For discussion **PWSC(2000-01)60**
on 8 November 2000

ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

HEAD 706 - HIGHWAYS
Transport - Roads
720TH - Widening of Tolo Highway/Fanling Highway between Island House Interchange and Fanling

Members are invited to recommend to Finance Committee -

(a) to upgrade part of **720TH**, entitled "Widening of Tolo Highway/Fanling Highway between Island House Interchange and Fanling - detailed design and ground investigation" to Category A at an estimated cost of $71.9 million in money-of-the-day prices; and

(b) to retain the remainder of **720TH** in Category B.

PROBLEM

The section of the existing Tolo Highway and Fanling Highway between Island House Interchange and Fanling will not be able to cope with future traffic. Also, there is no traffic control and surveillance system along the section of Tolo Highway and Fanling Highway between Ma Liu Shui Interchange and Fanling to facilitate efficient traffic management and speedy response to incidents.

/ **PROPOSAL** .....

PROPOSAL

2. The Director of Highways, with the support of the Secretary for Transport, proposes to upgrade part of **720TH** to Category A at an estimated cost of $71.9 million in money-of-the-day (MOD) prices to employ consultants to undertake detailed design for the widening of the section of Tolo Highway and Fanling Highway between Island House Interchange and Fanling, and the associated traffic control and surveillance system for sections of the highways between Ma Liu Shui Interchange and Fanling, and to carry out the ground investigation.

PROJECT SCOPE AND NATURE

3. The scope of works for **720TH** includes -

(a) widening a 3.9-kilometre section of the Tolo Highway and a 2.8-kilometre section of the Fanling Highway between the Island House Interchange and Fanling from the existing dual three-lane to a dual four-lane carriageway;

(b) widening the highway interchange sections at Island House Interchange, Tai Po North Interchange and the Lam Kam Road Interchange from dual two-lane to dual three-lane including realigning the various slip roads, and widening the southbound carriageway at Tai Po North Interchange from two to four lanes;

(c) improving the existing merging arrangements at the southbound carriageway of the Wo Hop Shek Interchange;

(d) modifying and reconstructing the highway overbridges, underpasses and box culverts intersecting the highways;

(e) providing a traffic control and surveillance system (TCSS) from Ma Liu Shui Interchange to Fanling; and

(f) undertaking associated civil, structural, geotechnical, landscape, drainage and street lighting works, traffic aids (including sign gantries), fire hydrants, electrical and mechanical installations, and environmental mitigation measures.

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4. The part of the project we now propose to upgrade to Category A comprises -

(a) detailed design of the proposed works described in paragraph 3 above;

(b) preparation of tender documents and assessment of tenders; and

(c) associated ground investigation and supervision.

A site plan is at Enclosure 1.

5. We plan to start the detailed design and ground investigation works in March 2001 for completion in mid 2003. We aim to commence construction works relating to the Tolo Highway in mid 2003 and those relating to Fanling Highway in early 2004, for overall completion by end 2006.

JUSTIFICATION

6. The Tolo Highway and the Fanling Highway form a strategic road link serving the Northeast New Territories and cross boundary traffic. In recent years, traffic during peak hours has reached the design capacities for these highways. Traffic queues stretching from Island House Interchange up to Tai Po North Interchange are typical during morning peaks.

7. Given developments in the northern part of the New Territories, we project that the population in the Tai Po, Fanling, Sheung Shui, Yuen Long, Tuen Mun and Tin Shui Wai areas will increase from 1 480 000 in 1999 to 2 400 000 in 2016. Furthermore, we forecast that the cross boundary traffic will register an annual growth of 9%, increasing the average daily traffic from 28 300 vehicles in 1999 to about 120 000 vehicles in 2016. The projected increases in population and cross-boundary traffic would exacerbate the traffic condition on Tolo Highway and Fanling Highway.

