the unsatisfactory performance of the Tunnel Boring Machines respectively, **Contracts 824** and **826** being tunnel contracts are the next most critical ones even though the progress of the tunnelling works under Contract 826 has become stable.

10. MTRCL has advised that the **E&M programme assumptions in the revised PTC are their own internal estimates based on their knowledge and experience**. The early confirmation by E&M contractors of their ability to meet the timescales for E&M works assumed by MTRCL in the revised PTC is essential for timely completion of the XRL project.

11. To commence operation of the XRL, MTRCL needs to obtain all statutory and other stakeholder consents as necessary, including Mainland

Customs, Immigration and Quarantine facilities. The acceptance by the above third parties, together with the testing and commissioning ("T&C") of the XRL also pose a risk to the XRL Project.

Conclusions

12. The M&V Consultant considers that the revised PTC of Q3/2018 can only be achieved provided that –

(a) Forecast production rates in the revised PTC can be reached and then maintained.

(b) The delays that have already occurred since the revised PTC baseline date of 31 May 2015 can be recovered.

(c) The assumptions that MTRCL has made for the revised PTC, for example on the E&M programmes, are validated by the contractors.

(d) The construction issues of the SEB roof can be resolved and the associated risks managed.

(e) MTRCL proceeds with its negotiations with the critical contractors leading to early commercial settlements[1].

(f) MTRCL can meet the required obligations and solicit timely consents from the Mainland authorities to enable cross-boundary dynamic tests to meet the revised PTC.

(g) MTRCL can obtain all necessary statutory and stakeholder consents for XRL operation.

[1] Due to the significant delay, some contractors have submitted large amount of claims. Assessment and discussion with the contractors on these claims have taken a long time and yet might not come to any agreement. As a way of dispute resolution, commercial settlement will be an option.

(h) MTRCL can demonstrate to the Railways Branch of EMSD that XRL is safe and suitable for the issue of an operating license (after testing and trial running).

(i) None of the contractors issues a termination notice, which would require either re-tendering or negotiating with a new contractor, either of which would be a risk to the revised PTC.

Way forward

13. From the results of the QSRA, MTRCL has identified key risks to the timely completion of the Project. The current monitoring framework of MTRCL should be extended to focus on these key risks. Moreover, MTRCL must validate all E&M programmes with the contractors and T&C programme as soon as possible. MTRCL should also exercise due diligence in obtaining early commercial settlements with the contractors, which are crucial in ensuring that the production rates assumed in the revised PTC can be achieved. MTRCL should complete all its own necessary actions in due course as required for meeting the assumptions of developing the revised PTC. If any of the assumptions are regarded as a risk to the Project, MTRCL should consider including them into the coming regular QSRA as appropriate to facilitate risk monitoring. HyD, assisted by the M&V Consultant, will continue to monitor the project closely with a view to completing the XRL project as early as possible.

Highways Department
November 2015

Review of Revised Cost to Complete for the Hong Kong Section of the Guangzhou-Shenzhen-Hong Kong Express Rail Link

Introduction

This Annex sets out the findings of the review of the MTR Corporation Limited's ("MTRCL") revised Cost to Complete ("CTC") for the Hong Kong section of the Guangzhou-Shenzhen-Hong Kong Express Rail Link ("XRL") announced on 30 June 2015.

Revised Cost to Complete

2. The revised CTC submitted by the MTRCL on 30 June 2015 is $85.3 billion, including a sum of $2.1 billion for contingency.

3. As confirmed by MTRCL, it has adopted a **bottom-up approach** in deriving the revised CTC. The Highways Department ("HyD") and its monitoring and verification ("M&V") consultant has checked the principles and methodology of the cost items based on the bottom-up information provided by MTRCL, including allowances for submitted and future claims, remaining risks and anticipated variations as well as the contingency allowance, in particular about how the $2.1 billion contingency is derived. For example, the validity and principles of submitted claims were reviewed. Methodologies of estimating the allowances for prolongation costs under different contracts and resultant estimates were also checked. Regarding the proposed additional project management cost ("PMC") of MTRCL, the detailed staff structures of different project teams, the associated cost and anticipated expenditure over the coming years are checked.

HyD's and the M&V Consultant's Initial Assessment

4. The M&V Consultant noted that the cost build-ups of revised CTC basically follow the same principles and methodology adopted in the previous

CTC submitted by MTRCL in July 2014. However, the M&V Consultant identified several cost items for which the allowances were considered excessive with room for reduction as follows :

(a) Time-related cost for one quarter

The review finds that build-ups of the revised CTC are based on a target programme for XRL opening in the fourth quarter of 2018 instead of the third quarter of 2018, and all time-related costs, e.g. prolongation, civil attendance and extended defect liability periods, are allowed to meet this target. To tally with the revised PTC for opening in the third quarter of 2018, time-related costs of about **$0.338 billion** for one quarter period should be deducted.

(b) Tender risk allowance

There is an allowance for **$0.08 billion** for tender risk allowance, as part of the contingency of $2.1 billion. Since tender risk allowance is entirely attributed to the Contractor's tender strategy, the associated cost should not be borne by the Employer.

(c) Additional insurance

Due to adjustment of the project outturn costs, the additional insurance, as part of the contingency of $2.1 billion, shall be downward adjusted by about **$0.031 billion** accordingly.

(d) Additional PMC

The top-down review finds that the percentage cost increase under many heads of additional PMC are much higher than the percentage time extension from the original Entrustment Programme to the revised PTC. Since the work nature and establishment of these working teams

should not have been significantly affected by the delayed programme, the excessive cost increase is considered not reasonable. A total reduction of about **$0.728 billion** is proposed on a pro-rata basis.

A summary table showing the above proposed cost reduction items is as follows:

	Description	**Reduction amount ($ billion)**
1.	Time-related cost for one quarter	-0.338
2.	Tender risk allowance	-0.08
3.	Additional insurance	-0.031
4.	Additional PMC	-0.728
	Total:	-1.177

5. On the other hand, the review exercise identified the following missing items which should be covered in the budget –

(a) Finance charge

Finance charge for individual contracts may be taken as valid claims and hence should be allowed with reference to the methodology adopted by MTRCL. The estimated allowance for finance charge is about **$0.007 billion**.

(b) Extension of Excavation Permit

Based on the latest assessment of charge for extension of Excavation Permit for WKT contracts, an additional allowance of **$0.06 billion** should be considered.

(c) Booking adjustment in the estimate

It is noted that some of the estimated amounts have not been properly booked. This amount of **$0.379 billion** should be added back to the estimated cost.

(d) Price escalation for Day 2 platform works[1]

The price escalation for the Day 2 platform works has not been included in the MTRCL's assessment. For budgeting purpose, it is estimated that an additional sum of **$0.5 billion** would be allowed in this regard.

A summary table showing the above proposed cost addition items is as follows:

	Description	**Additional amount ($ billion)**
1.	Finance charge	0.007
2.	Extension of Excavation Permit	0.06

[1] The West Kowloon Terminus ("WKT") is designed with nine tracks for long haul and six tracks for short haul trains. Based on the patronage forecast, it is anticipated that only ten tracks, i.e. six long haul and four short haul tracks will be required when the XRL begins commissioning in 2018. Depending on the growth in patronage, the remaining five tracks ("Day 2 Works") may be required at a later stage. After careful deliberation, we have decided to defer the completion of the Day 2 Works, subject to the growth in patronage after commissioning of the XRL in 2018. The deferral of Day 2 works would avoid incurring unnecessary maintenance cost for platforms and tracks which might not be required during the initial years.

3.	Booking adjustment in the estimate	0.379
4.	Allowance for price escalation for Day 2 platform works	0.5
	Total:	0.946

6. As a result, the M&V Consultant assessed that the net reduction would be **$0.231 billion** (i.e. -$1.177 billion + $0.946 billion).

7. Separately, the West Kowloon Terminus ("WKT") is designed with nine tracks for long haul and six for short haul trains. Based on the patronage forecast, it is anticipated that only ten tracks, i.e. six long haul and four short haul tracks will be required when the XRL begins commissioning in 2018. Depending on patronage growth, the remaining five tracks ("Day 2 Works") may be opened at a later stage. After careful deliberation, the Government affirmed the deferral of the completion of the Day 2 Works to a future date to be reviewed subject to patronage growth after commissioning of the XRL. The deferral of Day 2 works would avoid incurring unnecessary maintenance cost for platforms and tracks which might not be required during the initial years. The cost of the Day 2 Works, amounting to **$0.544 billion**, will be taken out from the current Entrustment Cost of $65 billion. A sum of **$0.036 billion** will also be deducted from the PMC under the Entrustment Agreement ("EA") as the MTRCL is no longer required to complete the Day 2 Works at this moment. Further, the price escalation for the Day 2 platform works (**i.e. $0.5 billion**) as initially assessed by the M&V Consultant (paragraph 5(d) above) can be correspondingly excluded. In sum, the project cost will be reduced by **$1.08 billion**.

8. Having regard to the initial assessment set out in paragraphs 4 to 7 above, HyD and the M&V Consultant considered that the revised CTC could be reduced from $85.3 billion to **$83.989 billion** (i.e. $85.3 billion - $0.231 billion

- $1.08 billion).

Discussion with MTRCL on Revised CTC Review

9. Upon completion of the initial assessment, the Government had several rounds of exchange with MTRCL on HyD's and M&V Consultant's initial review result. Based on further information provided by MTRCL, HyD (with the advice of the M&V Consultant) agreed to adjust the revised CTC as follows –

Reduction Items

10. For the **potential reduction items**, MTRCL agreed with the reduction amounts of the following items –

(a) Time-related cost for one quarter

MTRCL agreed to deduct the time-related costs to tally with the revised PTC for opening in the third quarter of 2018 as set in out paragraph 4(a). This amounts to **$0.338 billion**.

(b) Additional PMC

The top-down review found that the percentage cost increase under many heads of additional PMC were higher than the percentage time extension from the original programme to the revised PTC (54.4% time extension of original programme vs revised programme). Since the work nature and establishment of these working teams should not have been significantly affected by the delayed programme, MTRCL was requested to explain the higher cost increases. By applying a simple across-the-board formula of 54.4%, the additional PMC might be reduced by as much as $0.728 billion as explained in paragraph 4(d). In response to HyD's queries, the Corporation provided further

information to explain that the number of staff in many of their site supervision and contract management teams will have to be increased to enhance the project management. Further resources will have to be deployed for programming, claims assessment, interface management, stakeholder engagement and enhanced reporting, etc. in response to the recommendations made by their Independent Board Committee and the Government-appointed Independent Expert Panel. Following discussion with the Government, the Corporation agreed to reduce the additional PMC by **$0.15 billion**.

(c) Contingency

MTRCL agreed with the reduction of tender risk allowance and additional insurance from the contingency as set out in paragraphs 4(b) and (c). The related amount for these two items is **$0.111 billion**.

MTRCL advised that the contingency comprised further allowance for submitted claims as well as a general contingency. MTRCL clarified that inclusion of a general contingency was considered to be prudent, especially given the uncertainties associated with the current market with very high levels of cost escalation. HyD considered that such inclusion by MTRCL of a general contingency for future unknown claims was not unreasonable. Having said that, given that over 70% of the project has already been completed the estimated project cost should have a greater degree of certainty and the need for a huge sum of contingency might not be necessary. Following discussion with the Government, the Corporation agreed to further reduce the contingency by **$0.147 billion**. The total under Contingency is reduced by **$0.258 billion** to $1.842 billion.

Additional Items

11. After discussion, MTRCL agreed with the proposed additional amounts set out in paragraphs 5 (a) to (c) above. The total sum to be added should be **$0.446 billion**.

Overall

12. Overall, following the careful review by the Government and discussion between the two parties, both sides have agreed that the net adjustment to the revised CTC is **$0.3 billion**. As a result, it is considered reasonable to downward adjust the revised CTC from $85.3 billion to $85.0 billion.

13. After taking out the allowance for the cost of the Day 2 Works (**$0.544 billion**) and PMC required to complete the Day 2 Works (**$0.036 billion**) as mentioned in paragraph 7 above, the total cost-saving is **$0.58 billion**. As a result, the revised CTC can be further reduced to **$84.42 billion**. A summary table showing the reduction in revised CTC is as follows:

(1) Revised CTC Submitted by MTRCL to Government on 30 June 2015		**$85.3 billion**
(2) (a) Net Adjustment		
(i) Reduction of contingency	- $0.258 billion	
(ii) Reduction of time-related costs for one quarter	- $0.338 billion	
(iii) Missing items or items which warrant additional allowance in revised CTC	+ $0.446 billion	
2 (a) [(i) + (ii) + (iii)]		- $0.15 billion

2 (b) Reduction of additional PMC		- $0.15 billion
(3) Cost Saving for Day 2 Works (i) Cost saving for taking out Day 2 Works (ii) Cost saving of PMC for Day 2 Works	- $0.544 billion - $0.036 billion	
(3) [(i) + (ii)]		- $0.58 billion
(4) Total Reduced Amount [2(a) + 2(b) + 3]		- $0.88 billion
Revised CTC [(1) – (4)]		**$84.42 billion**

14. It should be noted that the revised CTC review exercise focused only on the estimate of the cost required to complete the project taking into account, amongst other things, allowance for future project risks and possible claims. The provision of allowance for further project risks and possible claims is considered a sensible budgetary approach. However, if and when any claims are made by Third Party contractors for additional time and/or cost, MTRCL shall, as a competent project manager, critically assess such claims, and **under the EA the onus is on MTRCL to ensure that contractors are granted claims no more than they are contractually entitled to**. Any assessment of any liabilities of MTRCL and its agents to the Government associated with delivery of the XRL project under the XRL EAs has not formed part of this review.

Highways Department

November 2015

Annex C

[DRAFT]

For discussion on XX YY 2015 **PWSC(2015-16)XX**

ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

HEAD 706 – HIGHWAYS
Transport – Railways
53TR – Hong Kong Section of Guangzhou – Shenzhen – Hong Kong Express Rail Link – construction of railway works

Members are invited to recommend to the Finance Committee to amend the project scope and increase the approved project estimate of **53TR** by $15,387.5 million from $55,017.5 million to $70,405 million in money-of-the-day prices.

PROBLEM

The approved project estimate (APE) of **53TR** (the Project) is not sufficient to cover the cost of works under the Project.

PROPOSAL

2. The Director of Highways, with the support of the Secretary for Transport and Housing, proposes to increase the APE for **53TR** by $15,387.5 million from $55,017.5 million to $70,405 million in money-of-the-day (MOD) prices.

PROJECT SCOPE AND NATURE

3. In January 2010, the Finance Committee (FC) of the Legislative Council approved the upgrading of **53TR** to Category (Cat) A at an estimated cost of $55,017.5 million in MOD prices. The approved scope of **53TR** comprises -

(a) construction of the railway works for the Hong Kong section of the Guangzhou – Shenzhen – Hong Kong Express Rail Link (XRL), which include –

(i) railway facilities at the West Kowloon Terminus (WKT), including station concourse, passenger waiting areas, platforms, control and signal systems, etc.;

(ii) approximately 26 kilometre long tunnel from WKT to the boundary at Huanggang;

(iii) a below-ground emergency rescue siding and at-grade stabling sidings in Shek Kong with necessary facilities to provide emergency rescue, passenger evacuation, as well as maintenance of rolling stock and infrastructure; and

(iv) eight ventilation buildings, one emergency access point and the associated ventilation shafts and adits or accesses for the tunnel.

