

ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

HEAD 706 – HIGHWAYS

Transport – Roads

722TH – Retrofitting of noise barriers on Fanling Highway near Choi Yuen Estate, Sheung Shui

723TH – Retrofitting of noise barriers on Fanling Highway near Fanling Centre, Fanling

Members are invited to recommend to Finance Committee –

- (a) the upgrading of **722TH** to Category A at an estimated cost of \$101.4 million in money-of-the-day prices for the retrofitting of noise barriers on Fanling Highway near Choi Yuen Estate at Sheung Shui; and
- (b) the upgrading of **723TH** to Category A at an estimated cost of \$64.3 million in money-of-the-day prices for the retrofitting of noise barriers on Fanling Highway near Fanling Centre at Fanling.

PROBLEM

The existing dwellings adjacent to Fanling Highway near Choi Yuen Estate at Sheung Shui and near Fanling Centre at Fanling are exposed to excessive noise generated from Fanling Highway.

/PROPOSAL

PROPOSAL

2. The Director of Highways, with the support of the Secretary for the Environment, Transport and Works, proposes to upgrade **722TH** and **723TH** to Category A at estimated costs of \$101.4 million and \$64.3 million respectively in money-of-the-day (MOD) prices for the retrofitting of noise barriers on Fanling Highway near Choi Yuen Estate at Sheung Shui and near Fanling Centre at Fanling.

PROJECT SCOPE AND NATURE

3. The scope of **722TH** comprises –
- (a) retrofitting of vertical noise barriers of 600 metres in length and four metres in height on both sides of the eastbound section of Fanling Highway between Tai Tau Leng and Choi Yuen Estate;
 - (b) retrofitting of single-leave cantilever noise barriers of 950 metres in length along the slow lanes of both bounds and double-leave cantilever noise barriers of 500 metres in length with a five-metre vertical and three-metre bend along the central divider of the section of Fanling Highway between Po Shek Wu Road and So Kwun Po Road; and
 - (c) associated road, drainage, street lighting and landscaping works.
4. The scope of **723TH** comprises –
- (a) retrofitting of cantilever noise barriers of one kilometre in length with a five-metre vertical and three-metre bend along the central divider and the slow lane of the eastbound section of Fanling Highway between the East Rail Fanling Station and Fanling Centre; and
 - (b) associated road, drainage, street lighting and landscaping works.

Layout plans with cross sections of the proposed noise barriers under **722TH** and **723TH** are at Enclosures 1 and 2 respectively.

5. We have substantially completed the detailed design and working drawings for the projects. We plan to commence the construction works in August 2004 for completion in December 2005.

JUSTIFICATION

6. In November 2000, the Administration introduced a policy to address the noise impact of existing roads on neighbouring residents. Under this policy, direct engineering solutions by way of retrofitting of barriers and enclosures and resurfacing with low noise material will be implemented where practicable at existing excessively noisy roads, i.e. where the noise level exceeds the limit of 70 dB(A) $L_{10}(1 \text{ hour})$ ¹.

7. At present, about 1 600 dwellings adjacent to the section of Fanling Highway near Choi Yuen Estate at Sheung Shui are exposed to excessive traffic noise of up to 82 dB(A) $L_{10}(1 \text{ hour})$ and about 800 dwellings adjacent to the section of Fanling Highway near Fanling Centre at Fanling are exposed to excessive traffic noise of up to 78 dB(A) $L_{10}(1 \text{ hour})$. In line with the policy, we propose to retrofit noise barriers on these road sections in order to mitigate the noise impact.

8. We estimate that about 1 200 dwellings in the vicinity of Fanling Highway near Choi Yuen Estate will benefit² from the retrofitting of noise barriers under **722TH** where the traffic noise at their facades will be reduced by up to 17 dB(A). We estimate that about 800 dwellings in the vicinity of Fanling Highway near Fanling Centre will benefit from the retrofitting of noise barriers under **723TH** where the traffic noise at their facades will be reduced by up to 10 dB(A).

