

For discussion  
on 19 December 2006

PWSC(2006-07)51

## **ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE**

### **HEAD 706 - HIGHWAYS**

#### **Transport – Roads**

#### **582TH – Central Kowloon Route – consultants' design fees and site investigations**

Members are invited to recommend to Finance Committee to increase the approved project estimate for **582TH** from \$99.0 million by \$93.3 million to \$192.3 million in money-of-the-day prices.

### **PROBLEM**

The approved project estimate (APE) of **582TH** is not sufficient to cover the cost of the work under the project.

### **PROPOSAL**

2. The Director of Highways (DH<sub>y</sub>), with the support of the Secretary for the Environment, Transport and Works, proposes to increase the APE of **582TH** from \$99.0 million by \$93.3 million to \$192.3 million in money-of-the-day (MOD) prices.

### **PROJECT SCOPE AND NATURE**

3. The approved scope of **582TH** comprises the detailed design consultancy and associated site investigations for the Central Kowloon Route (CKR) project. In 1999, we completed engineering review and associated site

/investigations .....

investigations for the original alignment of CKR which adopted a dual two-lane configuration (hereinafter referred to as the first consultancy agreement and the first site investigation contract).

## JUSTIFICATION

4. The original alignment of CKR was a 3.9-kilometre (km) trunk road with about 2.6 km of dual two-lane tunnel connecting the existing Yau Ma Tei Interchange in the west with the proposed road network under the original scheme of the then South East Kowloon Development (SEKD) (now known as Kai Tak Development) in the east. However, owing to changes in the scheme for Kai Tak Development that took place in the past few years, we need to revise the alignment of CKR. We also consider there is a need for adopting a dual three-lane configuration to meet the anticipated traffic demand between east and west Kowloon. Plans showing the original and revised alignments of CKR being considered and the typical sections of the tunnel are at **Enclosure 1**.

5. We have already spent \$56.3 million on the engineering review of the CKR and its associated site investigations under **582TH**. Following the review of the implementation programme and financial situation, we consider it necessary to increase the APE of **582TH** from \$99.0 million by \$93.3 million to \$192.3 million to cover the additional cost arising from the following –

- (a) revision of the alignment which results in an increase in the length of CKR and its tunnel by about 21% and 46% respectively;
- (b) change in the lane configuration from dual two-lane to dual three-lane; and
- (c) use of immersed tube tunnel for the portion across the water of Kowloon Bay.

Details of the increase in cost are set out in paragraphs 6 to 9 below.

/Revised .....

### Revised alignment

6. In view of the change in the SEKD scheme (see paragraph 25 below), Highways Department commenced in August 1999 an alternative alignment study focusing on the alignment of CKR to the east of Ho Man Tin and worked out a revised alignment passing through the bus terminus at Kowloon City Ferry Pier to match with the revised SEKD scheme. The revised alignment allows the tunnel to run at a greater depth within the bedrock stratum, thus substantially reducing the effects of tunnel construction on existing buildings, roads and services in the To Kwa Wan area. It can accommodate the tunnel in a conventional side-by-side configuration, and is capable of expanding to dual three-lane without involving significant additional land resumption or reprovisioning requirement. The approximate length of the CKR in its revised alignment is now 4.7 km, in which an approximate length of 3.8 km will be in the form of tunnel. The length of CKR and that of its tunnel are longer than those in the original alignment by about 21% and 46% respectively. The pre-construction works on the revised alignment will result in an additional cost of about \$47.4 million.

### Change in lane configuration from dual two-lane to dual three-lane

7. In April 2002, the Transport Department (TD) carried out a traffic review on the dual two-lane CKR option. The results indicated that the dual two-lane CKR would be operating above capacity during peak periods immediately after its opening. In September 2006, TD re-assessed and affirmed the need for a dual three-lane CKR. The projected volume to capacity (V/C) ratios<sup>1</sup> of major east-west road links in 2016 and 2021, with and without the CKR, are as follows –

*V/C .....*

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<sup>1</sup> A v/c ratio is normally used to reflect traffic situation during peak hours. A v/c ratio below 1.0 is considered acceptable. A v/c ratio above 1.0 indicates the onset of mild congestion and a v/c ratio between 1.0 and 1.2 would indicate a manageable degree of congestion. A v/c ratio above 1.2 indicates the onset of more serious congestion.