(b) procurement of rolling stock, railway systems, as well as safety, operation and maintenance equipment; and

(c) fees for consultants appointed by the Government for monitoring and vetting the work of the MTR Corporation Limited (MTRCL) relating to the railway works under the XRL.

The scope of **53TR** is proposed to be expanded to include other consultancy services for the XRL project, such as litigation services for handling the MTRCL culpability issues, financial consultant to vet MTRCL's proposal on the service concession, etc. On the other hand, Day 2 Works and the related Project Management Cost (PMC) will be taken out from the scope of **53TR** (see paragraph 36 below). The plan showing the proposed alignment of the XRL attached to the previous FC submission is at **Enclosure 1**.

4. In conjunction with the funding application of **53TR** in January 2010, the FC also approved the upgrading of **57TR** to Cat A at an estimated cost of $11,800 million in MOD prices for the construction of non-railway works of the XRL. The APE for the construction of the entire XRL project is $66.817.5 million in the MOD prices. A breakdown is as follows–

	Project	**Estimate ($ million) (in September 2009 prices)**	**Estimate ($ million) (in MOD prices)**
(1)	**53TR** construction of railway works	51,416.5	55,017.5
(2)	**57TR** construction of non-railway works	11,027.6	11,800.0
	Total construction cost	**62,444.1**	**66,817.5**

ENTRUSTMENT TO THE MTRCL

5. On 22 April 2008, the Executive Council decided that the XRL would be undertaken under the concession approach[1]. Thereafter, the Government and the MTRCL entered into an Entrustment Agreement for entrusting the construction, testing and commissioning of the XRL to the latter at the Project Control Total (PCT) of $65,000 million in MOD prices. The remaining fund of $1,817.5 million, which is under the management of the Highways Department (HyD) under the APEs of **53TR** and **57TR**, is the budget for the construction and provision of government facilities or equipment, consultancy for monitoring and verification (M&V) services etc. As set out in the Public Works Subcommittee (PWSC) paper PWSC(2009-10)68 and PWSC(2009-10)69, the target commissioning date of the XRL project would be 2015.

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[1] Under the concession approach, the construction of the XRL will be funded by the Government under the Public Works Programme. The MTRCL has been entrusted with the design, construction, testing and commissioning of the XRL. Upon completion of the railway, MTRCL would be granted a service concession for the operation, and the Government would receive service concession payment.

PROGRESS OF THE PROJECT

6. The MTRCL first notified the Government in April 2014 that the commissioning target of the XRL project would be delayed and confirmed in May 2014 that the revised PTC with commissioning of the XRL by end 2017. In August 2014, the MTRCL announced that its revised Cost to Complete (CTC) for the XRL project would be $71.52 billion. Based on the information provided by the MTRCL at that time, HyD, with the assistance of its M&V consultant, completed the assessment of MTRCL's revised CTC and urged the MTRCL, in November 2014, to review again the revised CTC in the light of HyD's review findings and the reports of the MTRCL's Independent Board Committee, and to advise on how the issues in the revised CTC would be addressed.

7. On 30 June 2015, the MTRCL notified the Government of its latest review results regarding the revised Programme to Complete (PTC) and revised CTC of the XRL project. The commissioning target of the XRL would have to be delayed further to the third quarter of 2018, which includes a six-month contingency period. As regards the CTC, the MTRCL advised that the amount would have to be revised to $85.3 billion, which included a sum of $2.1 billion for contingency.

8. As at the end of September 2015, the overall progress of the XRL project was 73.7%. The overall tunnel excavation was 99% complete with about 430m remaining. Installation works were underway for the rail tracks, overhead lines, signaling systems and telecommunications systems inside the tunnels. The WKT was 57% completed. Blasting at Level B4 of the Terminus north-top-down area was making good progress and achieving the target rates. The overall excavation of the Terminus was 95% completed, whilst 63% of the concrete structure had been cast. In parallel, the erection of the permanent steel members of the roof structure was about 32% completed.

JUSTIFICATION

9. The Government has grave concern about the severe delay and cost overrun of the XRL project. HyD, assisted by its M&V consultant, has critically scrutinized the latest revised CTC submitted by the MTRCL and the impact on the financial position of the **53TR** and **57TR**.

10. Following the assessment by HyD and its M&V consultant and subsequent discussions with the MTRCL, the Government (on the advice of the M&V Consultant) has agreed that the net adjustment to the revised CTC should be $880 million, bringing down the revised CTC submitted by the MTRCL on 30 June 2015 from $85.3 billion to $84.42 billion. Apart from this, the Government costs will also have to be increased by $0.1825 billion[2] to cover additional costs including M&V consultancy services and other studies due to delayed completion. On this basis, it will be necessary to increase the APE of **53TR** by $15,387.5 million from $55,017.5 million to **$70,405 million (in MOD prices)** and that of **57TR** by $4,215 million from $11,800 million to **$16,015 million (in MOD prices)**. The total increase in APE for **53TR** and **57TR** is $19,602.5 million. Based on MTRCL's explanation, as supplemented by the verification of HyD and its M&V Consultant, the additional costs arise mainly from the following –

(a) unfavourable ground conditions;

(b) disruption due to other causes;

(c) changes in design to suit actual site conditions and various unforeseen circumstances;

(d) price escalations;

(e) additional PMC and insurance;

(f) further contingency for the remaining works;

(g) additional government cost; and

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[2] Government costs include cost allowances for engaging M&V Consultants, financial consultant and other consultancy studies, as well as provision of government facilities, such as equipment for boundary control facilities at West Kowloon Terminus, etc.

minus (h) the removal of Day 2 Works and associated PMC.

11. Separate additional funding application will be made for **57TR** (PWSC(2015-16)XX). Details of the proposed increase in the APE of **53TR**, which is the subject of this paper, are elaborated in paragraphs 12 to 36 below.

(a) Unfavourable ground conditions

12. Unfavourable ground conditions, with some being unforeseen, is a common primary cause of progress delay and cost overrun for the XRL project, affecting the whole spectrum of works, including diaphragm wall construction and open excavation at WKT and Approach Tunnels, Tunnel Boring Machine (TBM) tunnelling and drill-and-blast tunnelling.

13. At WKT, the construction of the diaphragm walls were one of the first major works to be undertaken, but its completion was delayed for more than a year because of the discovery of extensive utilities and unforeseen ground conditions including uncharted large boulders, corestones and uneven bedrock. Utilities were required to be decommissioned, slewed or diverted with interfaces among the utility companies. The total volume of the diaphragm wall inside the rock head levels also had to be increased by about 400 cubic metres, i.e. more than four times of the planned volume, due to the above unfavourable ground conditions. The presence of boulders and breakwater obstructions also hampered the progress of works. Further, excessive movement on the diaphragm wall caused by the unfavourable ground had been recorded. The MTRCL had instructed the contractor to carry out grouting works around the diaphragm wall to strengthen the soil and prevent further movement that as a result delayed the excavation works thereafter.

14. The progress of excavation of the Approach Tunnel Areas north to the WKT was hindered by the presence of large boulders and uncharted utilities that had to be negotiated with the utility companies during the excavation process. The delay in the construction of diaphragm wall of WKT and excavation at Approach Tunnel Areas had a knock-on effect on the progress of the subsequent and adjacent works at WKT, which were implemented under

tightly interfaced contracts. As a result, the award of the contract for the main station works of WKT was delayed by about **ten and a half months** compared to original plan.

15. The commencement of excavation at WKT was delayed by the above adverse ground condition. The high underground rock stratum necessitated the excavation of about 94,000 cubic metres of rock mass, which was about the volume of 35 Olympic-sized swimming pools. Coupled with various site constraints, despite mobilisation of additional excavation plants and even change of mechanical breaking to a combination of drill-and-blast and mechanical excavation, there was about **eight months overall programme delay** in excavation and hence knock-on delay of the subsequent structural and concreting works of the terminus structure.

16. At the urban tunnel section, the progress of the TBM tunnelling works was affected by the discovery of unchartered H-piles and steel pieces along the alignment. Some of these piles and steel pieces were difficult to pull out from the ground surface due to existing traffic. Much grouting and engineering works were required to remove these H-piles before the TBM works could resume, thus affecting the tunnelling works progress by about **seven months**.

17. The progress of the rural tunnel section was affected by the high underground water table and unfavourable ground condition encountered. Large volume of groundwater ingress was recorded in the drill-and-blasting tunnel section. Additional grouting works were required to control the groundwater ingress and strengthen the soil around the tunnel. The progress of the drill-and-blast works was therefore affected.

18. The above unfavourable ground conditions contribute to a cost increase of **$3,647 million**, which is **about 23.7%** of the proposed increase in APE, due to a slower rate of construction, higher construction risk, additional works to remove the unchartered obstructions, more wear and tear problem associated with the operation of TBM and additional grouting work.

(b) Disruption due to other causes

19. Due to the unfavourable ground condition encountered, the progress of the construction of diaphragm wall at WKT was adversely delayed. It had a knock-on delay on the progress of the subsequent works at WKT under different contracts. For example, delay in diaphragm walls construction under Contract 811B – WKT Approach Tunnel – South led to a decision to divert a section of Jordan Road southward onto the north top-down area within Contract 810A – WKT Station North as a delay recovery measure. However, subsequent delays in Contract 811B had a knock-on effect on the handing over of the occupied north top-down area to Contract 810A for its construction works there. The productivity of Contract 810A was thus limited by the available space for excavation works.

20. For the cross-boundary tunnel section, the down track and up track tunnels were constructed by two TBM drives launching from Huanggang, Shenzhen to Mai Po, Hong Kong. The TBM drives started in Huanggang by the Mainland contractor. Only upon reaching the boundary would the TBM tunnelling works come under the management and supervision of the Hong Kong contractor. Because of the complex geology and construction difficulties encountered on Shenzhen side, both down track and up track TBMs arrived at the Hong Kong boundary about **14.5 months later** than originally scheduled; as a result, this increased the outturn cost of remaining section of the tunnels on Hong Kong side. The tunnelling works were also delayed due to frequent repair and maintenance of the TBMs required, which were further complicated by the presence of fishponds at Mai Po above the proposed tunnel.

21. Due to the slippage of the progress in the civil contracts, the progress of the electrical and mechanical (E&M) works were delayed and constrained by limited access available to the E&M contractors from the civil contractors. Furthermore, the contractors were required to complete their works under a tight programme to achieve the revised PTC. As a result, the contractors had to deploy additional labour and plants to complete the works.

22. We estimate that the disruption due to other causes have led to an additional cost of **$3,561 million**, which is **about 23.1%** of the proposed increase.

(c) Changes in design to suit actual site conditions and various unforeseen circumstances

23. It is common and often times unavoidable for a major underground infrastructure project to have variations and enhancement in the construction methodologies and works during the construction stage to suit the actual site conditions and various unforeseen circumstances, thereby causing design changes. The XRL project is no exception.

24. The WKT will encroach into the underground area of the West Kowloon Culture District (WKCD). The structure of WKT will integrate and have direct interfaces with the WKCD facilities. Since the design of WKCD facilities was only completed after the commencement of the construction of WKT, changes to the design of WKT was required to accommodate the requirement of WKCD. For example, the slab of basement first floor of WKT was re-designed to suit the WKCD facilities, which resulted in changes in the sizes of WKT structure members.

25. Further, it was recorded that there have been numerous design changes on WKT issued by the MTRCL. There have been more than 350 Engineer Instructions including more than 13 000 revised drawings and 1 590 Requests for Information. The significant number of changes has caused disruption of works and delay to the overall progress.

26. There were also commercial disputes (now resolved) between the main contractor and subcontractor of the WKT on the steel roof erection works which caused significant delays to the preparation of the shop drawings and part drawings of the structural steelworks. This subsequently affected the progress of both the fabrication and erection of the temporary and permanent steelworks.

27. For the rural tunnel section, the design of the drill-and-blast tunnel was revised to cater for the high underground water table and large volume of groundwater ingress encountered during construction.

28. Based on the factors mentioned in paragraphs 23 – 27 above, we estimate that the changes in design has contributed to an increase of **$1,591 million**, which accounts for **about 10.3%** of the proposed increase.

(d) Price escalations

29. When the Government applied for the funding for **53TR** and **57TR** in January 2010, the cost estimate was based on the market situation and data available up to early 2009 by making reference to the cost information of similar infrastructure projects. Since then, there has been a surge in the construction prices, in particular for certain civil engineering works such as tunnelling and excavation, leading to the higher-than-expected unit prices of the Project. At the time of the estimate in early 2009, the forecast of the rate of change in the prices of public sector building and construction output was 2% per annum from 2009 to 2013 and 3% per annum from 2014 onwards. However, the actual cost escalation rate has been much higher for each year since 2009, ranging from 2.9% to 6.8% per annum.

30. Local labour costs have become more volatile since late 2009. Based on the relevant wages information from the Census and Statistics Department, the composite labour wages for civil engineering and building works increased by about 48% and 59% from December 2009 to February 2015. Furthermore, workers of the project often have to work underground or inside tunnel. The working environment is very tough compared to the other major infrastructure projects above ground. Workers have ample choice of job opportunities, and underground tunnelling works are less attractive to them. As a result, contractors have to pay workers at a considerable premium.

31. Due to the reasons mentioned in paragraphs 12 – 28 above, the XRL project has been significantly delayed. Coupled with the heated construction industry and price escalation, the construction cost has increased significantly over the past few years, which was not adequately allowed for in the current budget. The accrued delays, and hence a longer construction period, have also aggravated the situation. Claims have been received in this regard. It is considered appropriate to make provision for the increase in project cost arising from price escalation. Based on the latest project estimate, the provision for price escalation has to be increased by **about $3,096 million**, contributing **about 20.1%** of the proposed total increase.

(e) Additional PMC and insurance

32. MTRCL's PMC for the XRL project includes staff and corporate costs for the project team and project headquarters team, as well as other support services for the teams. The project team is responsible for project planning and management, as well as supervision of construction activities. The project headquarters team provides support for project control, planning and programming, procurement, and contract administration etc., while support services cover human resources, legal services, public relations, finance and information technology etc. With the extended construction period of the XRL project, additional PMC of 1,790 million for the project is required for the additional expenses on the staff, accommodation and corporate costs for the MTRCL project team and project headquarters team, as well as other support services. The additional PMC cost under **53TR** is **$1,445 million**, contributing **about 9.4%** of the proposed increase.

33. Additional insurance of $912 million for the entire project is required for increased insurance coverage due to extended construction period and increase cost of works. The additional insurance cost under **53TR** is **739 million**, contributing **about 4.8%** of the proposed increase.