FINANCIAL IMPLICATIONS

9. We estimate the costs of **722TH** and **723TH** to be \$101.4 million

/and

¹ $L_{10}(1 \text{ hour})$ is the noise level exceeded for 10% of a one-hour period, generally used for road noise at peak traffic flow. The noise limit of 70 dB(A) for residential premises as stipulated in the Hong Kong Planning Standards and Guidelines is adopted as the administrative guideline for retrofitting projects identified under the policy introduced in 2000.

² A dwelling that will benefit from the retrofitting works is one being exposed to traffic noise above 70 dB(A) $L_{10}(1 \text{ hour})$ and its mitigated noise level is reduced by more than 1 dB(A) after implementation of the retrofitting project.

and \$64.3 million respectively in MOD prices (see paragraph 10 below), made up as follows –

	\$ million	
	722TH	723TH
(a) Noise barriers ³	69.8	47.2
(i) vertical	19.5	
(ii) single-leave cantilever	34.5	47.2
(iii) double-leave cantilever	15.8	
(b) Road and drainage works	14.8	5.0
(c) Landscaping works	2.9	2.8
(d) Consultant fees	8.7	6.0
(i) construction supervision and contract administration	0.8	0.6
(ii) resident site staff costs	7.6	5.2

/(iii)

³ 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 in November 1998. We substantially completed the construction works in August 2003. Noting that some of the noise barriers under **561TH** could be removed or deferred, Members suggested at the meetings of the Legislative Council (LegCo) Panel on Transport held on 22 November 2002 and 28 February 2003 (see paragraph 13 below) that those noise barriers should be relocated elsewhere. We undertook at the joint meeting of the LegCo Panel on Environmental Affairs and Panel on Transport held on 23 June 2003 to reuse the noise barrier materials in **722TH** and **723TH**. The estimate for item (a) has taken into account savings of \$4.8 million for **722TH** and \$6.3 million for **723TH** from the reuse of noise barrier materials recovered from **561TH**.

	\$ million		
	0.3	0.2	
(iii) environmental monitoring and audit (EM&A) programme ⁴			
(e) Contingencies	9.6	6.1	
Sub-total	105.8	67.1	(in September 2003 prices)
(f) Provision for price adjustment	(4.4)	(2.8)	
Total	101.4	64.3	(in MOD prices)

A breakdown of the estimated consultant fees for **722TH** and **723TH** is at Enclosure 3.

10. Subject to approval, we will phase the expenditure as follows –

Year	\$ million (Sept 2003)		Price adjustment factor	\$ million (MOD)	
	722TH	723TH		722TH	723TH
2004 – 05	25.9	17.8	0.97150	25.1	17.3
2005 – 06	73.3	45.2	0.95450	70.0	43.1
2006 – 07	6.6	4.1	0.95450	6.3	3.9
	105.8	67.1		101.4	64.3

/11.

⁴ We will engage consultants to implement an EM&A programme at estimated costs of \$300,000 for **722TH** and \$200,000 for **723TH** to ensure timely and effective implementation of the recommended mitigation measures.

11. We have derived the MOD estimates 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 2004 to 2007. We will tender the proposed works under **722TH** and **723TH** under a standard remeasurement contract because the quantity of the foundation of noise barriers is subject to variation due to actual ground conditions. The contract will not provide for price adjustments as the contract period will not exceed 21 months.

12. We estimate the annual recurrent expenditure upon completion of **722TH** and **723TH** to be \$514,000 and \$212,000 respectively.

PUBLIC CONSULTATION

13. On 23 June 2003, we consulted the LegCo Panel on Environmental Affairs and Panel on Transport on **722TH** and **723TH** which involved the proposed reuse of the noise barrier materials recovered from **561TH** "Widening of Tolo Highway between Island House Interchange and Ma Liu Shui Interchange". In addition to information about the scope, design, and implementation timetable of **722TH** and **723TH**, we used computer animation at the meeting to illustrate the visual effects of the proposed colour scheme of the noise barrier panels. Members supported the proposal and advised the Administration to consult the North District Council.