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8. The following table shows the projected volume/capacity[1] (V/C) ratios during peak hours with and without the proposed widening works -

V/C Ratio of Tolo Highway between Island House and Hong Lok Yuen

	Year			
	2000	**2006**	**2011**	**2016**
Without the proposed widening works	0.89	1.15	1.37	1.52
With the proposed widening works	-	0.86	1.03	1.14

V/C Ratio of Fanling Highway between Hong Lok Yuen and Fanling

	Year			
	2000	**2006**	**2011**	**2016**
Without the proposed widening works	0.97	0.99	1.23	1.31
With the proposed widening works	-	0.74	0.92	0.98

9. In order to alleviate the forecast congestion problems and to meet the traffic demand up to at least 2016, we propose to widen sections of Tolo Highway and Fanling Highway from dual three-lane to dual four-lane. We also plan to widen the highway interchange sections described in paragraph 3(b) above from dual two-lane to dual three-lane, and to provide a total of four lanes for the southbound carriageway at Tai Po North Interchange in order to alleviate the capacity and weaving problems of the southbound traffic from Lam Kam Road Interchange.

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[1] The capacity here refers to the design capacity of the road. A V/C ratio equal to or less than 1.0 means that the road has sufficient capacity to cope with the volume of vehicular traffic under consideration. A V/C ratio above 1.0 indicates the onset of mild congestion; above 1.2 indicates more serious congestion with traffic speeds progressively deteriorating.

10. The Study on the provision, management and operation of TCSS facilities for the strategic road network study completed by Transport Department in September 1999 recommended the provision of close circuit television cameras, fibre optic communication cabling, speed enforcement cameras, variable message signs and lane control signals as standard highway furniture for all new and existing highways. As Tolo Highway and Fanling Highway are part of the strategic Route 1 in North-east New Territories, we propose to provide the standard TCSS along these expressways to enhance efficient and effective traffic management and incident management. To ensure the operation of the TCSS as one integrated system for the strategic route, the detailed design of the TCSS will also include a section of Tolo Highway between Ma Liu Shui Interchange and Island House Interchange.

11. The Investigation Assignment for **720TH** started in February 1999. We have already completed the investigation and preliminary design of the road widening works and established its preferred alignment together with the associated land, environmental, drainage, traffic impacts on the affected areas. A ground investigation contract has also been completed during the Assignment to provide some geotechnical information for the preliminary design (see paragraph 23 below).

12. The findings of the Investigation Assignment revealed that the detailed design for the proposed works would be complex and require a variety of expertise inputs. These include mainly the design of bridges, drainage, and geotechnical engineering design of slopes and earth retaining structures. In addition, traffic engineering input to develop traffic management measures and TCSS, as well as environmental engineering input for the implementation of the recommended environmental mitigation measures are also required. Further ground investigation works are needed to provide additional geotechnical information for the detailed design works. As we do not have the necessary in-house resources, we need to employ consultants to undertake the detailed design of the project and to supervise the associated ground investigation works.

FINANCIAL IMPLICATIONS

13. We estimate the capital cost of this part of the project to be $71.9 million in MOD prices (see paragraph 14 below), made up as follows -

/ (a) .....

		$million		
(a)	Consultants' fees		51.7	
	(i) review of preliminary design, detailed design and preparation of tender documents noise barriers	50.0		
	(ii) supervision of ground investigation	0.9		
	(iii) Electrical and Mechanical Services Trading Fund (EMSTF) charges[2]	0.8		
(b)	Ground investigation		10.0	
(c)	Contingencies		6.2	
	Sub-total		67.9	(at September 2000 prices)
(d)	Provision for price adjustment		4.0	
	Total		71.9	(in MOD prices)

A breakdown by man-months of the estimate for consultants' fees is at Enclosure 2.

14. Subject to approval, we will phase the expenditure as follows -

Year	**$ million (Sept 2000)**	**Price Adjustment Factor**	**$ million (MOD)**
2001 - 2002	15.9	1.02550	16.3

/ 2002.....