(f) Further contingency for the remaining works

34. Due to the aforementioned reasons, the contingency approved under the APE has already been committed to offset the accrued increase in the cost of works. In the light of continuous challenges and risks which may arise as a result of past or future risk events, a further contingency amount of total $1,842 million for the remaining works under XRL project is allowed in the proposed increase to provide additional cost certainty. It mostly covers further allowance for claims upon substantiation, and allowance for uncertainty associated with the current heated construction market with high cost escalation. The further contingency for the remaining works under **53TR** is **$1,786 million** contributing **about 11.6%** of the proposed increase.

(g) Additional Government cost

35. The increase in Government costs is to cover the expanded scope of works for the M&V consultancy services and other studies over the extended construction period, namely the litigation services for handling the MTRCL culpability issues, financial consultant to vet MTRCL's proposal on the service concession and other studies. The additional Government cost under **53TR** is **$102.5 million** contributing **about 0.7%** of the proposed increase.

(h) Removal of Day 2 Works and associated PMC

36. The WKT is designed with nine tracks for long haul and six for short haul trains. Based on the patronage forecast, it is anticipated that only ten tracks, i.e. six long haul and four short haul tracks, will be required when the XRL begins commissioning in 2018. Depending on patronage growth, the remaining five tracks ("Day 2 Works") may be opened at a later stage. After careful deliberation, the Government affirmed the deferral of the completion of the Day 2 Works, to a further date to be reviewed, subject to the patronage growth after commissioning of the XRL. The deferral of Day 2 works would avoid incurring unnecessary maintenance cost for platforms and tracks which might not be required during the initial years. The cost of the Day 2 Works, amounting to $544 million, will be taken out from the current PCT of $65 billion. A sum of $36 million will also be deducted from the PMC under the Entrustment Agreement as the MTRCL is no longer required to complete the Day 2 Works at this moment. The total cost-saving for taking out Day 2 Works is **$580 million**, which has been taken into account in the current application for increase in APE described in paragraphs above.

OTHER OPTIONS

37. We understand that there are some suggestions to simply suspend or even terminate the XRL contracts. The consequences of such a scenario, if materialised, are grave and must not be under-estimated.

Suspension of Contracts

38. According to a rough assessment by the HyD and MTRCL, the consequences if works had to be stopped because of lack of funding will be catastrophic. There will be huge additional **direct costs** associated with the suspension (not to mention termination) of the XRL contracts arising from the following areas:

(a) when the works contracts are suspended (or even terminated), the contractors are bound to submit monetary claims due to loss of profits and other expenses as a result. Although the contracts under XRL project are signed between MTRCL and the contractors, Government has entered into a deed poll with each of the contractors. These deeds provide that the contractors are liable to Government as if the Government and MTRCL are jointly named as the employer of the contracts, and vice versa. Hence, there are significant legal ramifications for the Government should the XRL works contracts be suspended (or terminated);

(b) during the suspension period, there will be costs including keeping essential staff and plants as well as arranging regular maintenance and inspection for the unfinished civil and electrical and mechanical works until the final termination of all the contracts;

(c) all unfinished works, tunnels and works sites, in particular the huge opening at WKT, would need to be secured and protected to ensure safety of the sites and adjoining properties. There would also be a need to upkeep the temporary traffic management schemes being implemented and monitoring of ground water to address safety concerns; and

(d) if the works contracts were eventually terminated, there would be costs associated with termination of employment contracts, cancellation of

works subcontracts, compensation of rental agreements for project office, storage and accommodation, and demobilisation of plants.

39. There are two scenarios after suspension of works contracts. The contracts would either be terminated eventually or the contracts would be resumed after the injection of fresh funding. MTRCL assessed that the additional cost incurred from paragraphs 38(a) to (d) above could be in the region of **$4.8 billion**. MTRCL pointed out that the contractors may take a different view as to their entitlements for the cost of works completed up to the date of suspension and accrued claim entitlements, which would lead to a series of complex, time consuming and expensive disputes, the outcome of which would be very difficult to predict. Further, the above estimate only assumes twelve-month expenditure for maintenance of the unfinished works. It has not taken into account the cost to the Government to continue with the protection of the unfinished works and to look after the equipment procured thereafter until such time when there is a way forward for the XRL project.

40. There are also **indirect costs** involved if the XRL works contracts are suspended, as illustrated below:

(a) the handover of the works sites and areas for the XRL project back to the Government will be delayed, resulting in opportunity costs associated with the relevant pieces of land. Such pieces of land include notably the one above WKT for topside development, the area of the WKCD currently occupied by the XRL project as works areas and sites, and the land scheduled to be handed over to Government for the implementation of the proposed Central Kowloon Route;

(b) some existing roads, such as Lin Cheung Road, are now closed to facilitate the construction of the XRL project. Such road closure has led to detour and additional travelling time for road users travelling to that area. If the XRL works contracts are suspended, the duration of closure would inevitably be lengthened. Similarly, the date of reinstatement of some temporary roads, such as Austin Road West, the alignment of which has been designed to temporary road standard, would be delayed; and

(c) the economic and social benefits to Hong Kong generated by the XRL would be lost.

Termination of Contracts

41. If the works are still suspended after 180 days, the contractors may treat it as abandonment. In other words, the contracts would be terminated. There are two scenarios after termination of the XRL contracts –

(a) resumption of the XRL project when funding is secured

Under this scenario, MTRCL will need to arrange new contractors to proceed with the outstanding works. The construction costs would likely escalate due to the possible increase in labour and material costs between the date of termination and date of re-entering of the contracts. Moreover, as the works contracts of unfinished works have been terminated, the warranties of the unfinished works by the relevant contractors will be voided. Even if the Government or the MTRCL can identify subsequent contractors for re-entering the contracts, the new contractors will be expected to drive a hard bargain and will not provide warranties to the Government on the works which were carried out by another contractor. As a result, the subsequent maintenance cost of which the Government is fully liable to will likely be much increased. The amount of resumption cost and additional maintenance cost would depend on the waiting period and status of the project when the resumption decision is made upon securing the additional funding. It is anticipated that the amount would be substantial and separate approval from LegCo would have to be sought for this additional amount of money.

(b) abandonment of the XRL project entirely

Under this scenario, the designs and the unfinished works of the XRL project will become abortive. As of end September 2015, the total

expenditure for the XRL project was $55.9 billion. This is yet to reflect the expenditure from September 2015 up until now, and the works that are already committed but not yet paid. The Government would also need to continue with the protection of the unfinished works and incur additional cost for maintenance of the procured facilities until there is new initiative with the unfinished works, which are designed for railway use only. If they are to be turned into other uses (e.g. commercial or cultural uses), it is envisaged that the cost will be much higher than if these alternative uses are to be sited elsewhere. More fundamentally, all the potential benefits which the XRL could bring to Hong Kong will be completely lost.

LIABILITIES

42. The Government deeply regrets the severe delay in, and the substantial cost overrun of, the XRL project. As the Government has publicly stated before, it will ascertain the liabilities of the parties concerned and will reserve all the rights to pursue the warranties and obligations from MTRCL regarding project implementation, works delay and project cost overrun. The process of establishing a case against any particular party, be it MTRCL or any of its agents, is expected to be protracted. In the meantime, we must not lose sight of the fact that the XRL is a major transport infrastructure which will bring significant benefits to Hong Kong. It is imperative for us to provide timely funding to complete the rest of the XRL project.

SUMMARY OF FINANCIAL POSITION

43. A breakdown of the proposed increase of $15,387.5 million is as follows –

	Factors	**Proposed increased amount (in MOD prices) ($ million)**	**Percentage of the increased amount (%)**
	Increase due to -		

(a)	Unfavourable ground conditions	3,647.0	23.7%
(b)	Disruption due to other causes	3,561.0	23.1%
(c)	Changes in design to suit actual site conditions and various unforeseen circumstances	1,591.0	10.3%
(d)	Price escalations	3,096.0	20.1%
(e)	Additional PMC and insurance	2,184.0	14.2%
(f)	Further contingency for the remaining works	1,786.0	11.6%
(g)	Additional government cost	102.5	0.7%
(h)	Minus: Removal of Day 2 Works and associated PMC	(580)	-3.7%
(i)	Proposed increase (i)=(a) to (h)	15,387.5	100%

FINANCIAL IMPLICATIONS

44. Subject to funding approval, we will revise the phased expenditure as follows–

Year	$ million (in MOD prices)
Up to March 2015	43,245.81
2015-2016	6,117.01
2016-2017	5,654.68
2017-2018	5,400.00
2018-2019	5,300.00
2019-2020	3,750.00
2020-2021	937.50
Total	**70,405.0**

45. The proposed increase in the APE will not give rise to any additional recurrent expenditure.

PUBLIC CONSULTATION

46. We will consult the RSC of the Legislative Council on the proposed increase in APE for the **53TR** and **57TR** on 4 December 2015.

BACKGROUND INFORMATION

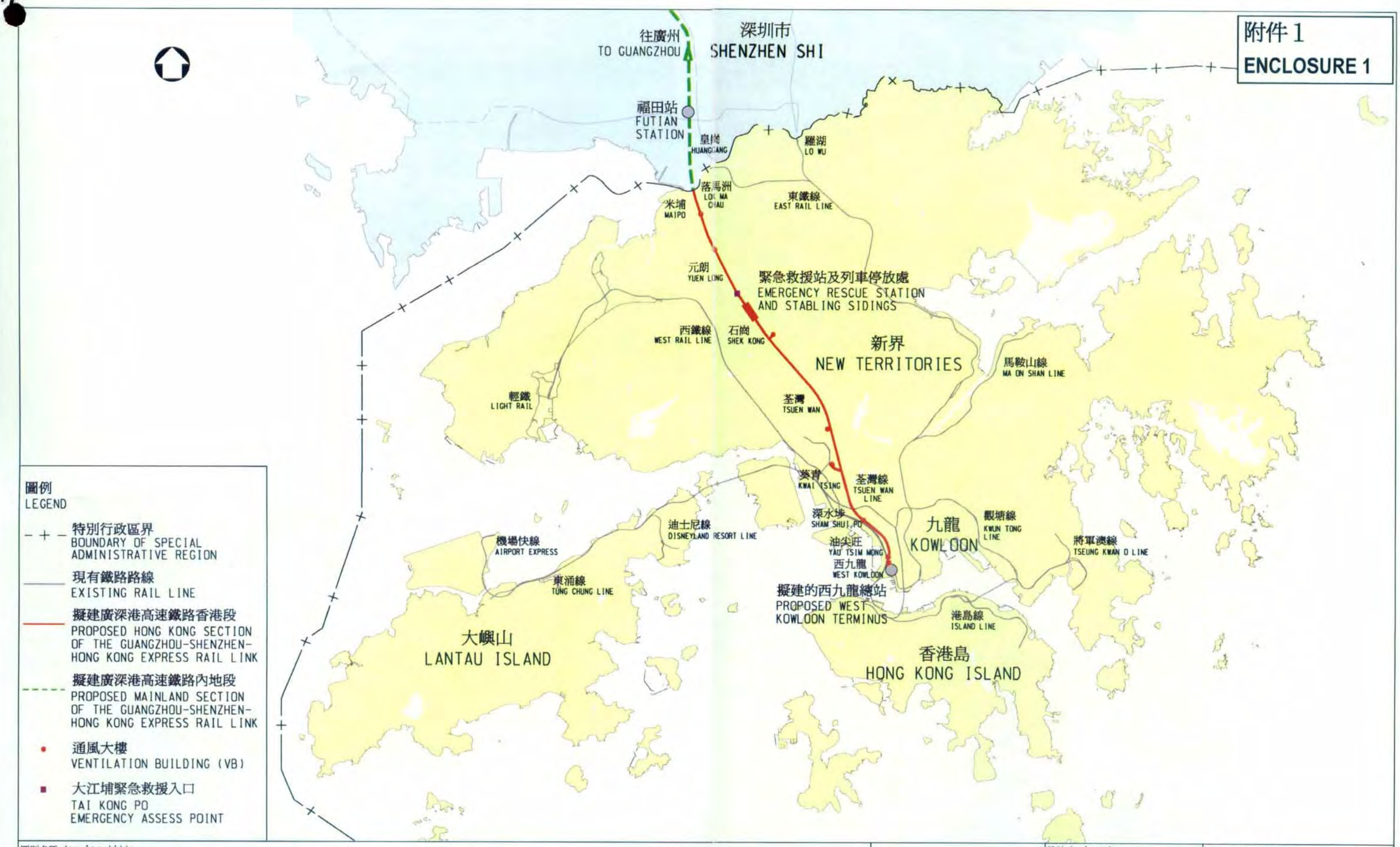
47. The FC approved the upgrading of **53TR** to Cat A in January 2010 at an estimated cost of $55,017.5 million in MOD prices. The Legislative Council has been kept informed of the progress of the project, including delays and the

reasons for these, delay recovery measures undertaken, as well as cost implications.

48. The proposed increase in the APE will not involve the creation of any additional professional and technical posts or job opportunities.

Transport and Housing Bureau
November 2015

附件 1
ENCLOSURE 1



圖例
LEGEND

- 特別行政區界
  BOUNDARY OF SPECIAL ADMINISTRATIVE REGION
- 現有鐵路路線
  EXISTING RAIL LINE
- 擬建廣深港高速鐵路香港段
  PROPOSED HONG KONG SECTION OF THE GUANGZHOU-SHENZHEN-HONG KONG EXPRESS RAIL LINK
- 擬建廣深港高速鐵路內地段
  PROPOSED MAINLAND SECTION OF THE GUANGZHOU-SHENZHEN-HONG KONG EXPRESS RAIL LINK
- 通風大樓
  VENTILATION BUILDING (VB)
- 大江埔緊急救援入口
  TAI KONG PO EMERGENCY ASSESS POINT

圖則名稱 drawing title
工務計劃項目第53TR號
廣深港高速鐵路香港段 — 鐵路建造工程
香港段位置圖
PWP ITEM NO. 53TR
HONG KONG SECTION OF GUANGZHOU-SHENZHEN-HONG KONG EXPRESS RAIL LINK – CONSTRUCTION OF RAILWAY WORKS
LOCATION PLAN OF HONG KONG SECTION

S. H. LAM
總工程師 CHIEF ENGINEER
23/11/09
日期 DATE

設計 designed K. K. LEI 23/11/09
繪圖 drawn Y. L. MA 23/11/09
核對 checked K. K. LEI 23/11/09
核准 approved C. W. YUNG 23/11/09

圖號 drawing no.
HRWXRL002-SP0009

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鐵路拓展處 RAILWAY DEVELOPMENT OFFICE
路政署 HIGHWAYS DEPARTMENT

A3 297X420

Annex D

[DRAFT]

For discussion
on XX YY 2015

PWSC(2015-16)XX

ITEM FOR PUBLIC WORKS SUBCOMMITTEE
OF FINANCE COMMITTEE

HEAD 706 – HIGHWAYS
Transport – Railways
57TR – Hong Kong Section of Guangzhou – Shenzhen – Hong Kong Express Rail Link – construction of non-railway works

Members are invited to recommend to the Finance Committee to amend the project scope and increase the approved project estimate of **57TR** by $4,215 million from $11,800 million to $16,015 million in money-of-the-day prices.