14. We subsequently consulted the North District Council on **722TH** and **723TH** and the aesthetic design of the proposed noise barriers on 31 July 2003. We briefed Members on the details of the projects, including the scope, design and colour scheme of the noise barriers panels, and the implementation table. Members supported the projects and the aesthetic design.

15. We gazetted the road scheme of **722TH** under the Roads (Works, Use and Compensation) Ordinance (the Ordinance) on 24 October 2003 and received one objection. The objector requested the Administration to extend the proposed noise barriers along the Fanling Highway to the fronting of his lot. The objector withdrew his objection unconditionally after we explained to him that the developer of the lot had incorporated noise mitigation measures into the building design of the development as required under the lease conditions. The Permanent Secretary for the Environment, Transport and Works (Environment and Transport), under the delegated authority from the Secretary for the Environment, Transport and Works, authorised the road scheme of **722TH** under the Ordinance on 30 April 2004. The notice of authorisation was gazetted on 7 May 2004.

16. We gazetted the road scheme of **723TH** under the Ordinance on 24 October 2003 and received two objections. Both objectors requested the Administration to provide noise barriers along the section of Fanling Highway fronting Avon Park. In addition, one of the objectors expressed concern on the possible adverse noise impact on Avon Park caused by the proposed noise barriers. We explained to them that the scope of the project was to mitigate road traffic noise generated from the section of Fanling Highway near Fanling Centre only. There would not be any significant adverse noise impact on Avon Park. We also advised the objectors that the traffic noise impact of the Fanling Highway on Avon Park had already been addressed through noise mitigation measures proposed and implemented by the developer, such as the setting back of residential blocks from Fanling Highway and the provision of window insulation and air-conditioning to the affected units facing Fanling Highway. However, the objectors maintained their objections. Having considered the unresolved objections, the Chief Executive-in-Council authorised the road scheme of **723TH** under the Ordinance on 4 May 2004. The notice of authorisation was gazetted on 14 May 2004.

ENVIRONMENTAL IMPLICATIONS

17. **722TH** and **723TH** are not designated projects under the Environmental Impact Assessment Ordinance. We completed the environmental assessment for the projects in March 2004 and concluded that they would not cause adverse long-term environmental impact. The projects would reduce the existing traffic noise levels on the affected noise sensitive receivers near Choi Yuen Estate at Sheung Shui and Fanling Centre at Fanling by up to 17 dB(A) and 10 dB(A) respectively.

18. For short-term construction impacts, we will control the noise, dust and site run-off nuisances to within the established standards and guidelines through the implementation of mitigation measures. We will also carry out the EM&A programme to ensure proper implementation of the recommendations of the environmental assessment.

19. At the planning and design stages, we have considered ways to minimise the generation of construction and demolition (C&D) materials. We estimate that the volume of C&D materials to be generated by each proposed project to be as follows -

/Project

Project no.	Total C&D materials generated	C&D materials reused/recycled at site		C&D materials to public filling areas ⁵		C&D materials to landfills	
		m ³	%	m ³	%	m ³	%
722TH	26 000	10 700	41.2	10 600	40.8	4 700	18.0
723TH	16 000	6 900	43.1	5 800	36.3	3 300	20.6

The notional⁶ costs of accommodating C&D waste at landfill sites are estimated to be \$587,500 for **722TH** and \$412,500 for **723TH** for the projects (based on a notional unit cost of \$125/m³).

20. We will require the contractor to submit a Waste Management Plan (WMP) for approval. The WMP will include appropriate mitigation measures to minimise, reuse and recycle the C&D materials. We will require the contractor to carry out on site sorting of C&D materials and ensure that the day-to-day operations on site comply with the approved WMP. We will also control the disposal of public fill and C&D waste at designated public filling facilities and landfills respectively through a trip-ticket system. We will record and monitor the re-use and disposal of C&D materials. To further minimise the generation of C&D materials, we will encourage the contractor to use non-timber formwork and recyclable materials for temporary works.