V/C Ratio	Without CKR (without widening of GRF)	With dual two-lane CKR (assuming widening of GRF together with CKR)		With dual three-lane CKR (assuming widening of GRF together with CKR)	
	2016	2016	2021	2016	2021
CKR	-	1.1	1.2	0.9	0.9
Gascoigne Road Flyover (GRF) <sup>2</sup>	>1.3	1.0	1.1	0.9	0.9
Chatham Road North	>1.3	0.9	1.0	0.9	0.9
Lung Cheung Road	1.3	1.0	1.1	1.0	1.0
Waterloo Road	1.3	1.0	1.1	1.0	1.1
Other major roads parallel to CKR <sup>3</sup>	1.2	0.9	1.0	0.9	0.9

8. Given the one-off opportunity to build this tunnel, we proposed to adopt a dual three-lane tunnel configuration to cope with the anticipated traffic demand. The study on the change of lane configuration will result in an additional cost of about \$27.5 million.

### Use of immersed tube tunnel

9. In the light of the judgment of the Court of Final Appeal (CFA) on

/9 .....

<sup>2</sup> The existing GRF runs through Yau Ma Tei Multi-storey Carpark Building (YMTMCB). With the demolition of YMTMCB under the CKR project, we undertake to investigate the feasibility of the widening of GRF from single two-lane to dual two-lane standard under a separate project. We plan to complete the widening works in association with CKR in 2016.

<sup>3</sup> Other major routes parallel to CKR include Argyle Street, Boundary Street and Prince Edward Road West.

9 January 2004 regarding the Protection of Harbour Ordinance (Cap. 531)<sup>4</sup>, the Administration undertook to re-plan the Kai Tak Development and review the relevant works proposals including the concerned portion of CKR to ensure that the development would be in full compliance with the CFA requirements. In order to avoid reclamation, our present proposal is to build underneath the seabed the portion of CKR in Kowloon Bay between Kowloon City Ferry Pier and Kai Tak Runway in the form of an immersed tube tunnel. The pre-construction works relating to the immersed tube tunnel will result in an additional cost of about \$14.2 million.

10. We need to carry out investigation, impact assessments and preliminary design to confirm the feasibility of the revised alignment of the dual three-lane CKR before we can embark on the detailed design of CKR. Subject to approval, we plan to start the investigation, impact assessment and preliminary design for the revised alignment of CKR in March 2007 for completion in July 2008. We will then start the detailed design for completion in 2011 to enable commencement of construction of CKR in 2012 for completion by 2016.

### Overall Review

11. A breakdown of the proposed increase of \$93.3 million is as follows –

<b>Factors</b>	<b>Proposed increased amount in MOD prices (\$ million)</b>	<b>% of the total increased amount</b>
Additional costs associated with –		

/(a) .....

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<sup>4</sup> CFA clarified that the presumption against reclamation in section 3 of the Protection of Harbour Ordinance could only be rebutted if a single test, that was, “the overriding public need test”, could be satisfied. Public needs are community needs and include the economic, environmental and social needs of the community. A need should only be regarded as overriding if it is a compelling and present need and there is no reasonable alternative to reclamation.

Factors	Proposed increased amount in MOD prices (\$ million)	% of the total increased amount
(a) Revision to alignment with an increase in the length of CKR and its tunnel by about 21% and 46% respectively	47.4	50.8%
(b) Change of lane configuration from dual two-lane to dual three-lane	27.5	29.5%
(c) Use of immersed tube tunnel for the portion across the waters of Kowloon Bay	14.2	15.2%
(d) Adjustment of contingencies	4.2 <sup>5</sup>	4.5%
<b>Total</b>	<b>93.3</b>	<b>100.0</b>

\_\_\_\_\_ A comparison of the cost breakdown of the APE and the revised project estimate  
\_\_\_\_\_ in MOD prices, together with reasons leading to the proposed increase in the  
APE, is at **Enclosure 2**. A breakdown of the estimate for consultants' fees is at  
**Enclosure 3**.