PROBLEM

The approved project estimate (APE) of **57TR** (the Project) is not sufficient to cover the cost of works under the Project.

PROPOSAL

2. The Director of Highways, with the support of the Secretary for Transport and Housing, proposes to increase the APE for **57TR** by $4,215 million from $11,800 million to $16,015 million in money-of-the-day (MOD) prices.

PROJECT SCOPE AND NATURE

3. In January 2010, the Finance Committee (FC) of the Legislative Council (LegCo) approved the upgrading of **57TR** to Category (Cat) A at an estimated cost of $11,800 million in MOD prices. The approved scope of **57TR** comprises -

(a) construction of essential public infrastructure works (EPIW) including –

(i) three footbridges linking to the Kowloon Station, two footbridges linking to the Austin Station, a footbridge linking to the public transport interchange at the north of Jordan Road and a footbridge above new Road D1A near Man Cheong Street;

(ii) two subways linking to the Austin Station and the footpath located at west of Lin Cheung Road;

(iii) construction of a depressed road system and associated at-grade roads and noise barriers or enclosures at Austin Road West and Lin Cheung Road; and

(iv) construction of new Road D1A and reconstruction of Wui Man Road and erection of associated noise barriers or enclosures.

(b) construction of the "reprovisioning, remedial and improvement works" (RRIW);

(c) construction of the enabling works –

(i) for the topside property development at Site A[1] (i.e. the site on top of WKT);

(ii) for the future West Kowloon Cultural District (WKCD) development above West Kowloon Terminus (WKT); and

(iii) for the future footbridges at Sham Mong Road;

(d) construction and provision of government facilities or equipment at the WKT including the boundary control facilities (BCF), special firefighting equipment for use in the Hong Kong section of the Guangzhou – Shenzhen – Hong Kong Express Rail Link (XRL) tunnel during the construction and operation phases and the other associated equipment; and

(e) fees for consultants appointed by the Government for monitoring and vetting the work of the MTR Corporation Limited (MTRCL) relating to the EPIW, RRIW, enabling works and the concerned government facilities or equipment.

The scope of **57TR** is proposed to be expanded to include other consultancy services for the XRL project. The list of EPIW, RRIW and enabling works, together with the respective drawings attached to the previous submission, are at **Enclosures 1, 2 and 3** respectively.

4. In conjunction with the funding application of **57TR** in January 2010, the FC also approved the upgrading of **53TR** to Cat A at an estimated cost of $55,017.5 million in MOD prices for the construction of railway works of the XRL. The APE for the construction of the entire XRL project is $66.817.5 million in the MOD prices. A breakdown is as follows –

	Project	**Estimate ($ million) (in September 2009**	**Estimate ($ million) (in MOD prices)**

[1] The site was zoned as Comprehensive Development Area (1) on the draft South West Kowloon Outline Zoning Plan No. S/K20/22A on top of the WKT for non-railway development.

		prices)	
(1)	**53TR** construction of railway works	51,416.5	55,017.5
(2)	**57TR** construction of non-railway works	11,027.6	11,800.0
	Total construction cost	**62,444.1**	**66,817.5**

ENTRUSTMENT TO THE MTRCL

5. On 22 April 2008, the Executive Council decided that the XRL would be undertaken under the concession approach[2]. Thereafter, the Government and the MTRCL entered into an Entrustment Agreement for entrusting the construction, testing and commissioning of the XRL to the latter at the Project Control Total (PCT) of $65,000 million in MOD prices. The remaining fund of $1,817.5 million, which is under the management of the Highways Department (HyD), under the APEs of **53TR** and **57TR** is the budget for the construction and provision of government facilities or equipment and consultancy for monitoring and verification (M&V) services, etc. As set out in the Public Works Subcommittee (PWSC) paper PWSC(2009-10)68 and PWSC(2009-10)69, the target commissioning date of the XRL project would be 2015.

PROGRESS OF THE PROJECT

6. The MTRCL first notified the Government in April 2014 that the commissioning target of the Hong Kong section of XRL project would be delayed and confirmed in May 2014 that the revised PTC with commissioning of the XRL by end 2017. In August 2014, the MTRCL announced that its revised Cost to Complete (CTC) for the XRL project would be $71.52 billion. Based on the information provided by the MTRCL at that time, HyD, with the

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[2] Under the concession approach, the construction of the XRL will be funded by the Government under the Public Works Programme. The MTRCL has been entrusted with the design, construction, testing and commissioning of the XRL. Upon completion of the railway, MTRCL would be granted a service concession for the operation, and the Government would receive service concession payment.

assistance of its M&V consultant, completed the assessment of MTRCL's revised CTC and urged the MTRCL, in November 2014, to review again the revised CTC in the light of HyD's review findings and the reports of the MTRCL's Independent Board Committee, and to advise on how the issues in the revised CTC would be addressed.

7. On 30 June 2015, the MTRCL notified the Government of its latest review results regarding the revised Programme to Complete (PTC) and revised CTC of the XRL project. The commissioning target of the XRL would have to be delayed further to the third quarter of 2018, which included a six-month contingency period. As regards the CTC, the MTRCL advised that the amount would have to be revised to $85.3 billion, which included a sum of $2.1 billion for contingency.

8. As at the end of September 2015, the overall progress of the XRL project was 73.7%. The overall tunnel excavation was 99% complete. Installation works were underway for the rail tracks, overhead lines, signalling systems and telecommunications systems inside the tunnels. The WKT was 57% completed, with the overall excavation 95% completed and the concrete structure 63% cast.

9. The construction of the non-railway works under **57TR** commenced in tandem with the railway works under **53TR**. The RRIW along the tunnel alignment and the enabling works on Sham Mong Road were substantially completed. The EPIW and enabling works at West Kowloon, including the enabling works for Site A and WKCD, were constructed in pace with the construction of WKT station structure. The seven footbridges and two subways at West Kowloon would be constructed at the later stage to tie in with the progress of the railway works thereby.

JUSTIFICATION

10. The Government has grave concern about the severe delay and cost overrun of the XRL project. HyD, assisted by its M&V consultant, has critically scrutinized the latest revised CTC submitted by the MTRCL and the impact on the financial position of the **53TR** and **57TR**.

11. Following the assessment by HyD and its M&V consultant and subsequent discussions with the MTRCL, the Government (on the advice of the M&V Consultant) has agreed that the net adjustment to the revised CTC should be $880 million, bringing down the revised CTC submitted by the MTRCL on 30 June 2015 from $85.3 billion to $84.42 billion. Apart from this, the Government costs will also have to be increased by $0.1825 billion[3] to cover additional costs including M&V consultancy services and other studies due to delayed completion. On this basis, it will be necessary, to increase the APE of **53TR** by $15,387.5 million from $55,017.5 million to **$70,405 million (in MOD prices)** and that of **57TR** by $4,215 million from $11,800 million to **$16,015 million (in MOD prices)**. Based on MTRCL's explanation, as supplemented by the verification of HyD and its M&V Consultant, the additional costs arise mainly from the following –

(a) unfavourable ground conditions;

(b) disruption due to other causes;

(c) changes in design to suit actual site conditions and various unforeseen events;

(d) price escalations;

(e) additional project management cost (PMC) and insurance;

(f) further contingency for remaining works;

(g) additional government cost; and

minus (h) removal of Day 2 Works and associated PMC (Note: Since Day 2 Works are entirely funded under 53TR, **57TR** will **not** be affected by its removal).

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[3] Government costs include cost allowances for engaging M&V Consultants, financial consultant and other consultancy studies, as well as provision of government facilities, such as equipment for boundary control facilities at West Kowloon Terminus, etc.

12. Separate additional funding application will be made for **53TR**(PWSC(2015-16)XX). Details of the proposed increase in the APE of **57TR**, which is the subject of this paper, are elaborated in paragraphs 13 to 29 below.

(a) Unfavourable ground conditions

13. As illustrated in the paper PWSC(2015-16)XX for increasing the APE of **53TR**, unfavourable ground conditions, with some being unforeseen, is a common primary cause of progress delay and cost overrun for major infrastructure projects like the XRL project, affecting the whole spectrum of works, including the non-railway works.

14. Some of the non-railways works, including the construction of depressed road system at Austin Road West and Lin Cheung Road, construction of Road D1A, reconstruction of Wui Man Road, enabling works for Site A and WKCD, are part and parcel of the construction of WKT. Therefore, the progress of WKT delayed by the discovery of extensive utilities and unforeseen ground conditions including uncharted large boulders, corestones and uneven bedrock at the site also affected that of the non-railway works. Utilities were required to be decommissioned, slewed or diverted with interfaces among the utility companies. The presence of boulders and corestones obstructions also hampered the progress of works.

15. At Sham Mong Road, the enabling works, which included the foundation and piling works for the future footbridges, were also affected by the underground voids and obstructions encountered.

16. The above unfavourable ground conditions contribute to a cost increase of **$792 million**, which is **about 18.8%** of the proposed increase in APE.

(b) Disruption due to other causes

17. Due to the unfavourable ground condition encountered, the progress of the construction of diaphragm wall at WKT was adversely delayed. It had a knock-on delay on the progress of the subsequent works at WKT under different contracts. For example, delay in diaphragm walls construction under

Contract 811B – WKT Approach Tunnel – South led to a decision to divert a section of Jordan Road southward onto the north top-down area within Contract 810A – WKT Station North as a delay recovery measure. However, subsequent delays in Contract 811B had a knock-on effect on the handing over of the occupied north top-down area to Contract 810A for its construction works there. The productivity of Contract 810A was thus limited by the available space for excavation works.

18. We estimate that such disruption caused by others affecting non-railway works have led to an additional cost of **$853 million**, which is **about 20.2%** of the proposed increase.

(c) Changes in design to suit actual site conditions and various unforeseen circumstances

19. During the course of construction, there were also variations and enhancements in the scopes, design and construction methodologies of the Project to suit the actual site conditions and various unforeseen circumstances.

20. For example, the WKT will encroach into the underground area of the WKCD. The topside property development at Site A and the relevant part of the future WKCD facilities will be located above and supported by the enabling works constructed at WKT. To better integrate with the WKCD facilities, the design of which was only completed by the WKCD project after commencement of the non-railway works under **57TR**, two additional concrete slabs, one on ground floor and one on the basement first floor of WKT, were required to be constructed as the enabling works for WKCD under the XRL project. An additional structure was also required to be constructed to accommodate the WKT sea water cooling intake facilities, which were required to be relocated to suit the WKCD latest design. The design and locations of the ventilation structures for the WKCD facilities which were integrated to WKT structure were also substantially revised to suit the latest layout of the WKCD facilities.

21. To further enhance the convenience of XRL passengers interchanging with other road-based transport, the public transport interchange and parking spaces at the north of WKT were enlarged to accommodate more buses, minibuses and coaches for picking up and dropping off. In response to the

request by the local stakeholders, the design of the additional noise mitigation deck along Austin Road West was revised. Additional temporary traffic management schemes had been implemented on Austin Road West and Lin Cheung Road to minimize the impact on road users as well as to expedite the progress of the construction of the depressed road system thereat.

22. Based on the factors mentioned in paragraphs 19 – 21 above, we estimate that the changes in design has contributed to an increase of **$1,248 million**, which accounts for **about 29.6%** of the proposed increase.

(d) Price escalations

23. When the Government applied for the funding for **53TR** and **57TR** in January 2010, the cost estimate was based on the market situation and data available up to early 2009 by making reference to the cost information of similar infrastructure projects. Since then, there has been a surge in the construction prices, in particular for certain civil engineering works such as tunnelling and excavation, leading to the higher-than-expected unit prices of the Project. At the time of the estimate in early 2009, the forecast of the rate of change in the prices of public sector building and construction output was 2% per annum from 2009 to 2013 and 3% per annum from 2014 onwards. However, the actual cost escalation rate has been much higher for each year since 2009, ranging from 2.9% to 6.8% per annum.

24. Local labour costs have become more volatile since late 2009. Based on the relevant wages information from the Census and Statistics Department, the composite labour wages for civil engineering and building works increased by about 48% and 59% from December 2009 to February 2015. Furthermore, workers of the project often have to work underground or inside tunnel. The working environment is very tough compared to the other major infrastructure projects above ground. Workers have ample choice of job opportunities, and underground tunnelling works are less attractive to them. As a result, contractors have to pay workers at a considerable premium.

25. Due to the reasons mentioned in paragraphs 13 – 22 above, the XRL project has been significantly delayed. Coupled with the heated construction industry and price escalation, the construction cost has increased significantly over the past few years, which was not adequately allowed for in the current

budget. The accrued delays, and hence a longer construction period, have also aggravated the situation. Claims have been received in this regard. It is considered appropriate to make provision for the increase in project cost arising from price escalation. Based on the latest project estimate, the provision for price escalation has to be increased by about **$668 million**, contributing about **15.9%** of the proposed total increase.

(e) Additional PMC and insurance

26. MTRCL's PMC for the XRL project includes staff and corporate costs for the project team and project headquarters team, as well as other support services for the teams. The project team is responsible for project planning and management, and supervision of construction activities. The project headquarters team provides support for project control, planning and programming, procurement, and contract administration etc., while support services cover human resources, legal services, public relations, finance and information technology etc. With the extended construction period of the XRL project, additional PMC of 1,790 million for the project is required for the additional expenses on the staff, accommodation and corporate costs for the MTRCL project team and project headquarters team, as well as other support services. The additional PMC cost under **57TR** is **$345 million**, contributing **about 8.2%** of the proposed increase.

27. Additional insurance of about $912 million for the entire project is required for increased insurance coverage due to extended construction period and increase cost of works. The additional insurance cost under **57TR** is **$173 million**, contributing **about 4.1%** of the proposed increase.

(f) Further contingency for remaining works

28. Due to the aforementioned reasons, the contingency approved under the APE has been committed to offset the increase in cost of works. In the light of continuous challenges and risk which may arise as a result of past or future risk events, a further contingency amount of total $1,842 million for the remaining works under XRL project is allowed to provide additional cost certainty. It mostly covers further allowance for claims upon substantiation, and allowance for uncertainty associated with the current heated construction

market with high cost escalation. The further contingency under **57TR** is **$56 million**, contributing **about 1.3%** of the proposed increase.

(g) Additional Government cost

29. The increase in Government costs is to cover the expanded scope of works for the M&V consultancy services and other studies over the extended construction period. Provision for the prices escalation of the government facilities or equipment and other related public works. The additional Government cost under **57TR** is **$80 million**, contributing **about 1.9%** of the proposed increase.

OTHER OPTIONS

30. We understand that there are some suggestions on simply to suspend or even terminate the XRL contracts at this stage. The consequences of such a scenario, if materialised, are grave and must not be under-estimated.