LAND ACQUISITION

21. The proposed works do not require land resumption.

BACKGROUND INFORMATION

22. We upgraded **722TH** and **723TH** to Category B in September 1998.

/In

⁵ A public filling area is a designated part of a development project that accepts public fill for reclamation purpose. Disposal of public fill in a public filling area requires a licence issued by the Director of Civil Engineering.

⁶ This estimate has taken into account the cost for developing, operating and restoring the landfills after they are filled and the aftercare required. It does not include the land opportunity cost for existing landfill sites (which is estimated at \$90/m³), nor the cost to provide new landfills (which are likely to be more expensive) when the existing ones are filled. The notional cost estimate is for reference only and does not form part of this project estimate.

In March 1999, we engaged consultants to carry out the review and detailed design for the proposed works at an estimated cost of \$4.0 million under **Subhead 6100TX** “Highway works, studies and investigations for items in Category D of the Public Works Programme”. The consultants substantially completed the review and the detailed design in December 2003.

23. We will reuse the noise barrier materials recovered from **561TH** “Widening of Tolo Highway between Island House Interchange and Ma Liu Shui Interchange” in **722TH** and **723TH**. As the road sections in **722TH** and **723TH** are part of the Tolo Highway northern section, noise barriers of the same type, make and colour at these locations could therefore be regarded as natural extensions of the noise barriers along Tolo Highway.

24. The proposed noise barrier panels for cantilever type noise barriers are generally of transparent type and non-transparent type at the upper and lower parts respectively. For vertical type noise barriers, the proposed noise barrier panels are of non-transparent type. Drawings showing the perspective view of the noise barriers under **722TH** and **723TH** are at Enclosures 4 and 5 respectively. We consulted the Advisory Committee on the Appearance of Bridges and Associated Structures⁷ on the aesthetic design of the noise barriers on 21 October 2003. The Committee supported the aesthetic design of the noise barriers.

25. The proposed retrofitting of noise barriers will involve removal of 233 trees including 116 trees to be felled and 117 trees to be replanted within the project sites. All the trees to be removed are not important trees⁸. We will incorporate planting proposals as part of the projects, including estimated quantities of 270 trees, 23 000 shrubs and 19 000 square metres of grassed area. The planting proposals would more than compensate for the trees to be felled.

/26.

⁷ The Advisory Committee on the Appearance of Bridges and Associated Structures, which comprises representatives of the Hong Kong Institute of Architects, the Hong Kong Institution of Engineers, Architectural Services Department, Highways Department, Housing Department, Planning Department and Territory Development Department, is responsible for vetting the design of bridges and other structures associated with the public highway system, including noise barriers, from the aesthetic and visual impact points of view.