[2] Upon its establishment from 1 August 1996 under the Trading Funds Ordinance, the EMSTF charges government departments for design and technical consultancy services for electrical and mechanical (E&M) installation. The services rendered for this project include checking consultants' submissions on all E&M installations and providing technical advice to the Government on all E&M works and their impacts on the project.

Year	$ million (Sept 2000)	Price Adjustment Factor	$ million (MOD)
2002 - 2003	35.9	1.05627	37.9
2003 - 2004	9.5	1.08795	10.3
2004 - 2005	6.6	1.12059	7.4
	67.9		71.9

15. We have derived the MOD estimate on the basis of the Government's latest forecast of trend labour and construction prices for the period 2001 to 2005. We will employ consultants on a lump sum basis with provision for price fluctuation as the duration of the detailed design will exceed 12 months. The consultants will supervise the site investigation works under a contract to be awarded through the normal competitive tendering process.

16. The proposed detailed design has no additional annual recurrent financial implications.

PUBLIC CONSULTATION

17. We consulted the Tai Po District Council (TPDC) and its Traffic and Transport Committee (T&TC) on 5 and 14 September 2000 respectively and the T&TC of the North District Council (NDC) on 18 September 2000 on the findings of the investigation and preliminary design for the proposed works under **720TH**. Both District Councils supported the **720TH** project. The TPDC requested us to take measures to complete the noise barriers adjacent to residential development as early as possible and the NDC raised concerns on the traffic impact on Pak Wo Road after modification of the Wo Hop Shek Interchange. We will take into account their requests and concerns in the detailed design.

18. We also consulted the Fanling Rural Committee (FRC) on 9 August 2000 and the Tai Po Rural Committee on 22 September 2000. Both Rural

/ Committees .....

Committees supported the **720TH** project. The FRC raised concerns on the traffic impact as a result of the temporary closure of Kiu Tau Bridge for the bridge reconstruction works as a result of widening of Fanling Highway. We agreed to investigate in the detailed design to shorten the duration of the temporary closure as far as possible.

ENVIRONMENTAL IMPLICATIONS

19. The proposed detailed design and ground investigation works of the project will not give rise to any adverse environmental impacts. As for the project itself, it is a designated project under Schedule 2 of the Environmental Impact Assessment (EIA) Ordinance (Cap. 499) and an environmental permit is required for the construction and operation. We have completed the EIA report for the project in March 2000 and the Advisory Council on the Environment endorsed the report in June 2000. In July 2000, the EIA report for the project was approved under the EIA Ordinance. The EIA report concluded that the environmental impact of the project can be controlled to within the criteria under the EIA Ordinance and the Technical Memorandum on the EIA Process. We shall implement the measures recommended in the approved EIA report. The key measure is the provision of noise barriers at varying heights from two to eight metres high and laying of noise reducing surfaces along specific sections of the road alignment. For short-term construction impacts, we will control noise, dust and site-runoff nuisance to comply with the established guidelines and standards through the implementation of pollution control measures and environmental monitoring and audit programme in the contract.

20. The proposed detailed design and ground investigation works will only generate a very small quantity of construction and demolition materials (C&DM). We will require the consultant conducting the detailed design to fully consider measures to minimize the generation of C&DM and to reuse/recycle C&DM as much as possible in the future implementation of the construction contract.

LAND ACQUISITION

21 The proposed detailed design and ground investigation do not require any land acquisition.

/ BACKGROUND .....