Suspension of Contracts

31. According to a rough assessment by the HyD and MTRCL, the consequences if works had to be stopped because of lack of funding will be catastrophic. There will be huge additional **direct costs** associated with the suspension (not to mention termination) of the XRL contracts arising from the following areas:

(a) when the works contracts are suspended (or even terminated), the contractors are bound to submit monetary claims due to loss of profits and other expenses as a result. Although the contracts under XRL project are signed between MTRCL and the contractors, Government has entered into a deed poll with each of the contractors. These deeds provide that the contractors are liable to Government as if the Government and MTRCL are jointly named as the employer of the contracts, and vice versa. Hence, there are significant legal

ramifications for the Government should the XRL works contracts be suspended (or terminated);

(b) during the suspension period, there will be costs including keeping essential staff and plants as well as arranging regular maintenance and inspection for the unfinished civil and electrical and mechanical works until the final termination of all the contracts;

(c) all unfinished works, tunnels and works sites, in particular the huge opening at WKT, would need to be secured and protected to ensure safety of the sites and adjoining properties. There would also be a need to upkeep the temporary traffic management schemes being implemented and monitoring of ground water to address safety concerns; and

(d) if the works contracts were eventually terminated, there would be costs associated with termination of employment contracts, cancellation of works subcontracts, compensation of rental agreements for project office, storage and accommodation, and demobilisation of plants.

32. There are two scenarios <u>after</u> suspension of works contracts. The contracts would <u>either</u> be terminated eventually <u>or</u> the contracts would be resumed after the injection of fresh funding. MTRCL assessed that the additional cost incurred from paragraphs 31(a) to (d) above could be in the region of **$4.8 billion**. MTRCL pointed out that the contractors may take a different view as to their entitlements for the cost of works completed up to the date of suspension and accrued claim entitlements, which would lead to a series of complex, time consuming and expensive disputes, the outcome of which would be very difficult to predict. Further, the above estimate only assumes twelve-month expenditure for maintenance of the unfinished works. It has not taken into account the cost to the Government to continue with the protection of the unfinished works and to look after the equipment procured thereafter until such time when there is a way forward for the XRL project.

33. There are also **indirect costs** involved if the XRL works contracts are suspended, as illustrated below –

(a) the handover of the works sites and areas for the XRL project back to the Government will be delayed, resulting in opportunity costs associated with the relevant pieces of land. Such pieces of land include notably the one above WKT for topside development, the area of the WKCD currently occupied by the XRL project as works areas and sites, and the land scheduled to be handed over to Government for the implementation of the proposed Central Kowloon Route;

(b) some existing roads, such as Lin Cheung Road, are now closed to facilitate the construction of the XRL project. Such road closure has led to detour and additional travelling time for road users travelling to that area. If the XRL works contracts are suspended, the duration of closure would inevitably be lengthened. Similarly, the date of reinstatement of some temporary roads, such as Austin Road West, the alignment of which has been designed to temporary road standard, would be delayed; and

(c) the economic and social benefits to Hong Kong generated by the XRL would be lost.

Termination of Contracts

34. If the works are still suspended after 180 days, the contractors may treat it as abandonment. In other words, the contracts would be terminated. There are two scenarios after termination of the XRL contracts –

(a) resumption of the XRL project when funding is secured

Under this scenario, MTRCL will need to arrange new contractors to proceed with the outstanding works. The construction costs would likely escalate due to the possible increase in labour and material costs between the date of termination and date of re-entering of the contracts. Moreover, as the works contracts of unfinished works have been terminated, the warranties of the unfinished works by the relevant contractors will be voided. Even if the Government or the

MTRCL can identify subsequent contractors for re-entering the contracts, the new contractors will be expected to drive a hard bargain and will not provide warranties to the Government on the works which were carried out another contractor. As a result, the subsequent maintenance cost of which the Government is fully liable to will likely be much increased. The amount of resumption cost and additional maintenance cost would depend on the waiting period and status of the project when the resumption decision is made upon securing the additional funding. It is anticipated that the amount would be substantial and separate approval from LegCo would have to be sought for this additional amount of money.

(b) abandonment of the XRL project entirely

Under this scenario, the designs and unfinished works of the XRL project will become abortive. As of end September 2015, the total expenditure for the XRL project was $55.9 billion. This is yet to reflect the expenditure from September 2015 up until now, and the works that are already committed but not yet paid. The Government will also need to continue with the protection of the unfinished works and incur additional cost for maintenance of the procured facilities until there is new initiative with the unfinished works, which are designed for railway use only. If they are to be turned into other uses (e.g. commercial or cultural uses), it is envisaged that the cost will be much higher than if these alternative uses are to be sited elsewhere. More fundamentally, all the potential benefits which the XRL could bring to Hong Kong will be completely lost.

LIABILITIES

35. The Government deeply regrets the severe delay in, and the substantial cost overrun of, the XRL project. As the Government has publicly stated before, it will ascertain the liabilities of the parties concerned and will reserve all the rights to pursue the warranties and obligations from MTRCL regarding project implementation, works delay and project cost overrun. The process of establishing a case against any particular party, be it MTRCL or any of its agents, is expected to be protracted. In the meantime, we must not lose sight of

the fact that the XRL is a major transport infrastructure which will bring significant benefits to Hong Kong. It is imperative for us to provide timely funding to complete the rest of the XRL project.

SUMMARY OF FINANCIAL POSITION

36. A breakdown of the proposed increase of $4,215.0 million is as follows –

	Factors	**Proposed increased amount (in MOD prices) ($ million)**	**Percentage of the increased amount (%)**
	Increase due to -		
(a)	Unfavourable ground conditions	792.0	18.8%
(b)	Disruption due to other causes	853.0	20.2%
(c)	Changes in design to suit actual site conditions and various unforeseen circumstances	1,248.0	29.6%
(d)	Price escalations	668.0	15.9%
(e)	Additional PMC and insurance	518.0	12.3%
(f)	Further contingency for the remaining works	56.0	1.3%
(g)	Additional government cost	80.0	1.9%
(h)	Proposed increase (h)=(a) to (g)	4,215.0	100%

FINANCIAL IMPLICATIONS

37. Subject to funding approval, we will revise the phased expenditure as follows –

Year	$ million (in MOD prices)
Up to March 2015	7,529.81
2015-2016	1,850.92
2016-2017	2,419.27
2017-2018	2,040.00
2018-2019	1,040.00
2019-2020	810.00
2020-2021	325.00
Total	**16,015.0**

38. The proposed increase in the APE will not give rise to any additional recurrent expenditure.

PUBLIC CONSULTATION

39. We will consult the Subcommittee on Matters Relating to Railways of the LegCo on the proposed increase in APE for the **53TR** and **57TR** on 4 December 2015.

BACKGROUND INFORMATION

40. The FC approved the upgrading of **57TR** to Category A in January 2010 at an estimated cost of $11,800 million in MOD prices. The Legislative Council has been kept informed of the progress of the project, including delays

and the reasons for these, delay recovery measures undertaken, as well as cost implications.

41. The proposed increase in the APE will not involve the creation of any additional professional and technical posts or job opportunities.

Transport and Housing Bureau
November 2015

List of Essential Public Infrastructure Works (EPIW)

Item	Location	Description	Drawing
1	West Kowloon	Three proposed footbridge links to Kowloon Station	Enclosure 1 (Sheet 2 of 2)
2	West Kowloon	Proposed subway link to the footpath at west of Lin Cheung Road	
3	West Kowloon	Reconstruction of part of Austin Road West and Lin Cheung Road, proposed Road D1A and reconstruction of Wui Man Road and proposed noise barriers/enclosures	
4	West Kowloon	Proposed footbridge above Road D1A near Man Cheong Street	
5	West Kowloon	Proposed footbridge link to public transport interchange at north of Jordan Road	
6	West Kowloon	Two proposed footbridge links to Austin Station	
7	West Kowloon	Proposed subway link to Austin Station	

附件1 （2張中的第2張）
ENCLOSURE 1 (SHEET 2 OF 2)

項目（3）－ 重建部份柯士甸道西和連翔道，擬建D1A新道路，重建匯民路及擬建隔音屏障／隔音罩
ITEM (3)- RECONSTRUCTION OF PART OF AUSTIN ROAD WEST AND LIN CHEUNG ROAD, PROPOSED ROAD D1A AND RECONSTRUCTION OF WUI MAN ROAD AND PROPOSED NOISE BARRRIER / ENCLOSURE

項目（4）－ 近文昌街建造跨越行車路 D1A 的行人天橋
ITEM (4)- PROPOSED FOOTBRIDGE ABOVE ROAD D1A NEAR MAN CHEONG STREET

項目（5）－ 擬建行人天橋至佐敦道北公共運輸交滙處
ITEM (5)- PROPOSED FOOTBRIDGE LINKING TO PUBLIC TRANSPORT INTERCHANGE AT NORTH OF JORDAN ROAD

D1A路
ROAD D1A

項目（1）－ 擬建3條行人天橋至九龍站
ITEM (1) - PROPOSED 3 FOOTBRIDGES LINKING TO KOWLOON STATION

項目（6）－ 擬建2條行人天橋至柯士甸站
ITEM (6)- PROPOSED 2 FOOTBRIDGES LINKING TO AUSTIN STATION

佐敦道

JORDAN ROAD

九龍站
KOWLOON STATION

連翔道
LIN CHEUNG ROAD

項目（2）－ 擬建行人隧道至連翔道西面行人路
ITEM (2) - PROPOSED SUBWAY LINKING TO THE FOOTPATH AT WEST OF LIN CHEUNG ROAD

AUSTIN STATION

匯民路
WUI MAN ROAD

擬建的西九龍總站
PROPOSED WEST KOWLOON TERMINUS

柯士甸站

柯士甸道西 AUSTIN ROAD WEST

項目（7）－ 擬建行人隧道至柯士甸站
ITEM (7)- PROPOSED SUBWAY LINKING TO AUSTIN STATION

米 0 50 100 150 m
比例尺 1 : 4 000 SCALE BAR

圖例 LEGEND:

- 廣深港高速鐵路方案界線 BOUNDARY OF XRL SCHEME
- 擬建行人天橋 PROPOSED FOOTBRIDGE
- 擬建行人隧道 PROPOSED SUBWAY
- 擬建行車道／地下行車道 PROPOSED ROAD / DEPRESSED ROAD
- 擬建隔音屏障／隔音罩 PROPOSED NOISE BARRIER / ENCLOSURE

圖則名稱 drawing title
工務計劃項目第57TR號 － 廣深港高速鐵路香港段 － 非鐵路建造工程
主要基建工程
項目 (1)、(2)、(3)、(4)、(5)、(6)及(7)
PWP ITEM NO. 57TR - HONG KONG SECTION OF GUANGZHOU-SHENZHEN-HONG KONG EXPRESS RAIL LINK - CONSTRUCTION OF NON-RAILWAY WORKS ESSENTIAL PUBLIC INFRASTRUCTURE WORKS
ITEM (1), (2), (3), (4), (5), (6) & (7)

S. H. LAM 23/11/09
總工程師 CHIEF ENGINEER 日期 DATE

設計 designed W. H. LIU 23/11/09
繪圖 drawn Y. L. MA 23/11/09
核對 checked W. H. LIU 23/11/09
核准 approved K. T. LI 23/11/09

圖號 drawing no. HRWXRL002-SP0001

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路政署 HIGHWAYS DEPARTMENT

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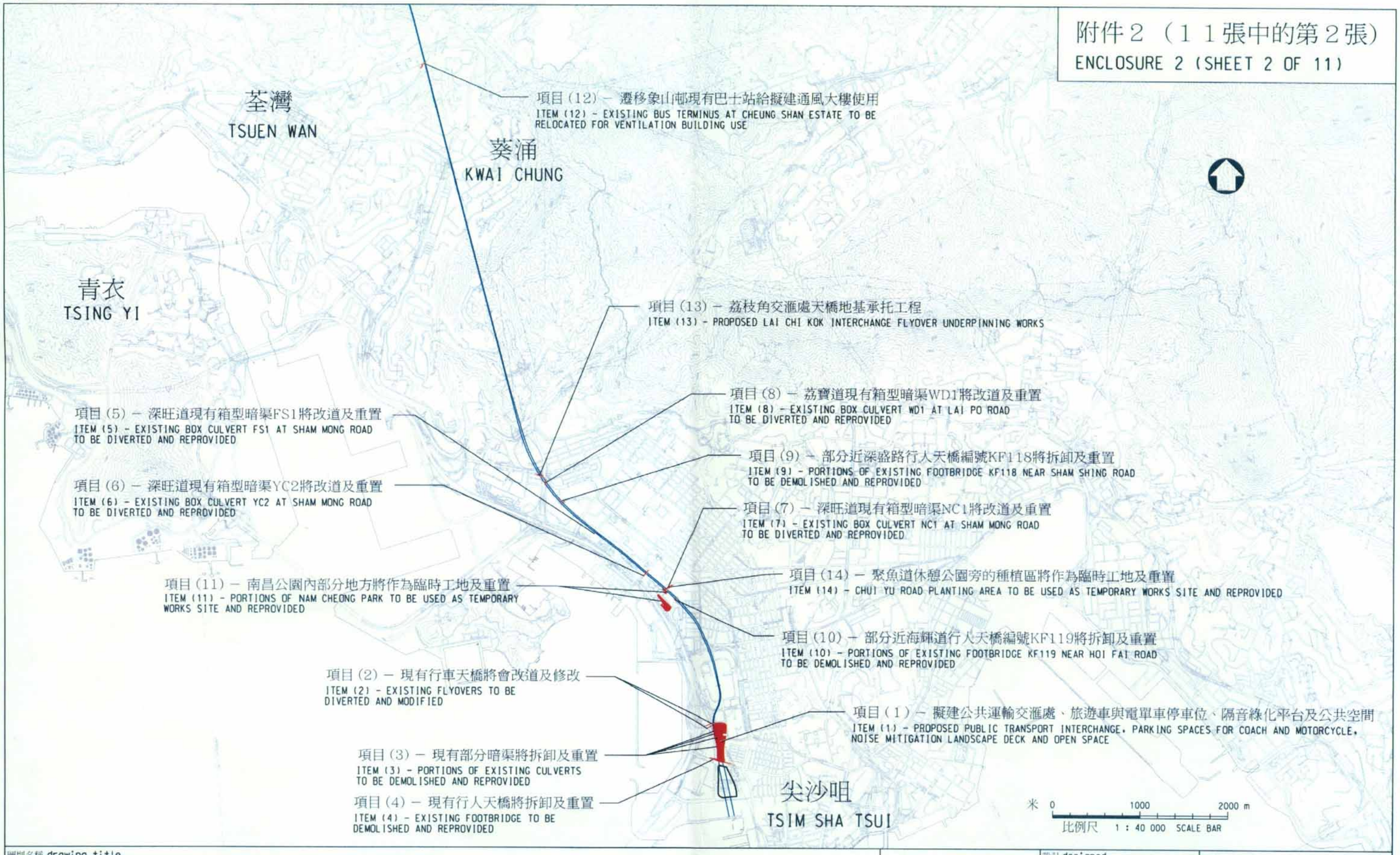
A3 297X420