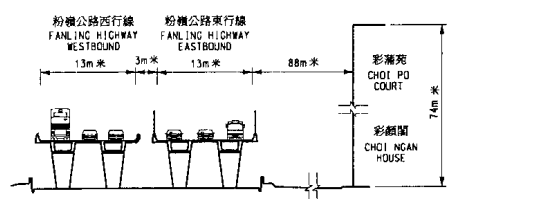
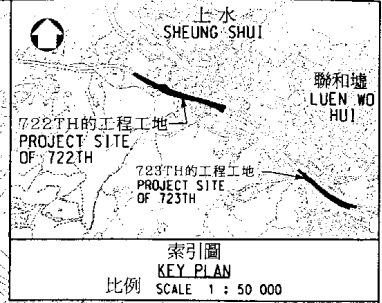
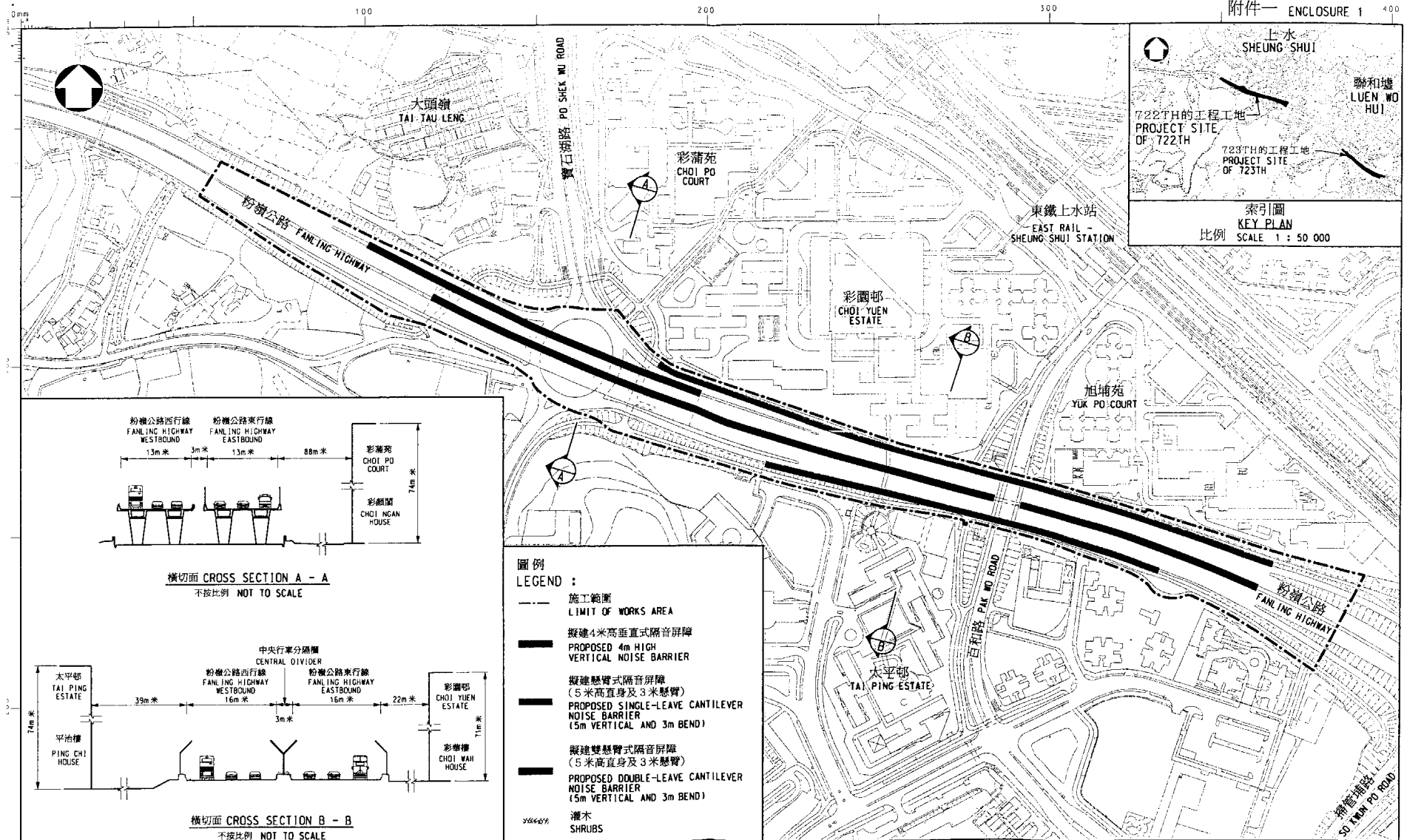
⁸ Important trees include trees on the Register of Old and Valueable Trees and any other trees which meet one or more of the following criteria –

- trees over 100 years old;
- trees of cultural, historical or memorable significance;
- trees of precious or rare species;
- trees of outstanding form; or
- trees with trunk diameter exceeding one metre (measured at one metre above ground level).