## FINANCIAL IMPLICATIONS

12. Subject to approval, we will revise the phasing of the expenditure as follows –

/Year .....

<sup>5</sup> The original contingencies in the APE are \$8.2 million. The increase of \$4.2 million is for a total of \$12.4 million allowed for the remaining works.

Year	\$ million (MOD)
Up to 31 March 2006	56.3 <sup>6</sup>
2007 – 2008	15.1
2008 – 2009	24.6
2009 – 2010	36.2
2010 – 2011	37.1
2011 – 2012	17.2
2012 – 2013	5.8
	192.3

13. We have derived the MOD estimate on the basis of the Government's latest forecast of trend rate of change in the prices of public sector building and construction output for the period 2007 to 2013. We intend to first employ a consultant for the investigation, impact assessments and preliminary design and later employing another consultant for the detailed design work. We will employ these consultants on lump-sum basis, with provision for price fluctuation as the duration of the consultancies will exceed 12 months. These consultants will supervise the site investigation works under contracts to be awarded in the investigation and detailed design stages through a competitive tendering process.

14. The proposed design and site investigation works will not give rise to any recurrent expenditure.

## **PUBLIC CONSULTATION**

15. We informed the Legislative Council (LegCo) Panel on Transport in June 2001 of the revised alignment for CKR. We then consulted the Panel on the revised alignment and dual three-lane configuration of CKR on 26 April 2002. Members supported the revised alignment and dual three-lane configuration of CKR.

/16. ....

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<sup>6</sup> This is the actual expenditure up to 31 March 2006.

16. We consulted the Traffic and Transport Committees of the Yau Tsim Mong District Council (DC), Kowloon City DC and Kwun Tong DC on 7 September, 28 September and 19 October 2006 on the revised alignment respectively. All three supported the implementation of the CKR project.

17. We consulted the LegCo Panel on Transport again on 24 November 2006. Members supported the proposed increase in APE for the project.

### **ENVIRONMENTAL IMPLICATIONS**

18. CKR is a designated project under Schedule 2 of the Environmental Impact Assessment (EIA) Ordinance (Cap. 499). An environmental permit is required for the construction and operation of the project. We will carry out an EIA study and submit the EIA report to the Director of Environmental Protection for approval under the EIA Ordinance.

19. The proposed design work will not give rise to any adverse environmental implications. We will implement standard environmental pollution control measures to manage the environmental impacts of the associated site investigation works. The site investigation works will only generate a negligible amount of construction and demolition (C&D) materials. We will require the design consultants to fully consider measures to minimise the generation of C&D materials and to reuse/recycle C&D materials as much as possible in the future implementation of the CKR.

### **LAND ACQUISITION**

20. The proposed design and site investigation works do not require any land acquisition. However, land acquisition will be required for the construction of the CKR project. We will ascertain the details of the land requirements in the detailed design stage.

**/BACKGROUND .....**



**BACKGROUND INFORMATION**

21. The east-west traffic movements across central Kowloon are primarily served by Lung Cheung Road, Boundary Street, Prince Edward Road West, Argyle Street, Waterloo Road, GRF and Chatham Road North. Most of these routes are already operating at full capacity at peak hours. Apart from Lung Cheung Road and GRF, the rest of these existing east-west road links have frequent frontage accesses and signal controlled junctions, which are constraining the traffic flows of these road links.

22. The proposed CKR will connect West Kowloon with the proposed Kai Tak Development and the road network in Kowloon Bay. It will provide a new strategic road link across central Kowloon and relieve traffic congestion at peak hours on the existing east-west road links.

23. In April 1998, Finance Committee approved the upgrading of **582TH** “Central Kowloon Route – consultants’ design fees and site investigations” to Category A at an estimated cost of \$99.0 million in MOD prices.

24. We started the engineering review of CKR in its original alignment and dual two-lane configuration in June 1998 and the review was completed in September 1999.