BACKGROUND INFORMATION

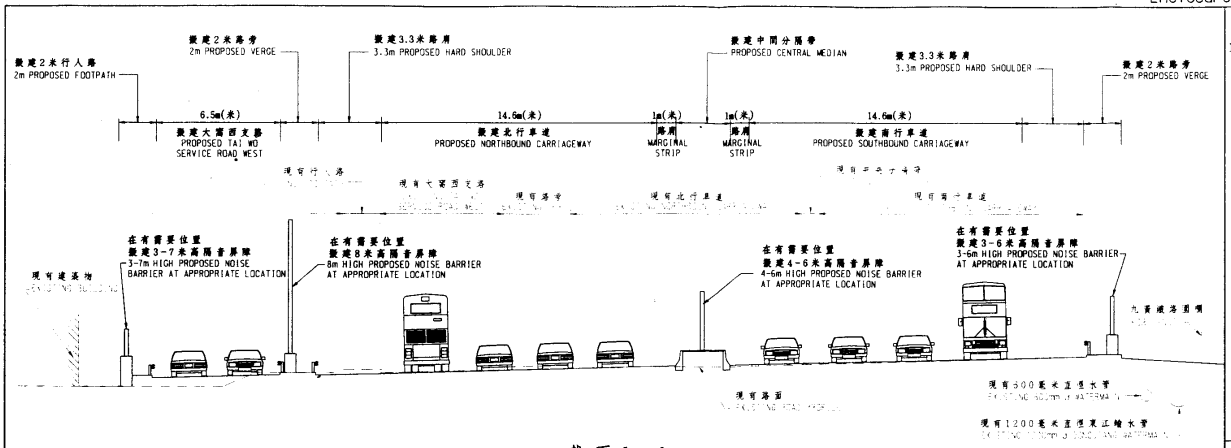
22. In November 1998, we upgraded **561TH** - "Widening of Tolo Highway between Island House Interchange and Ma Liu Shui Interchange" to Category A at an estimated cost of $2,507.2 million in MOD prices for the widening of this road section from dual three-lane to dual four-lane. The construction of this project commenced in March 1999 and is scheduled for completion in mid 2002.

23. We included **720TH** in Category B in September 1998 for the widening of the remaining section of the Tolo Highway from Island House Interchange to Lam Kam Road Interchange and the section of Fanling Highway from Lam Kam Road Interchange to Wo Hop Shek Interchange. In December 1998, we upgraded part of **720TH** to Category A for investigation and preliminary design of the project as **735TH** "Widening of Tolo Highway/Fanling Highway between Island House Interchange and Fanling - studies and preliminary design" at an estimated cost of $27.8 million in MOD prices.

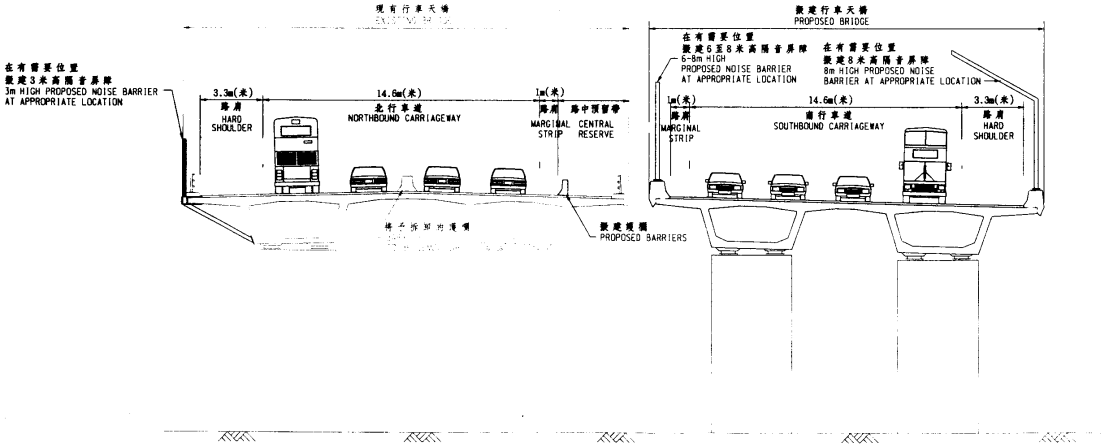
24. We estimate that the proposed ground investigation and detailed design works would create about 50 jobs or 668 man-months, comprising 30 professional/technical staff and 20 labourers.