List of Reprovisioning, Remedial and Improvement Works (RRIW)

(Item locations are shown in Enclosure 2 (Sheet 2 of 11))

Item	Location	Description	Drawing
1	West Kowloon	Proposed public transport interchange, parking spaces for coach and motorcycle, noise mitigation landscape deck and open space	Enclosure 2 (Sheet 3 of 11)
2	West Kowloon	Existing flyovers to be diverted and modified	
3	West Kowloon	Portions of existing culverts to be demolished and reprovided	
4	West Kowloon	Existing footbridge to be demolished and reprovided	
5	Sham Shui Po	Existing Box Culvert FS1 at Sham Mong Road to be diverted and reprovided	Enclosure 2 (Sheet 4 of 11)
6	Sham Shui Po	Existing Box Culvert YC2 at Sham Mong Road to be diverted and reprovided	Enclosure 2 (Sheet 5 of 11)
7	Sham Shui Po	Existing Box Culvert NC1 at Sham Mong Road to be diverted and reprovided	
8	Lai Chi Kok	Existing Box Culvert WD1 at Lai Po Road to be diverted and reprovided	Enclosure 2 (Sheet 6 of 11)
9	Tai Kok Tsui	Portions of existing footbridge KF118 near Sham Shing Road to be demolished and reprovided	Enclosure 2 (Sheet 7 of 11)
10	Sham Shui Po	Portions of existing footbridge KF119 near Hoi Fai Road to be demolished and reprovided	Enclosure 2 (Sheet 8 of 11)
11	Sham Shui Po	Portions of Nam Cheong Park to be used as temporary works site and reprovided	Enclosure 2 (Sheet 9 of 11)
12	Tsuen Wan	Existing Bus Terminus at Cheung Shan Estate to be relocated for ventilation building use	Enclosure 2 (Sheet 10 of 11)
13	Lai Chi Kok	Proposed Lai Chi Kok Interchange flyover underpinning works	Enclosure 2 (Sheet 11 of 11)
14	Tai Kok Tsui	Chui Yu Road planting area to be used as temporary works site and reprovided	Enclosure 2 (Sheet 9 of 11)

附件２（１１張中的第２張）
ENCLOSURE 2 (SHEET 2 OF 11)



圖則名稱 drawing title
工務計劃項目第57TR號 – 廣深港高速鐵路香港段 – 非鐵路建造工程
重置、補救及改善工程
位置圖
PWP ITEM NO. 57TR - HONG KONG SECTION OF GUANGZHOU-SHENZHEN-HONG KONG EXPRESS RAIL LINK - CONSTRUCTION OF NON-RAILWAY WORKS REPROVISIONING, REMEDIAL AND IMPROVEMENT WORKS
LOCATION PLAN

S. H. LAM 23/11/09
總工程師 CHIEF ENGINEER 日期 DATE

設計 designed K. K. LEI 23/11/09
繪圖 drawn Y. L. MA 23/11/09
核對 checked K. K. LEI 23/11/09
核准 approved C. W. YUNG 23/11/09

圖號 drawing no. HRWXRL002-SP0010

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附件2 （11張中的第3張）
ENCLOSURE 2 (SHEET 3 OF 11)

項目（2）– 現有行車天橋將會改道及修改
ITEM (2) - EXISTING FLYOVERS TO BE DIVERTED AND MODIFIED

廣深港高速鐵路方案界線
BOUNDARY OF XRL SCHEME

項目（3）– 現有部分暗渠將拆卸及重置
ITEM (3) - PORTIONS OF EXISTING CULVERTS TO BE DEMOLISHED AND REPROVIDED

項目（1）– 擬建公共運輸交滙處、旅遊車與電單車停車位、隔音綠化平台及公共空間
ITEM (1) - PROPOSED PUBLIC TRANSPORT INTERCHANGE, PARKING SPACES FOR COACH AND MOTORCYCLE, NOISE MITIGATION LANDSCAPE DECK AND OPEN SPACE

項目（4）– 現有行人天橋將拆卸及重置
ITEM (4) - EXISTING FOOTBRIDGE TO BE DEMOLISHED AND REPROVIDED

佐敦道

JORDAN ROAD

米 0 50 100 150 m
比例尺 1 : 3 000 SCALE BAR

圖則名稱 drawing title
工務計劃項目第57TR號 – 廣深港高速鐵路香港段 – 非鐵路建造工程
重置、補救及改善工程
項目(1)、(2)、(3)及(4)
PWP ITEM NO. 57TR - HONG KONG SECTION OF GUANGZHOU-SHENZHEN-HONG KONG EXPRESS RAIL LINK - CONSTRUCTION OF NON-RAILWAY WORKS REPROVISIONING, REMEDIAL AND IMPROVEMENT WORKS ITEM (1), (2), (3) & (4)

S. H. LAM 23/11/09
總工程師 CHIEF ENGINEER 日期 DATE

設計 designed W. H. LIU 23/11/09
繪圖 drawn Y. L. MA 23/11/09
核對 checked W. H. LIU 23/11/09
核准 approved K. T. LI 23/11/09

圖號 drawing no. HRWXRL002-SP0008

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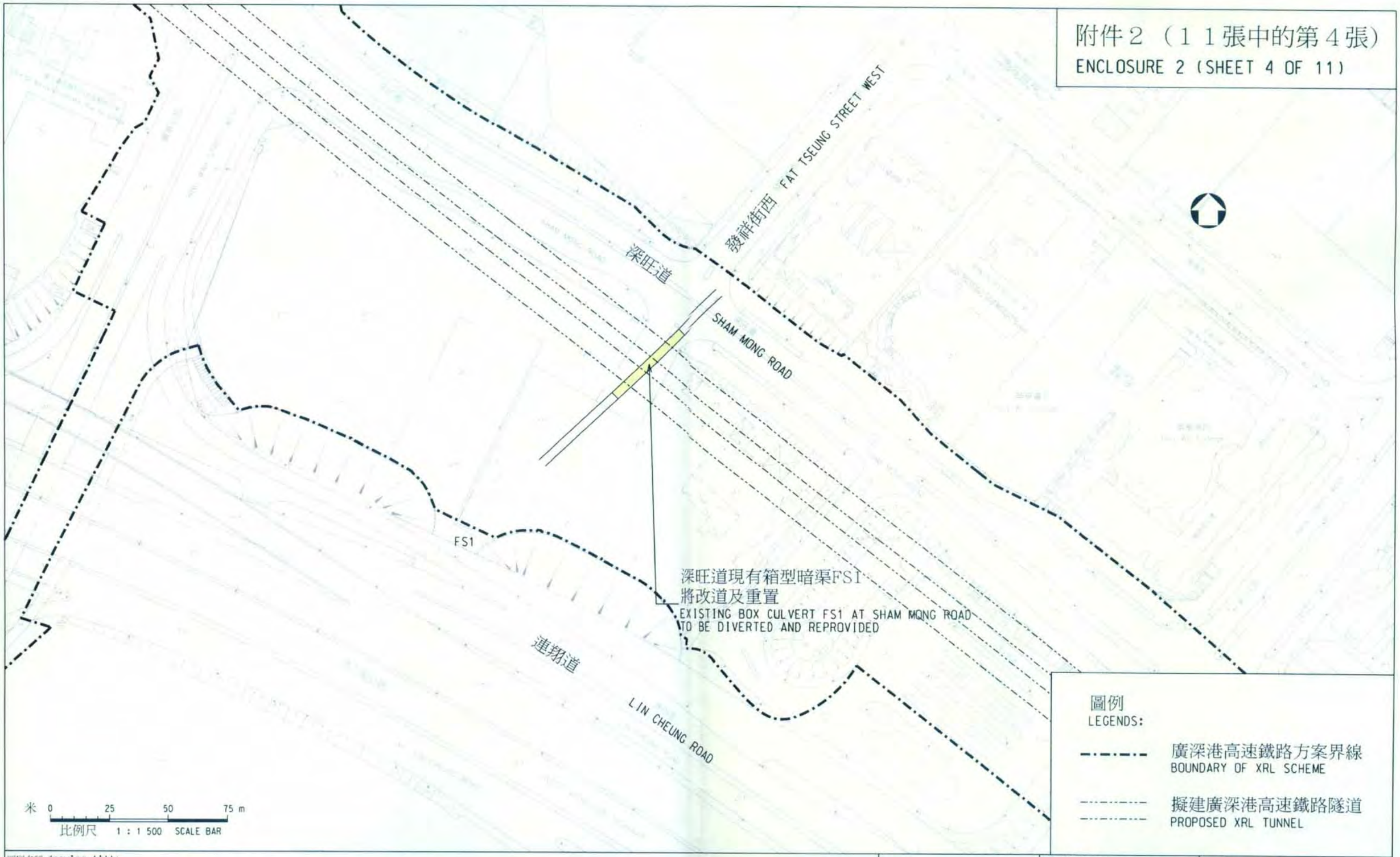
附件２（１１張中的第４張）
ENCLOSURE 2 (SHEET 4 OF 11)



圖則名稱 drawing title
工務計劃項目第57TR號 － 廣深港高速鐵路香港段 － 非鐵路建造工程
重置、補救及改善工程
項目 (5) － 深旺道現有箱型暗渠FS1將改道及重置
PWP ITEM NO. 57TR - HONG KONG SECTION OF GUANGZHOU-SHENZHEN-HONG KONG EXPRESS RAIL LINK - CONSTRUCTION OF NON-RAILWAY WORKS
REPROVISIONING, REMEDIAL AND IMPROVEMENT WORKS
ITEM (5) - EXISTING BOX CULVERT FS1 AT SHAM MONG ROAD TO BE DIVERTED AND REPROVIDED

S. H. LAM
總工程師 CHIEF ENGINEER
日期 DATE 23/11/09

設計 designed K. WONG 23/11/09
繪圖 drawn Y. L. MA 23/11/09
核對 checked K. WONG 23/11/09
核准 approved K. H. WAN 23/11/09

圖號 drawing no. HRWXRL002-SP0007
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路政署 HIGHWAYS DEPARTMENT

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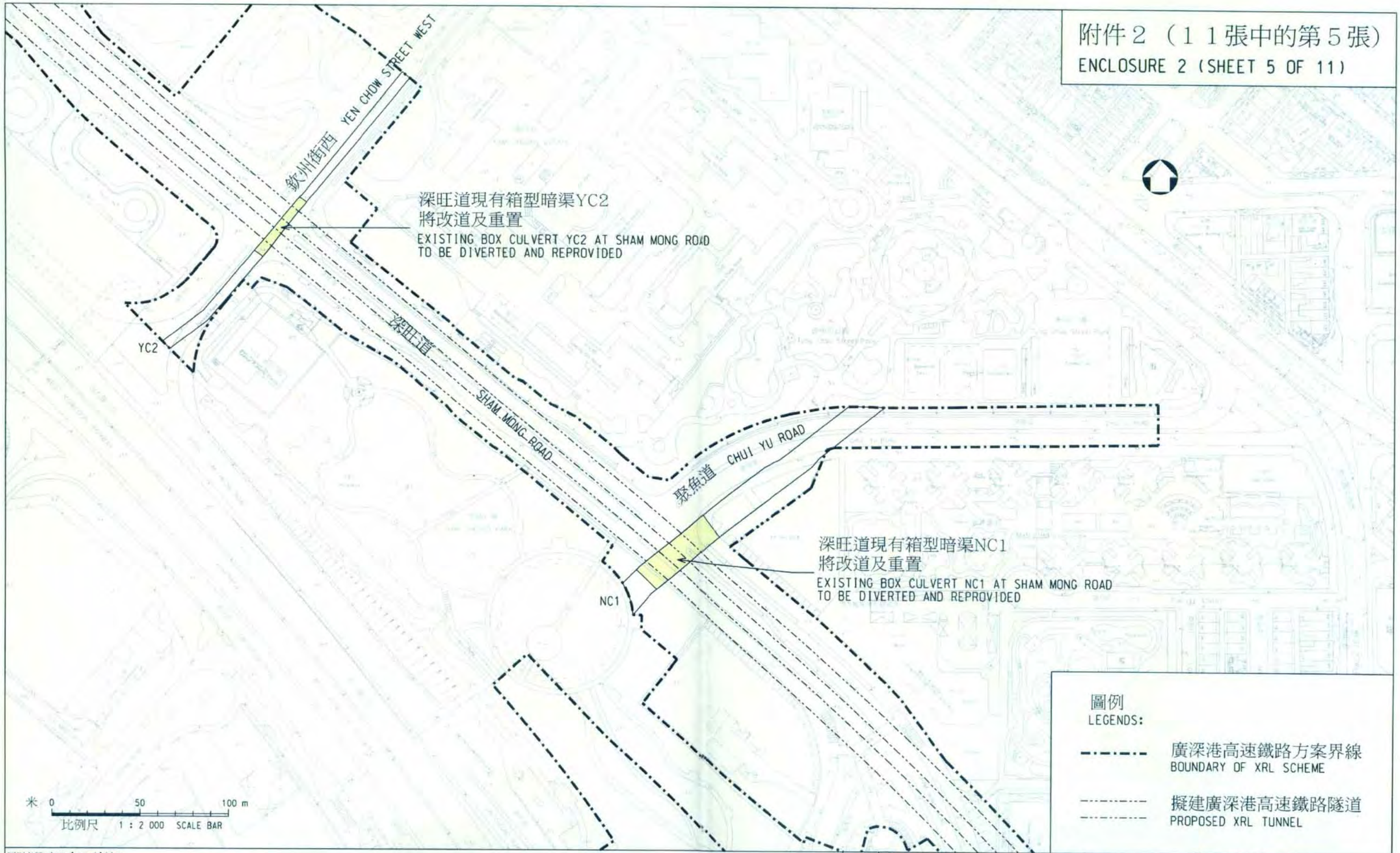
A3 297X420

附件２（１１張中的第５張）
ENCLOSURE 2 (SHEET 5 OF 11)



圖則名稱 drawing title
工務計劃項目第57TR號 － 廣深港高速鐵路香港段 － 非鐵路建造工程
重置、補救及改善工程
項目 (6)及(7) － 深旺道現有箱型暗渠YC2及NC1將改道及重置
PWP ITEM NO. 57TR - HONG KONG SECTION OF GUANGZHOU-SHENZHEN-HONG KONG EXPRESS RAIL LINK - CONSTRUCTION OF NON-RAILWAY WORKS
REPROVISIONING, REMEDIAL AND IMPROVEMENT WORKS
ITEM (6) & (7) - EXISTING BOX CULVERT YC2 AND NC1 AT SHAM MONG ROAD TO BE DIVERTED AND REPROVIDED

S. H. LAM
總工程師 CHIEF ENGINEER
23/11/09 日期 DATE

設計 designed K. WONG 23/11/09
繪圖 drawn Y. L. MA 23/11/09
核對 checked K. WONG 23/11/09
核准 approved K. H. WAN 23/11/09