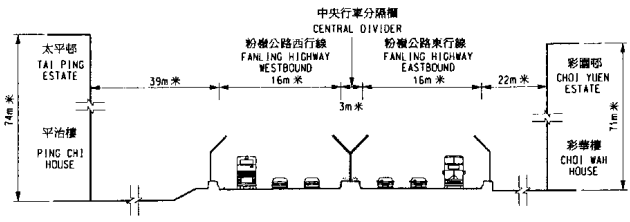
26. We estimate that the proposed works will create the following job opportunities -

Project no.	Estimated no. of jobs			Estimated total man-months
	Total	Labourer	Professional/ Technical staff	
722TH	165	130	35	2 400
723TH	105	80	25	1 500

Environment, Transport and Works Bureau
May 2004



橫切面 CROSS SECTION A - A
不按比例 NOT TO SCALE



橫切面 CROSS SECTION B - B
不按比例 NOT TO SCALE

- 圖例
LEGEND :
- 施工範圍
LIMIT OF WORKS AREA
 - █ 擬建4米高垂直式隔音屏障
PROPOSED 4m HIGH VERTICAL NOISE BARRIER
 - █ 擬建懸臂式隔音屏障
(5米高直身及3米懸臂)
PROPOSED SINGLE-LEAVE CANTILEVER NOISE BARRIER (5m VERTICAL AND 3m BEND)
 - █ 擬建雙懸臂式隔音屏障
(5米高直身及3米懸臂)
PROPOSED DOUBLE-LEAVE CANTILEVER NOISE BARRIER (5m VERTICAL AND 3m BEND)
 - 灌木
SHRUBS

圖則名稱 plan title
工務計劃項目第722TH號
粉嶺公路近上水彩園邨的加建隔音屏障工程 - 平面圖
PWP ITEM NO. 722TH
RETROFITTING OF NOISE BARRIERS ON FANLING HIGHWAY NEAR CHOI YUEN ESTATE, SHEUNG SHUI
- LAYOUT PLAN

設計 designed	SIGNED	繪圖 drawn	SIGNED
W.L.CHU	28/04/04	S.K.TSE	28/04/04
覆核 checked	SIGNED	批准 approved	SIGNED
W.L.CHU	28/04/04	S.W.WONG	28/04/04
主要工程管理處 MAJOR WORKS PROJECT MANAGEMENT OFFICE			