Transport Bureau
October 2000

Enclosure 1 附件1



截面 1 - 1
SECTION 1 - 1



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SECTION 2 - 2

NOTES : 註釋

1. 此圖需與圖則 PMH6720/1PS/005A一同參閱。
THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH DRAWING NO. PMH6720/1PS/005A.

no.	date	description	initial
A	27/9/00	MINOR REVISION	

REVISION

designed Signed K.W.LEE 07/09/00	drawn Signed L.Y.LEUNG 08/09/00
checked Signed K.W.LEE 20/09/00	approved Signed H.K.YIM 20/09/00

contract no.
合約編號

file no.
檔案編號

project no.
工程編號 6720TH

project title
工程名稱
舊政務司官邸附近道路交匯處與粉嶺之間的吐露港公路/粉嶺公路擴闊工程
WIDENING OF TOLO HIGHWAY / FANLING HIGHWAY BETWEEN ISLAND HOUSE INTERCHANGE AND FANLING

drawing no. 圖號 PMH6720/1PS/006A

scale 比例 1:200

office
MAJOR WORKS PROJECT MANAGEMENT OFFICE
主要工程管理處

HIGHWAYS DEPARTMENT HONG KONG 路政署 香港

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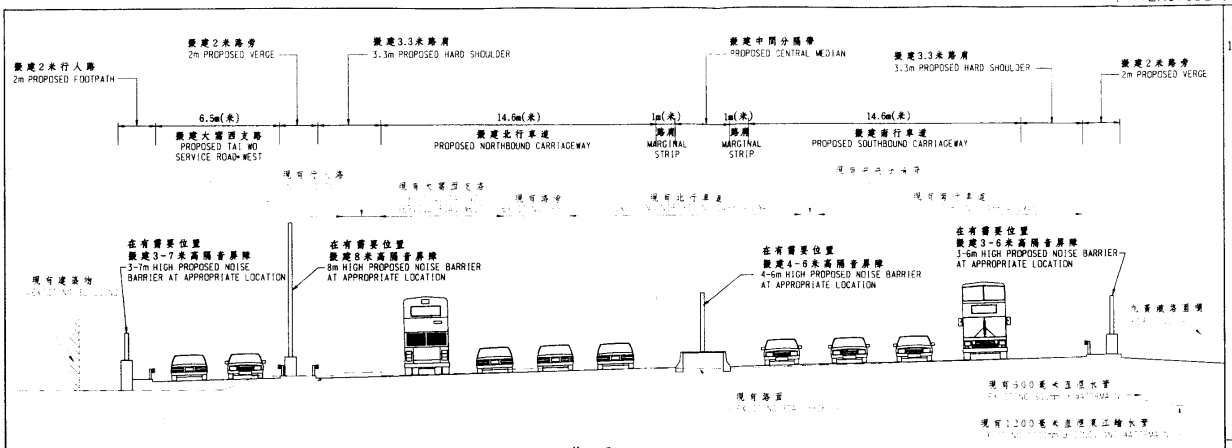