圖號 drawing no. HRWXRL002-SP0006

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路政署 HIGHWAYS DEPARTMENT

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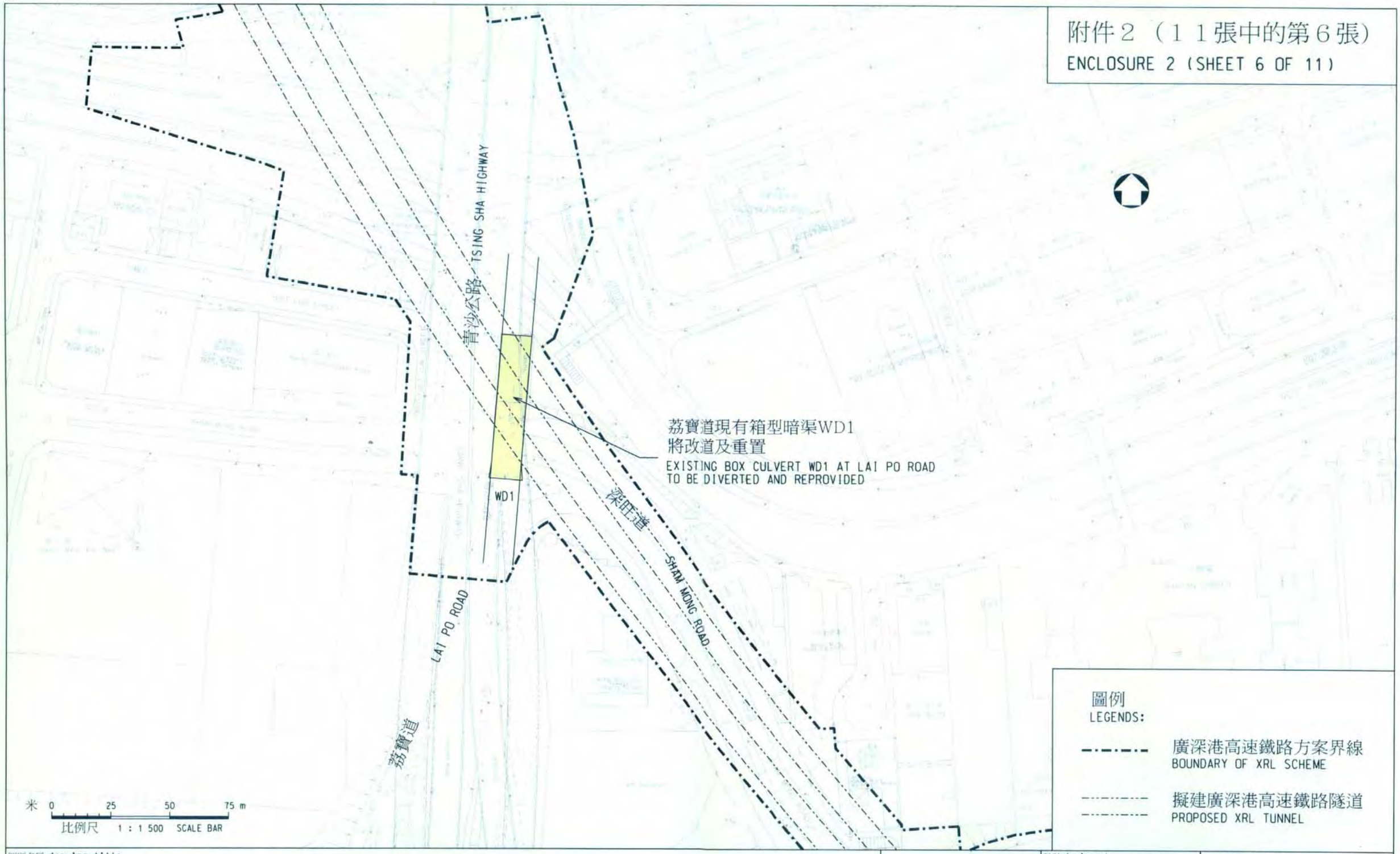

圖則名稱 drawing title
工務計劃項目第57TR號 － 廣深港高速鐵路香港段 － 非鐵路建造工程
重置、補救及改善工程
項目 (8) － 荔寶道現有箱型暗渠WD1將改道及重置
PWP ITEM NO. 57TR - HONG KONG SECTION OF GUANGZHOU-SHENZHEN-HONG KONG EXPRESS RAIL LINK - CONSTRUCTION OF NON-RAILWAY WORKS
REPROVISIONING, REMEDIAL AND IMPROVEMENT WORKS
ITEM (8) - EXISTING BOX CULVERT WD1 AT LAI PO ROAD TO BE DIVERTED AND REPROVIDED

S. H. LAM
總工程師 CHIEF ENGINEER
日期 DATE 23/11/09

設計 designed K. WONG 23/11/09
繪圖 drawn Y. L. MA 23/11/09
核對 checked K. WONG 23/11/09
核准 approved K. H. WAN 23/11/09

圖號 drawing no. HRWXRL002-SP0015

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路政署 HIGHWAYS DEPARTMENT

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附件２　（１１張中的第７張）
ENCLOSURE 2 (SHEET 7 OF 11)

香港專業教育學院
黃克競分校海傍校舍
HK I.V.E.HAKING WONG
WATERFRONT ANNEX

深盛路
SHAM SHING ROAD

海麗商場
HOI LAI
SHOPPING CENTRE

深旺道
SHAM MONG ROAD

深水埗官立小學
SHAM SHUI PO
GOVERNMENT PRIMARY SCHOOL

(下層停車場)

米 0 10 20 m
比例尺 1 : 400 SCALE BAR

擬重置現有行人天橋
PROPOSED REPROVISIONING OF EXISTING FOOTBRIDGE

圖例 LEGEND:
+11.00mPD 香港主水平基準以上11米
11m ABOVE HONG KONG PRINCIPAL DATUM

切面圖 SECTION
比例 SCALE 1:400

圖例
LEGENDS:

廣深港高速鐵路方案界線
BOUNDARY OF XRL SCHEME

擬建廣深港高速鐵路隧道
PROPOSED XRL TUNNEL

部份現有行人天橋將予臨時拆卸/移除
並在廣深港高速鐵路隧道建成後重置
PORTIONS OF EXISTING FOOTBRIDGE TO BE TEMPORARILY DEMOLISHED/REMOVED AND REPROVIDED UPON COMPLETION OF THE XRL TUNNELS

圖則名稱 drawing title
工務計劃項目第57TR號 － 廣深港高速鐵路香港段 － 非鐵路建造工程
重置、補救及改善工程
項目(9) － 部分近深盛路行人天橋編號KF118將拆卸及重置
PWP ITEM NO. 57TR - HONG KONG SECTION OF GUANGZHOU-SHENZHEN-HONG KONG EXPRESS RAIL LINK - CONSTRUCTION OF NON-RAILWAY WORKS
REPROVISIONING, REMEDIAL AND IMPROVEMENT WORKS
ITEM (9) - PORTIONS OF EXISTING FOOTBRIDGE KF118 NEAR SHAM SHING ROAD TO BE DEMOLISHED AND REPROVIDED

S. H. LAM
總工程師 CHIEF ENGINEER
P.P 23/11/09 日期 DATE

設計 designed	W. K. TSUI	23/11/09
繪圖 drawn	Y. L. MA	23/11/09
核對 checked	W. K. TSUI	23/11/09
核准 approved	K. H. WAN	23/11/09

圖號 drawing no. HRWXRL002-SP0002
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路政署 HIGHWAYS DEPARTMENT

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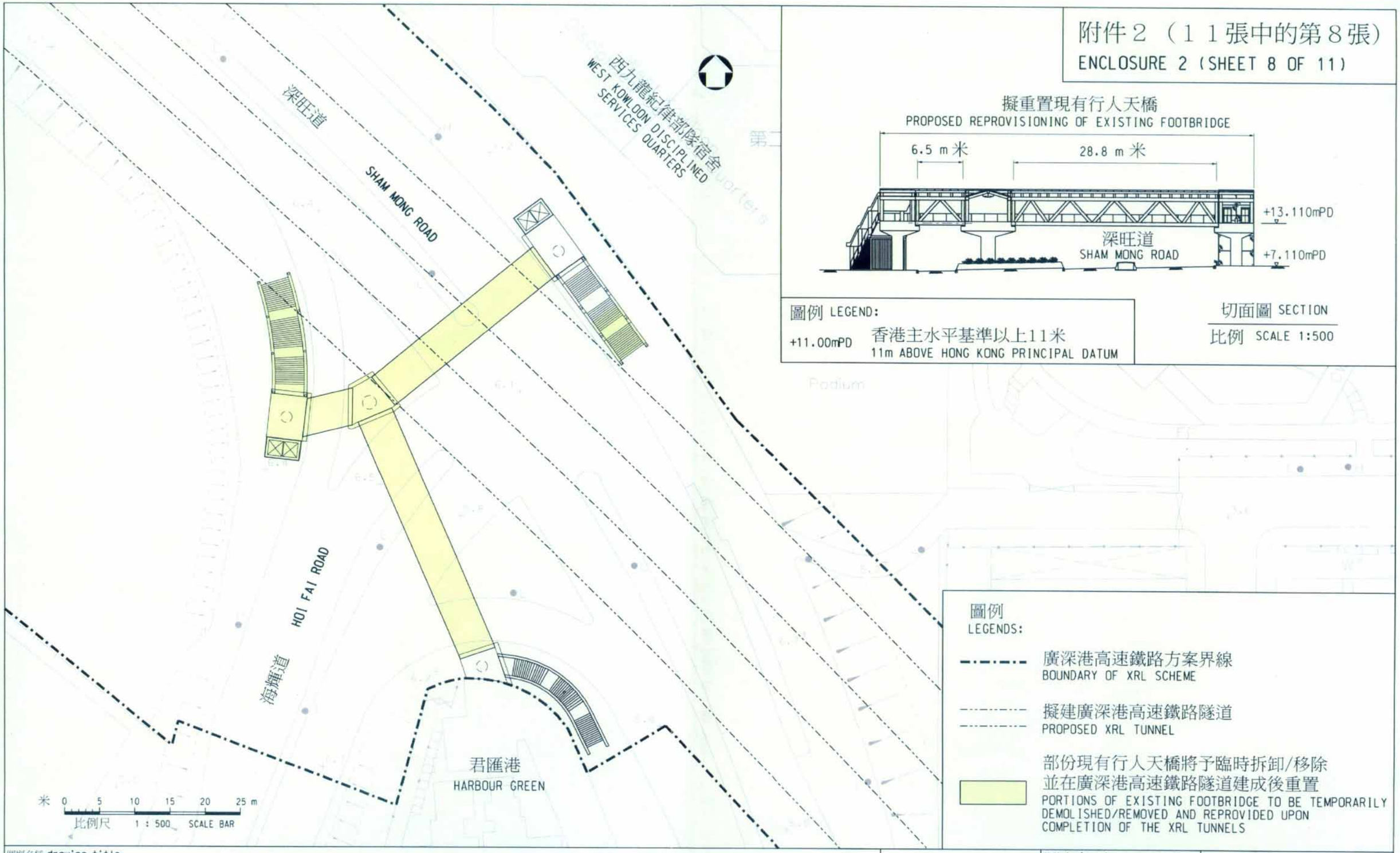
附件２（１１張中的第８張）
ENCLOSURE 2 (SHEET 8 OF 11)

擬重置現有行人天橋
PROPOSED REPROVISIONING OF EXISTING FOOTBRIDGE

切面圖 SECTION
比例 SCALE 1:500

圖例 LEGEND:
+11.00mPD 香港主水平基準以上11米
11m ABOVE HONG KONG PRINCIPAL DATUM



圖例
LEGENDS:

廣深港高速鐵路方案界線
BOUNDARY OF XRL SCHEME

擬建廣深港高速鐵路隧道
PROPOSED XRL TUNNEL

部份現有行人天橋將予臨時拆卸/移除
並在廣深港高速鐵路隧道建成後重置
PORTIONS OF EXISTING FOOTBRIDGE TO BE TEMPORARILY DEMOLISHED/REMOVED AND REPROVIDED UPON COMPLETION OF THE XRL TUNNELS

圖則名稱 drawing title
工務計劃項目第57TR號 － 廣深港高速鐵路香港段 － 非鐵路建造工程
重置、補救及改善工程
項目(10) － 部分近海輝道行人天橋編號KF119將拆卸及重置
PWP ITEM NO. 57TR - HONG KONG SECTION OF GUANGZHOU-SHENZHEN-HONG KONG EXPRESS RAIL LINK - CONSTRUCTION OF NON-RAILWAY WORKS REPROVISIONING, REMEDIAL AND IMPROVEMENT WORKS
ITEM (10) - PORTIONS OF EXISTING FOOTBRIDGE KF119 NEAR HOI FAI ROAD TO BE DEMOLISHED AND REPROVIDED

S. H. LAM 總工程師 CHIEF ENGINEER — P.P. 日期 DATE 23/11/09

設計 designed W. K. TSUI 23/11/09
繪圖 drawn Y. L. MA 23/11/09
核對 checked W. K. TSUI 23/11/09
核准 approved K. H. WAN 23/11/09

圖號 drawing no. HRWXRL002-SP0003
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附件２ （１１張中的第９張）
ENCLOSURE 2 (SHEET 9 OF 11)

南昌公園
NAM CHEONG PARK

聚魚道 CHUI YU ROAD

深旺道 SHAM MONG ROAD

米 0 50 100 m
比例尺 1 : 2 000 SCALE BAR

圖例
LEGEND:

- 廣深港高速鐵路方案界線 BOUNDARY OF XRL SCHEME
- 擬建的廣深港高速鐵路隧道 PROPOSED XRL TUNNEL
- 聚魚道休憩公園旁的種植區將作為臨時工地及重置 CHUI YU ROAD PLANTING AREA TO BE USED AS TEMPORARY WORKS SITE AND REPROVIDED
- 南昌公園內部分地方將作為臨時工地及重置 PORTIONS OF NAM CHEONG PARK TO BE USED AS TEMPORARY WORKS SITE AND REPROVIDED

圖則名稱 drawing title
工務計劃項目第57TR號 － 廣深港高速鐵路香港段 － 非鐵路建造工程
重置、補救及改善工程
項目(11)及(14) － 南昌公園內部分地方及聚魚道休憩公園旁的種植區將作為臨時工地及重置
PWP ITEM NO. 57TR - HONG KONG SECTION OF GUANGZHOU-SHENZHEN-HONG KONG EXPRESS RAIL LINK - CONSTRUCTION OF NON-RAILWAY WORKS REPROVISIONING, REMEDIAL AND IMPROVEMENT WORKS
ITEM (11)&(14) - PORTIONS OF NAM CHEONG PARK & CHUI YU ROAD PLANTING AREA TO BE USED AS TEMPORARY WORKS SITE & REPROVIDED

S. H. LAM 23/11/09
總工程師 CHIEF ENGINEER 日期 DATE

設計 designed K. WONG 23/11/09
繪圖 drawn Y. L. MA 23/11/09
核對 checked K. WONG 23/11/09
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象山邨西路 CHEUNG SHAN ESTATE ROAD WEST