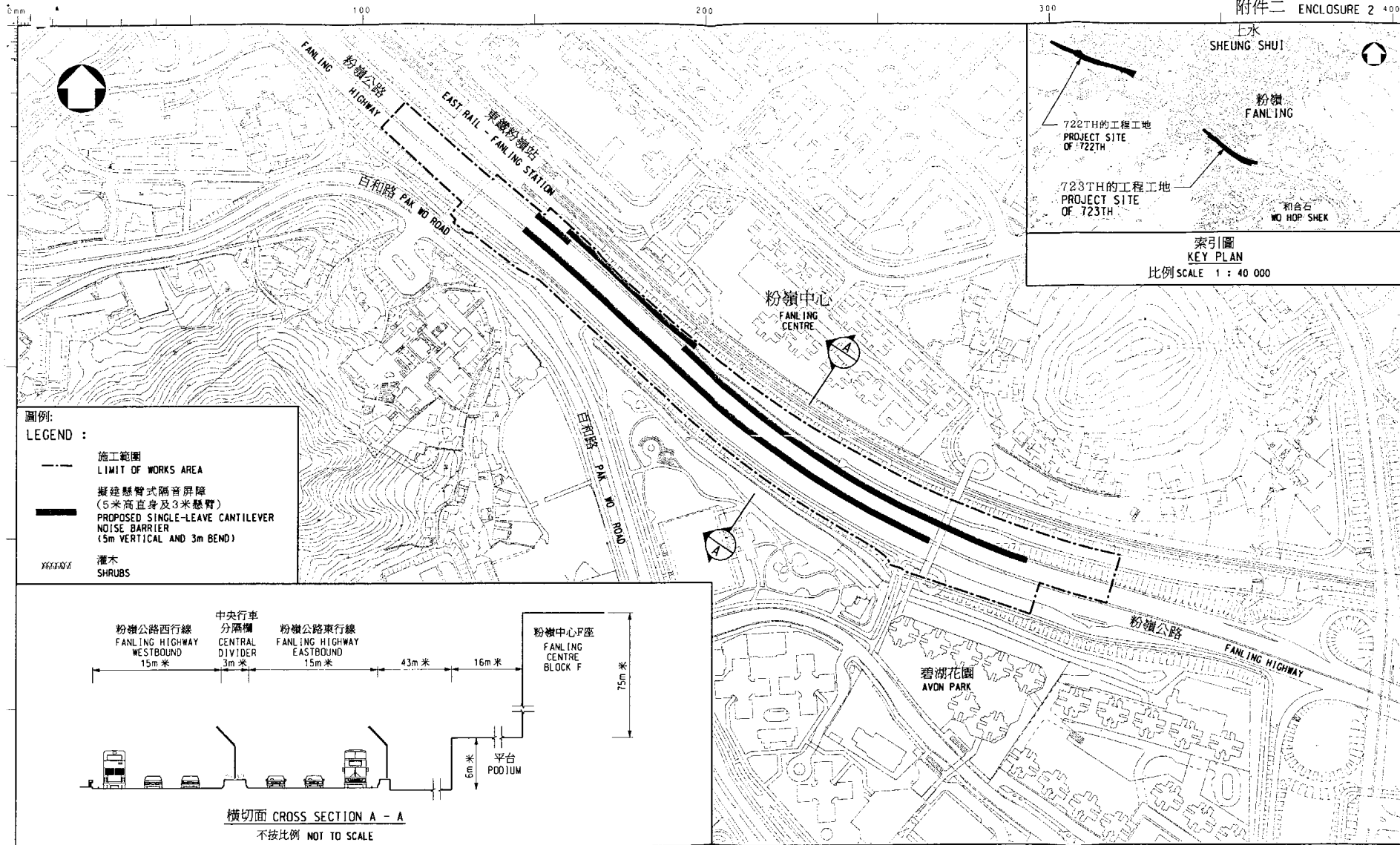
圖則編號 plan no.
HMW6722TH-SP0008

比例 scale
1:3000
或如圖示
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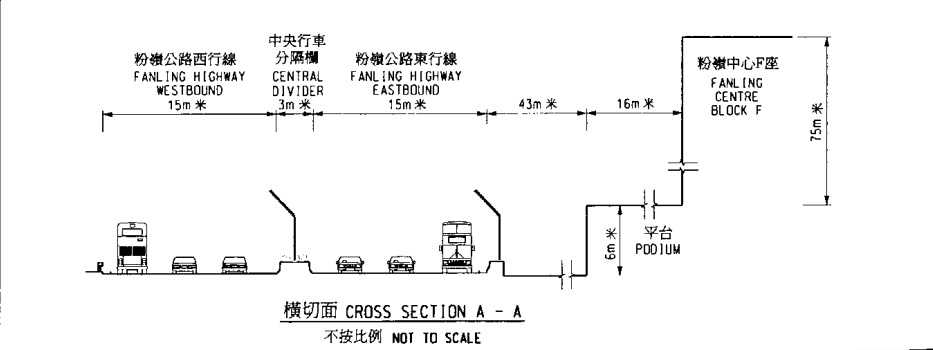
HIGHWAYS DEPARTMENT
HONG KONG

路香港
政政署
HONG KONG



圖例:
LEGEND :

- 施工範圍
LIMIT OF WORKS AREA
- 擬建懸臂式隔音屏障
(5米高直身及3米懸臂)
PROPOSED SINGLE-LEAVE CANTILEVER NOISE BARRIER
(5m VERTICAL AND 3m BEND)
- XXXXXX 灌木
SHRUBS



圖則名稱 drawing title
 工務計劃項目第723TH號
 粉嶺公路近粉嶺中心的加建隔音屏障工程 - 平面圖
 PWP ITEM NO. 723TH
 RETROFITTING OF NOISE BARRIERS ON FANLING HIGHWAY NEAR FANLING CENTRE, FANLING
 - LAYOUT PLAN

設計 designed W.L.CHU 28/04/04	SIGNED	繪圖 drawn S.K.TSE 28/04/04	SIGNED
覆核 checked W.L.CHU 28/04/04	SIGNED	批准 approved S.W.WONG 28/04/04	SIGNED
主要工程管理處 MAJOR WORKS PROJECT MANAGEMENT OFFICE			