25. In September 1998, when the engineering review of CKR was underway, the Administration gazetted the original SEKD scheme under the Town Planning Ordinance (Cap. 131). In response to the public’s views, the Administration prepared an outline concept plan in June 1999 for the revised scheme of SEKD reducing the extent of reclamation from 299 to 161 hectares. In the light of this revised scheme, we started studying an alternative alignment for CKR in August 1999 and identified the option which passes through the bus terminus at Kowloon City Ferry Pier to match with the revised SEKD scheme.

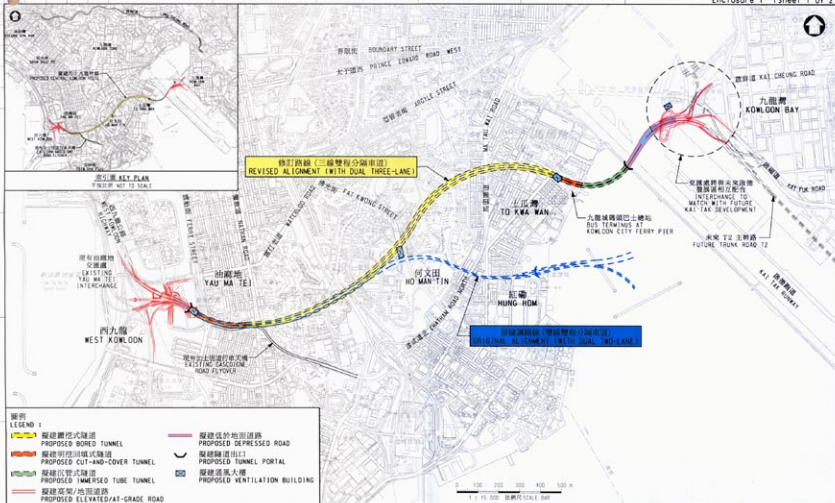
26. Subsequent to the judgement of the Court of Final Appeal in January 2004, the Kai Tak Planning Review was commissioned in July 2004, with "no reclamation" as the starting point. The Kai Tak Planning Review concluded that part of CKR would be built in the form of an immersed tube tunnel across the waters of Kowloon Bay to avoid reclamation.

27. The proposed design and site investigation works will not involve any tree removal or planting proposals. We will require the consultants to take into consideration the need for tree preservation during the investigation and design stages of the project. We will also incorporate tree planting proposals, where possible, when the CKR project is implemented.

28. We estimate that the proposed increase in APE for the remaining works will create about 170 jobs (90 for labourers and another 80 for professional/technical staff), providing a total employment of 2 900 man-months.

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Environment, Transport and Works Bureau  
December 2006



**圖例**  
LEGEND 1

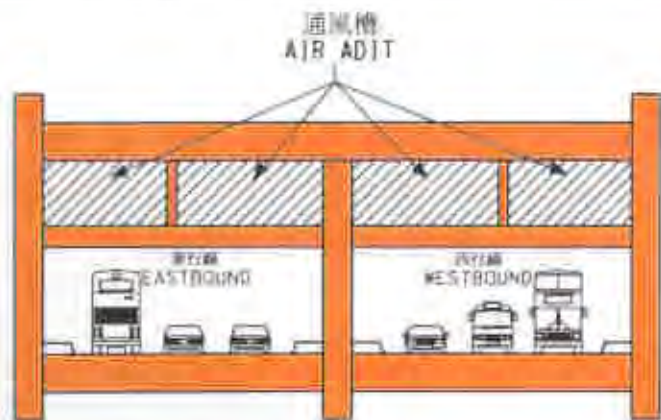
	擬建鑽挖式隧道 PROPOSED BORED TUNNEL		擬建低於地面道路 PROPOSED DEPRESSED ROAD
	擬建明挖埋蓋式隧道 PROPOSED CUT-AND-COVER TUNNEL		擬建隧道出口 PROPOSED TUNNEL PORTAL
	擬建沉管式隧道 PROPOSED IMMERSED TUBE TUNNEL		擬建通風大樓 PROPOSED VENTILATION BUILDING
	擬建高架/地面道路 PROPOSED ELEVATED/AT-GRADE ROAD		