FOOTPATH

城門通風大樓
SHING MUN
VENTILATION BUILDING

PAVED SURFACE

PAVED SURFACE

PARKING AREA FOR FIRE APPLIANCES

象山邨東路

城門通風大樓界線
SITE BOUNDARY OF
SHING MUN VENTILATION BUILDING

擬建緊急車輛出入口
PROPOSED RUN-IN FOR
EMERGENCY VEHICLES

米 0 5 10 15 20 25 m
比例尺 1 : 500 SCALE BAR

圖例
LEGENDS:

- 廣深港高速鐵路方案界線
  BOUNDARY OF XRL SCHEME
- 擬建廣深港高速鐵路隧道
  PROPOSED XRL TUNNEL
- 擬建巴士掉頭處
  PROPOSED BUS TURNING AREA
- 將予重建的行人路
  FOOTPATH TO BE RE-CONSTRUCTED
- 擬建重置的巴士站
  PROPOSED RELOCATED BUS STOP
- 現有的巴士站將會遷移
  EXISTING BUS STOP TO BE RELOCATED

圖則名稱 drawing title
工務計劃項目第57TR號 － 廣深港高速鐵路香港段 － 非鐵路建造工程
重置、補救及改善工程
項目(12) － 遷移象山邨現有巴士站給擬建通風大樓使用
PWP ITEM NO. 57TR - HONG KONG SECTION OF GUANGZHOU-SHENZHEN-HONG KONG EXPRESS RAIL LINK - CONSTRUCTION OF NON-RAILWAY WORKS
REPROVISIONING, REMEDIAL AND IMPROVEMENT WORKS
ITEM (12) - EXISTING BUS TERMINUS AT CHEUNG SHAN ESTATE TO BE RELOCATED FOR VENTILATION BUILDING USE

S. H. LAM
總工程師 CHIEF ENGINEER
23/11/09 日期 DATE

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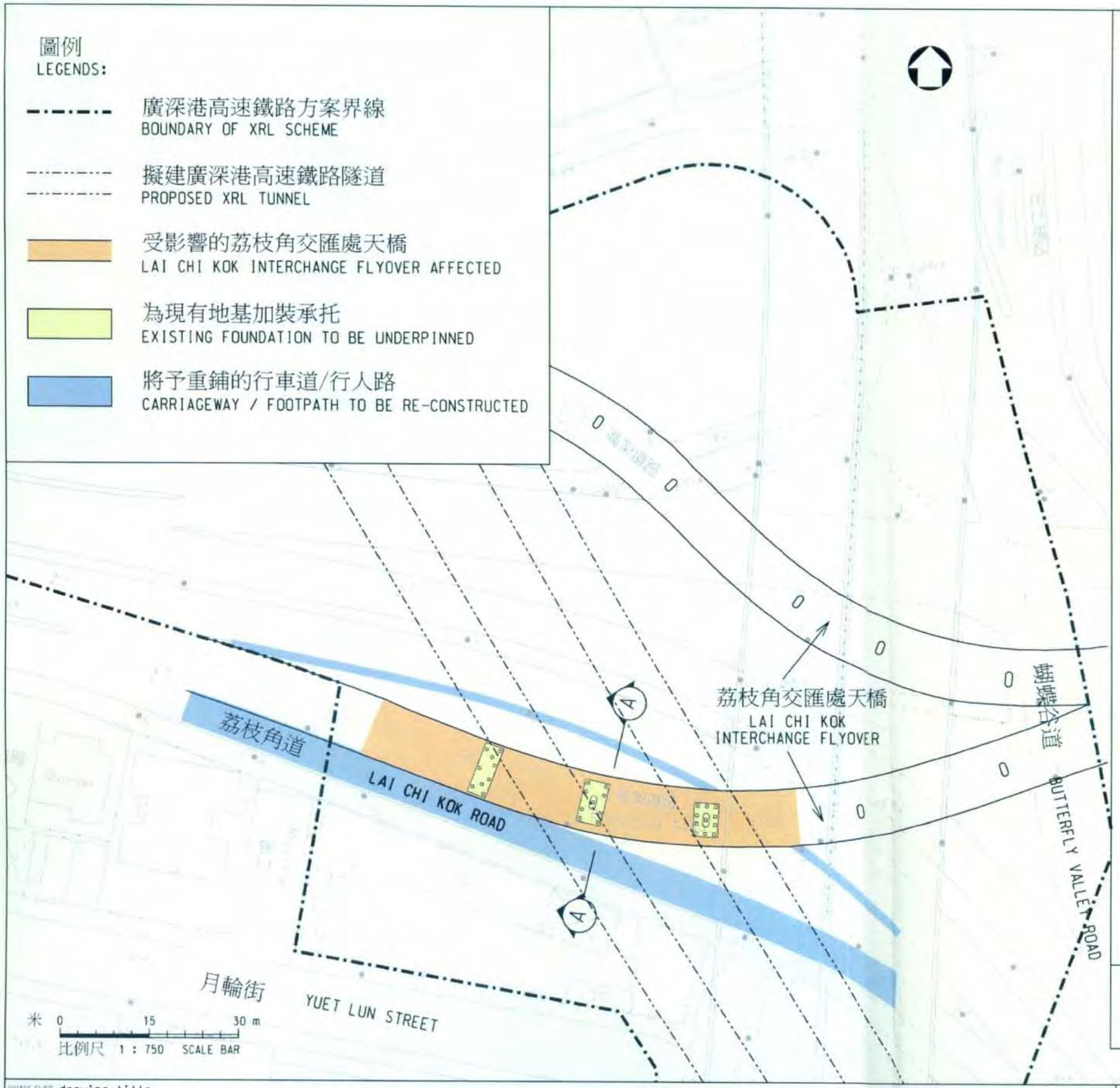
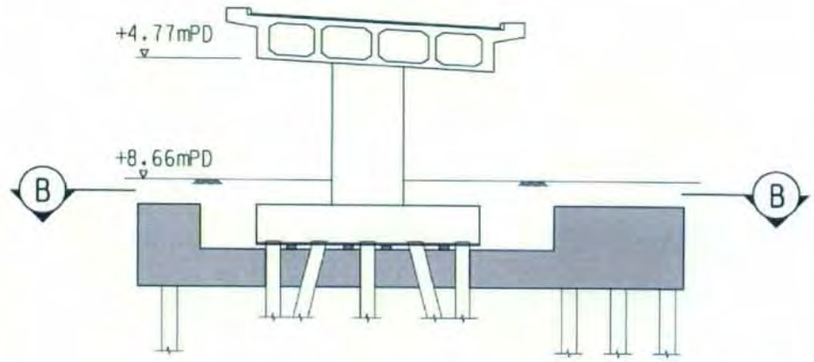
HRWXRL002-SP0012
HRWXRL002-SP0012.dgn 23-11-2009
A3 297X420

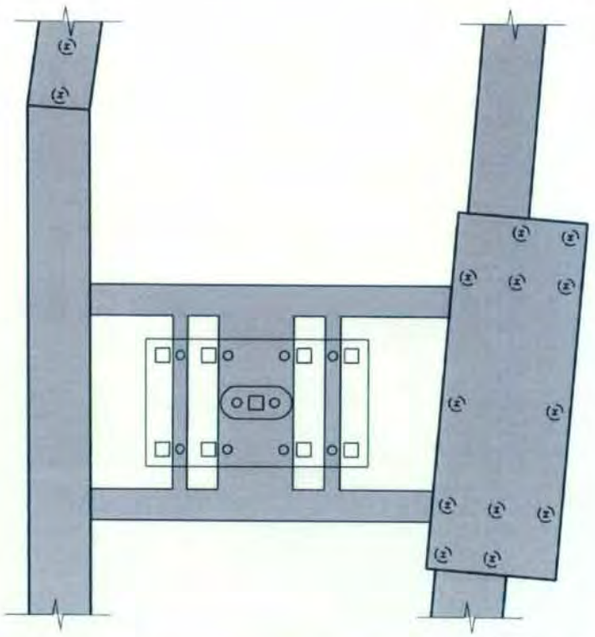
圖例
LEGENDS:

- 廣深港高速鐵路方案界線 BOUNDARY OF XRL SCHEME
- 擬建廣深港高速鐵路隧道 PROPOSED XRL TUNNEL
- 受影響的荔枝角交匯處天橋 LAI CHI KOK INTERCHANGE FLYOVER AFFECTED
- 為現有地基加裝承托 EXISTING FOUNDATION TO BE UNDERPINNED
- 將予重鋪的行車道/行人路 CARRIAGEWAY / FOOTPATH TO BE RE-CONSTRUCTED





切面圖 SECTION A-A
比例 SCALE 1:200



切面圖 SECTION B-B
比例 SCALE 1:200

圖例 LEGEND:
+8.66mPD 香港主水平基準以上11米
8.66m ABOVE HONG KONG PRINCIPAL DATUM

圖則名稱 drawing title
工務計劃項目第57TR號 — 廣深港高速鐵路香港段 — 非鐵路建造工程
重置、補救及改善工程
項目(13) — 荔枝角交滙處天橋地基承托工程
PWP ITEM NO. 57TR - HONG KONG SECTION OF GUANGZHOU-SHENZHEN-HONG KONG EXPRESS RAIL LINK - CONSTRUCTION OF NON-RAILWAY WORKS REPROVISIONING, REMEDIAL AND IMPROVEMENT WORKS
ITEM (13) - PROPOSED LAI CHI KOK INTERCHANGE FLYOVER UNDERPINNING WORKS

S. H. LAM 總工程師 CHIEF ENGINEER — 日期 DATE 23/11/09

設計 designed	W. K. TSUI	23/11/09
繪圖 drawn	Y. L. MA	23/11/09
核對 checked	W. K. TSUI	23/11/09
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List of Enabling Works

Item	Location	Description	Drawing
1	West Kowloon	Enabling works for topside property development at Site A	Enclosure 3 (Sheet 2 of 3)
2	West Kowloon	Enabling works for West Kowloon Cultural District Development	
3	West Kowloon	Cooling Mains for topside property development at Site A	
4	Sham Shui Po	Proposed protection works for XRL tunnels along Sham Mong Road.	Enclosure 3 (Sheet 3 of 3)

附件3 （3張中的第2張）
ENCLOSURE 3 (SHEET 2 OF 3)

佐敦道

JORDAN ROAD

AUSTIN STATION

九龍站
KOWLOON STATION

連翔道
LIN CHEUNG ROAD

用地A／擬建的西九龍總站
SITE A /PROPOSED WEST KOWLOON TERMINUS

柯士甸站

柯士甸道西 AUSTIN ROAD WEST

西九文化區
WEST KOWLOON CULTURAL DISTRICT

米 0 50 100 150 m
比例尺 1 : 4 000 SCALE BAR

圖例 LEGEND:

- 廣深港高速鐵路方案界線 BOUNDARY OF XRL SCHEME
- 項目（1）－用地A上蓋物業發展的備置工程範圍 ITEM (1) - EXTENT OF ENABLING WORKS FOR TOPSIDE PROPERTY DEVELOPMENT AT SITE A
- 項目（2）－將來西九文化區發展的備置工程範圍 ITEM (2) - EXTENT OF ENABLING WORKS FOR WEST KOWLOON CULTURAL DISTRICT DEVELOPMENT
- 項目（3）－用地A上蓋物業發展的冷卻喉管 ITEM (3) - COOLING MAINS FOR TOPSIDE PROPERTY DEVELOPMENT AT SITE A

圖則名稱 drawing title
工務計劃項目第57TR號 － 廣深港高速鐵路香港段 － 非鐵路建造工程
備置工程
項目(1)、(2)及(3)
PWP ITEM NO. 57TR - HONG KONG SECTION OF GUANGZHOU-SHENZHEN-HONG KONG EXPRESS RAIL LINK - CONSTRUCTION OF NON-RAILWAY WORKS
ENABLING WORKS
ITEM (1), (2) & (3)

S. H. LAM 23/11/09
總工程師 CHIEF ENGINEER 日期 DATE

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附件 3 （3張中的第3張）
ENCLOSURE 3 (SHEET 3 OF 3)

深盛道 SHAM SHING ROAD
興華街西 HING WAH STREET WEST
東京街西 TONKIN STREET WEST
欽州街西 YEN CHOW STREET WEST
深旺道 SHAM MONG ROAD

圖例
LEGENDS:

- 廣深港高速鐵路方案界線 BOUNDARY OF XRL SCHEME
- 擬建廣深港高速鐵路隧道 PROPOSED XRL TUNNEL
- 規劃中的公眾行人天橋佈局 PROPOSED LAYOUT OF THE PLANNED FOOTBRIDGES
- 深旺道未來行人天橋的備置工程（1.2米／2米直徑鑽孔樁） ENABLING WORKS FOR FUTURE FOOTBRIDGES AT SHAM MONG ROAD (1.2m / 2.0m DIA. BORED PILES)

米 0 50 100 150 200 250 m
比例尺 1 : 5 000 SCALE BAR

興華街西 HING WAH STREET WEST
深旺道 SHAM MONG ROAD

米 0 25 50 75 m
比例尺 1 : 1 500 SCALE BAR

東京街西 TONKIN STREET WEST
深旺道 SHAM MONG ROAD

米 0 25 50 75 m
比例尺 1 : 1 500 SCALE BAR

欽州街西 YEN CHOW STREET WEST
深旺道 SHAM MONG ROAD

米 0 25 50 75 m
比例尺 1 : 1 500 SCALE BAR

圖則名稱 drawing title
工務計劃項目第57TR號 — 廣深港高速鐵路香港段 — 非鐵路建造工程
備置工程
項目（4） — 深旺道未來行人天橋的備置工程
PWP ITEM NO. 57TR - HONG KONG SECTION OF GUANGZHOU-SHENZHEN-HONG KONG EXPRESS RAIL LINK - CONSTRUCTION OF NON-RAILWAY WORKS ENABLING WORKS
ITEM (4) - ENABLING WORKS FOR FUTURE FOOTBRIDGES AT SHAM MONG ROAD

S. H. LAM 23/11/09
總工程師 CHIEF ENGINEER 日期 DATE

設計 designed	K. WONG	23/11/09
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圖號 drawing no. HRWXRL002-SP0013

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Annex E

List of Abbreviations

XRL	Hong Kong section of the Guangzhou-Shenzhen-Hong Kong Express Rail Link
CTC	Cost to Complete
E&M	electrical and mechanical
EA	Entrustment Agreement
FC	Legislative Council Finance Committee
HyD	Highways Department
IBC	Independent Board Committee
LegCo	Legislative Council
M&V	Monitoring and Verification
MTRCL	MTR Corporation Limited
PMC	Project Management Cost
PTC	Programme to Complete
PWSC	Legislative Council Finance Committee Public Works Subcommittee
QSRA	Quantitative Schedule Risk Analysis
RSC	Legislative Council Panel on Transport Subcommittee on Matters Relating to Railways
SEB	Station Entrance Building
T&C	Testing and commissioning
WKT	West Kowloon Terminus