圖則編號 drawing no.
 HMW6723TH-SP0008

比例 scale
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HONG KONG HIGHWAYS DEPARTMENT
 路政署
 HONG KONG

Enclosure 3 to PWSC(2004-05)14

**722TH – Retrofitting of noise barriers on
Fanling Highway near Choi Yuen Estate, Sheung Shui
723TH – Retrofitting of noise barriers on
Fanling Highway near Fanling Centre, Fanling**

Breakdown of estimates for consultants' fees (in September 2003 prices)

Consultants' staff costs		Estimated man-months		Average MPS ^a salary point	Multiplier (Note 1)	Estimated fee (\$ million)	
		722TH	723TH			722TH	723TH
(a) Construction supervision and contract administration (Note 2)	Professional	–	–	–	–	0.2	0.2
	Technical	–	–	–	–	0.6	0.4
(b) Resident site Staff	Professional	21	15	38	1.6	1.9	1.3
	Technical	190	130	14	1.6	5.7	3.9
(c) EM&A programme	Professional	2	1	38	2.0	0.2	0.1
	Technical	4	3	14	2.0	0.1	0.1
					Total	8.7	6.0

*MPS = Master Pay Scale

Notes

1. A multiplier of 2.0 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 consultants' offices. A multiplier of 1.6 is applied to the average MPS point in the case of resident site staff supplied by the consultants. (At 1 January 2004, MPS pt. 38 = \$55,993 per month and MPS pt. 14 = \$18,603 per month).
2. The consultants' fees for construction supervision and contract administration are estimated in accordance with Agreement No. CE 55/98 titled "Design and Construction of Noise Enclosures and Barriers on Fanling Highway near Choi Yuen Estate and Fanling Centre". The construction phase of the assignment will only be executed subject to Finance Committee's approval to upgrade 722TH and 723TH to Category A.



圖則名稱 drawing title
 工程計劃項目第722TH號 - 粉嶺公路近上水影園邨的加建隔音屏障工程
 - 透視觀於擬建懸臂式隔音屏障 (6米高豎身及3米懸臂)
 PWP ITEM NO. 722TH - RETROFITTING OF NOISE BARRIERS ON FANLING HIGHWAY
 NEAR CHOI YUEN ESTATE, SHEUNG SHUI
 - PERSPECTIVE VIEW TO PROPOSED SINGLE-LEAVE CANTILEVER NOISE BARRIER
 (15m VERTICAL AND 3m BEND)

設計 designed SIGNED W.L.DHU 27/04/04	繪圖 draw SIGNED S.K.TSE 27/04/04
覆核 checked SIGNED W.L.DHU 27/04/04	批准 approved SIGNED S.W.WONG 27/04/04

圖則編號 drawing no. HMW6722TH-SP0007	比例 scale 1:50 NOT TO SCALE
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主要工程管理處
 MAJOR WORKS
 PROJECT MANAGEMENT OFFICE



香港
 路政處
 HIGHWAYS
 DEPARTMENT
 HONG KONG



圖則名稱 drawing title

工務計劃項目第723TH號 - 粉嶺公路近粉嶺中心的加建隔音屏障工程
- 透視觀景於擬建懸臂式隔音屏障 (5米高直身及3米懸臂)

PWP ITEM NO. 723TH - RETROFITTING OF NOISE BARRIERS ON FANLING HIGHWAY
NEAR FANLING CENTRE, FANLING
- PERSPECTIVE VIEW TO PROPOSED SINGLE-LEAVE CANTILEVER NOISE BARRIER
(5m VERTICAL AND 3m BEND)

設計 designed
W.L. DU 27/04/04

繪圖 drawn
S.-K. TSE 27/04/04

圖則編號 drawing no.
HMW6723TH-SP0007

比例 scale
不按比例
NOT TO SCALE

覆核 checked
W.L. DU 27/04/04

批准 approved
S.-K. WONG 27/04/04

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主要工程管理處
MAJOR WORKS
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HIGHWAYS
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附件五

ENCLOSURE 5