圖則名稱 drawing title  
 工程計劃項目第 582TH 號 - 中九龍幹線 - 顧問設計費及地盤勘测工作  
 位置圖  
 PWP ITEM NO. 582TH - CENTRAL KOWLOON ROUTE - CONSULTANTS' DESIGN FEES AND SITE INVESTIGATIONS  
 LOCATION PLAN

設計 designed	SIGNED	繪圖 drawn	SIGNED
C.L.C.L.M	16/11/06	W.L.L.M	16/11/06
資料 checked	SIGNED	註冊 approved	SIGNED
W.C.L.M.M	16/11/06	M.T.M	16/11/06

主要工程督理  
MAJOR WORKS PROJECT MANAGEMENT OFFICE

圖則編號 drawing no.	比例 scale
HNW6582TH-SP0003	1:15000 (原尺 1:5000)
© 版權所有 COPYRIGHT RESERVED	
HIGHWAYS DEPARTMENT 路政處 HONG KONG	



典型明挖回填式隧道橫切面  
TYPICAL SECTION FOR CUT-AND-COVER TUNNEL



典型鑽挖式隧道橫切面  
TYPICAL SECTION FOR BORED TUNNEL

現有海床水平  
EXISTING SEABED LEVEL

通風槽  
AIR ADIT



通風槽  
AIR ADIT

典型沉管式隧道橫切面  
TYPICAL SECTION FOR IMMERSED TUBE TUNNEL

圖則名稱 drawing title

工務計劃項目第 582TH 號 - 中九龍幹線 - 顧問設計費及地盤勘測工作  
中九龍幹線典型隧道橫切面  
PWP ITEM NO. 582TH - CENTRAL KOWLOON ROUTE  
- CONSULTANTS' DESIGN FEES AND SITE INVESTIGATIONS  
TYPICAL SECTION FOR TUNNELS OF THE CENTRAL KOWLOON ROUTE

設計 designed  
SIGNED  
C.K.LAM 16/11/06

繪圖 drawn  
SIGNED  
W.L.LAM 16/11/06

圖則編號 drawing no.  
HMW6582TH-SP0004

比例 scale  
1:100  
NOT TO SCALE

覆核 checked  
SIGNED  
W.C.KHAN 16/11/06

批准 approved  
SIGNED  
M.Y.MA 16/11/06

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主要工程管理部  
MAJOR WORKS  
PROJECT MANAGEMENT OFFICE



HIGHWAYS  
DEPARTMENT  
HONG KONG

路政署  
HONG KONG

## Enclosure 2 to PWSC(2006-07)51

### 582TH – Central Kowloon Route – consultants’ design fees and site investigations

A comparison of the APE and the revised project estimate in MOD prices is as follows –

	(i) APE Break-down <sup>1</sup>  (\$M)	(ii) First Consultancy Agreement and First Site Investigation Contract		(iii) Estimate for Remaining Work  (\$M)	(iv) Revised Total Estimate (ii)(b)+(iii)  (\$M)	(v) Difference (iv) – (i)  (\$M)
		(a) Revised Estimate (based on tender sums) (\$M)	(b) Actual Expend- iture <sup>2</sup> (\$M)			
(a) Consultants’ fees	63.3	63.9 <sup>3</sup>	36.7	76.5	113.2	49.9
(i) Review (including the engineering review in the first consultancy agreement, investigation, impact assessments and preliminary design)	15.0	31.8	34.0	16.7	50.7	35.7
(ii) Detailed design	42.8	27.4	-	50.6	50.6	7.8
(iii) Preparation of tender document	3.4	2.6	-	4.9	4.9	1.5
(iv) Supervision of site investigations	2.1	2.1 <sup>4</sup>	2.7	4.3	7.0	4.9

<sup>1</sup> This is inclusive of the inflation allowance, which is spread over different items of work and contingencies.

<sup>2</sup> This is the total final payment for the first consultancy agreement and the first site investigation contract. Due to the change in project scope and the deviation from the original implementation programme for CKR, DHy terminated the first consultancy agreement in 2002.