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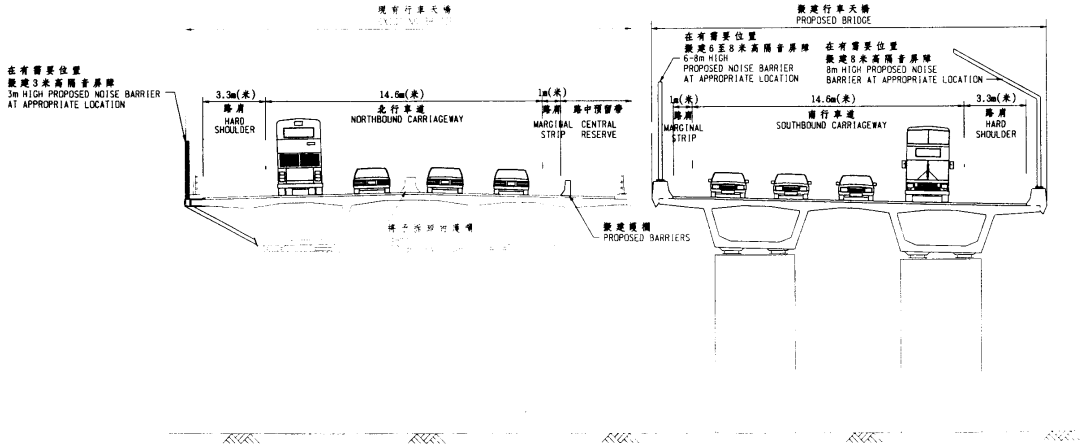
SECTION 1 - 1



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no.	date	description	initial
A	27/9/00	MINOR REVISION	

REVISION

designed Signed	drawn Signed
K.W.LEE 07/09/00	L.Y.LEUNG 08/09/00
checked Signed	approved Signed
K.W.LEE 20/09/00	H.K.YIM 20/09/00

contract no.
合約編號

file no.
檔案編號

project no.
工程編號 6720TH

project title
工程名稱
舊政務司官邸附近道路交匯處與粉嶺之間的吐露港公路/粉嶺公路擴闊工程
WIDENING OF TOLO HIGHWAY / FANLING HIGHWAY BETWEEN ISLAND HOUSE INTERCHANGE AND FANLING

drawing no. 圖號 PMH6720/1PS/006A
scale 比例 1:200

office
MAJOR WORKS PROJECT MANAGEMENT OFFICE
土要工程管理處

HIGHWAYS DEPARTMENT HONG KONG 路政署 香港

720TH - Widening of Tolo Highway/Fanling Highway between Island House Interchange and Fanling

Breakdown of the estimate for consultants' fees (at September 2000 prices)

	Consultants' staff costs		**Estimated man-months**	**Average MPS* salary point**	**Multiplier Factor**	**Estimated fee ($ million)**
(a)	Review of the findings of Investigation and Preliminary Design Assignment (including review of EIA, TIA, DIA & preliminary design)	Professional	50	38	2.4	6.9
		Technical	20	14	2.4	0.9
(b)	Detailed design	Professional	198	38	2.4	27.3
		Technical	280	14	2.4	12.8
(c)	Preparation of tender documents and assessment of tenders	Professional	14	38	2.4	1.9
		Technical	5	14	2.4	0.2
(d)	Supervision of ground investigation	Professional	5	38	1.7	0.5
		Technical	12	14	1.7	0.4
(e)	EMSTF Charges					0.8
		Total consultants' staff costs				51.7
	Out-of-pocket expenses					
(a)	Site investigation					10.0
					Total	61.7

* MPS = Master Pay Scale

Notes

(1) A multiplier factor of 2.4 is applied to the average MPS point to arrive at the full staff costs including the consultants' overheads and profit, as the staff will be employed in the consultant's offices (at 1.4.2000, MPS pt. 38 = $57,525 p.m., and MPS pt. 14 = $19,055 p.m.). A multiplier factor of 1.7 is applied in the case of site staff supplied by the consultants.

(2) Out-of-pocket expenses are the actual cost incurred. The consultants are not entitled to any additional payment for the overheads or profit in respect of these items.

(3) The figures given above are based on estimates prepared by the Director of Highways. We will only know the actual man-months and actual fees when we have selected the consultants through the usual competitive lump sum fee bid system.

(4) Since the establishment of the EMSTF in 1 August 1996 under the Trading Funds Ordinance, government departments are required to pay for design and technical consultancy services for electrical and mechanical (E&M) installations provided by EMSD. The services rendered for this project include checking consultants' submissions on all E&M installations and providing technical advice to the Government on all E&M works and their impacts on the project.