<sup>3</sup> This is based on the breakdown of manpower input in the consultants’ bid for the first consultancy agreement.

<sup>4</sup> This amount represents the provision for supervision of site investigations comprising a sum of \$1.5 million for engineering review and another sum of \$0.6 million for detailed design.

	(i) APE Break- down <sup>1</sup>  (\$M)	(ii) First Consultancy Agreement and First Site Investigation Contract		(iii) Estimate for Remaining Work  (\$M)	(iv) Revised Total Estimate (ii)(b)+(iii)  (\$M)	(v) Difference (iv) – (i)  (\$M)
		(a) Revised Estimate (based on tender sums) (\$M)	(b) Actual Expend- iture <sup>2</sup> (\$M)			
(b) Site investigations	27.5	27.5 <sup>5</sup>	19.6	47.1	66.7	39.2
(c) Contingencies	8.2	7.6 <sup>6</sup>	-	12.4	12.4	4.2 <sup>7</sup>
Total	99.0	99.0	56.3	136.0	192.3	93.3

2. As regards **(a)(i) (consultants' fees for review)**, the total increase of \$35.7 million comprises –

- (i) an increase of \$19.0 million due to the higher than expected consultants' fees for the completed engineering review for the original alignment and review of the alternative alignment; and
- (ii) an increase of \$16.7 million due to the change in CKR scheme as mentioned in paragraphs 6 to 9 of the paper.

3. As regards **(a)(ii) (consultants' fees for detailed design)**, the increase of \$7.8 million results from an increase of \$23.2 million for the detailed design due to the change in CKR scheme as mentioned in paragraphs 6 to 9 of the paper.

4. As regards **(a)(iii) (consultants' fees for preparation of tender document)**, the increase of \$1.5 million results from an increase of \$2.3 million due to the change in CKR scheme as mentioned in paragraphs 6 to 9 of the paper.

5. As regards **(a)(iv) (consultants' fees for supervision of site investigations)**, the increase of \$4.9 million results from an increase of \$1.2 million for the supervision of the completed site investigation works due to higher

<sup>5</sup> This comprises the estimated cost of \$20.1 million based on the first site investigation contract and another sum of \$7.4 million for further site investigation at detailed design stage.

<sup>6</sup> It represents a drawdown of \$0.6 million from the contingencies to offset the higher consultants' fees based on the tender sums of the first consultancy agreement.

<sup>7</sup> This represents a sum of \$4.2 million for the increase in the original contingencies, as mentioned in paragraph 11(d) of the paper.

than expected fees in the first consultancy agreement and an increase of \$4.3 million for remaining works, offset by the unspent fee of \$0.6 million allowed for detailed design stage.

6. As regards **(b) (site investigations)**, the total increase of \$39.2 million comprises-

- (i) an increase of \$30.0 million due to additional site investigations on land required for the revised alignment and change in lane configuration of the CKR; and
- (ii) an increase of \$9.2 million due to marine site investigations required for the design of the immersed tube tunnel.

7. As regards **(c) (contingencies)**, we allow a sum of \$12.4 million as contingencies associated with the remaining work.

**582TH – Central Kowloon Route – consultants’ design fees and site investigations**

**Breakdown of estimate for remaining consultants’ fees (in MOD prices)**

<b>Consultants’ staff costs</b>	<b>Estimated fee (Note 2) (\$million)</b>
(a) Investigation, impact assessments and preliminary design	16.7
(b) Detailed design	50.6
(c) Preparation of tender document and assessment of tenders	4.9
(d) Supervision of site investigations	4.3
Total consultants’ staff costs	76.5
<b>Out-of-pocket expenses</b>	
(Note 1)	
Site investigations	47.1
<b>Total</b>	<b>123.6</b>

**Notes**

1. Out-of-pocket expenses are the actual costs incurred. The consultants are not entitled to any additional payment for overheads or profit in respect of these items.
  
2. The figures given above are based on estimates prepared by the Director of Highways. We will know the actual man-months and actual fees only when we have selected the consultants through the usual competitive lump-sum fee bid system.