

## ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

### HEAD 706 – HIGHWAYS

#### Transport – Roads

#### 818TH – Retrofitting of noise barriers on Tai Po Tai Wo Road

Members are invited to recommend to Finance Committee –

- (a) the upgrading of part of **818TH**, entitled “Retrofitting of noise barriers on Tai Po Tai Wo Road near Po Nga Court”, to Category A at an estimated cost of \$96.6 million in money-of-the-day prices; and
- (b) the retention of the remainder of **818TH** in Category B.

### PROBLEM

Dwellings of Po Nga Court adjacent to Tai Po Tai Wo Road are exposed to excessive traffic noise.

### PROPOSAL

2. The Director of Highways, with the support of the Secretary for the Environment, proposes to upgrade part of **818TH** to Category A at an estimated cost of \$96.6 million in money-of-the-day (MOD) prices for the retrofitting of noise barriers on Tai Po Tai Wo Road near Po Nga Court.

/PROJECT.....

**PROJECT SCOPE AND NATURE**

3. The part of the project **818TH** we now propose to upgrade to Category A comprises –

- (a) retrofitting of single-leaf cantilevered noise barriers of about 160 metres (m) in length and 8 m in height along the verge of the westbound carriageway of Tai Po Tai Wo Road near Ka Wo House and Hing Wo House of Po Nga Court (i.e. works described under paragraph 4(c) below);
- (b) associated road, drainage, street lighting, geotechnical and landscaping works (i.e. part of works described under paragraph 4(d) below); and
- (c) implementation of an environmental monitoring and audit (EM&A) programme for the works in (a) to (b) above (i.e. part of works described under paragraph 4(e) below).

———— A layout plan with cross sections of the proposed works is at Enclosure 1.

4. The scope of **818TH** comprises –

- (a) retrofitting of noise semi-enclosures of about 140 m in length and 10 m in height straddling the verge and central divider of the eastbound carriageway of Tai Po Tai Wo Road near Blocks numbered 3 to 8 of Serenity Park I;
- (b) retrofitting of vertical noise barriers of about 70 m in length and 6 m in height along the verge of the westbound carriageway of Tai Po Tai Wo Road near Hang Wo House of Tai Wo Estate;
- (c) retrofitting of single-leaf cantilevered noise barriers of about 160 m in length and 8 m in height along the verge of the westbound carriageway of Tai Po Tai Wo Road near Ka Wo House and Hing Wo House of Po Nga Court;
- (d) associated road, drainage, street lighting, geotechnical and landscaping works; and

/(e) .....

- (e) implementation of an EM&A programme for the works in (a) to (d) above.

— A layout plan showing the proposed sections of retrofitting works of **818TH** is at Enclosure 2. We would continue to liaise with local residents in relation to implementing the remaining works under **818TH** in due course (please see paragraphs 14 to 15 below for details).

5. Subject to Finance Committee's funding approval, we plan to commence the construction works in October 2011 for completion in December 2013.

### JUSTIFICATION

6. To mitigate the noise impact of existing roads on neighbouring residents, it is the Government's policy to consider the implementation of direct engineering solutions, where practicable, by way of retrofitting of noise barriers and enclosures, and resurfacing with low noise material on existing roads with a traffic noise level exceeding the limit of 70 dB(A)<sup>1</sup>.

7. For Po Nga Court, Serenity Park and Hang Wo House of the Tai Wo Estate fronting Tai Wo Road, there are a total of about 1 200 dwellings exposed to traffic noise level exceeding 70 dB(A). **818TH** comprises retrofitting of noise barriers and semi-enclosure on these three road sections. The whole project will benefit about 660 dwellings with reduction in traffic noise levels of about 1 to 20 dB(A). After consulting residents of concerned residential developments and the Tai Po District Council (TPDC), we propose to proceed with the retrofitting of noise barriers on Tai Po Tai Wo Road fronting Po Nga Court first so that the dwellings of Po Nga Court could benefit from the noise mitigation measures as soon as possible. Details of consultation are provided in paragraphs 14 to 15 below. We will continue to discuss with the affected residents on the proposed noise barriers near Hang Wo House of the Tai Wo Estate and Serenity Park, and consider other suitable and technically feasible direct engineering solutions for reducing noise traffic levels faced by residents.

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<sup>1</sup> Road traffic noise level is specified in terms of  $L_{10}(1 \text{ hour})$  which is the noise level exceeded for 10% of a one-hour period and is generally used for measuring 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.

8. About 380 dwellings in Po Nga Court fronting Tai Po Tai Wo Road are exposed to excessive traffic noise levels between 71 and 77 dB(A). On the basis of detailed study by the Highways Department (HyD), the proposed retrofitting of noise barriers at Tai Po Tai Wo Road near Ka Wo House and Hing Wo House of Po Nga Court will benefit about 150 dwellings with reduction in traffic noise levels of 1 to 18 dB(A). The remaining some 230 dwellings are situated more closely to the road junction of Tai Po Tai Wo Road and Po Nga Road. Due to the constraints imposed by the road junction, we do not recommend further extending the noise barriers as a noise mitigation measure for the dwellings. Instead, HyD had already applied low-noise road surfaces at suitable locations of Tai Po Tai Wo Road fronting Po Nga Court, which had helped reduced the noise level by about 2 dB(A).

9. The aesthetic design of the proposed noise barriers will be in harmony with the surrounding environment. The proposed cantilevered noise barriers will sit on a reinforced concrete base wall. We will install transparent and translucent panels for the noise barriers and cover the roadside exterior surface of the reinforced concrete base wall by climbers to improve aesthetics as well as to promote green surroundings. The perspective view of the proposed noise barriers is at Enclosure 3. The TPDC and Advisory Committee on the Appearance of Bridges and Associated Structures<sup>2</sup> (ACABAS) have respectively supported and accepted the aesthetic design.

## FINANCIAL IMPLICATIONS

10. We estimate the costs of the proposed works to be \$96.6 million in MOD prices (please see paragraph 11 below), broken down as follows –

	<b>\$ million</b>
(a) Noise barriers	58.2
(i) superstructure	24.7
(ii) foundation	33.5
(b) Associated road, drainage, street lighting and geotechnical works	8.3

/ \$ million .....

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<sup>2</sup> 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, the Hong Kong Institute of Planners, an academic institution, Architectural Services Department, Highways Department, Housing Department and Civil Engineering and Development Department, is responsible for vetting the design of bridges and other structures associated with the highway system, including noise barriers and enclosures, from the aesthetic and visual impact points of view.

		<b>\$ million</b>	
(c)	Landscaping works	1.9	
(d)	Consultants' fees	0.5	
	(i) contract administration	0.2	
	(ii) management of resident site staff	0.3	
(e)	Remuneration of resident site staff	9.0	
(f)	Contingencies	7.9	
	Sub-total	85.8	(in September 2010 prices)
(g)	Provision for price adjustment	10.8	
	Total	96.6	(in MOD prices)

— A breakdown of the estimated consultants' fees is at Enclosure 4.

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

Year	\$ million (Sept 2010)	Price adjustment factor	\$ million (MOD)
2011 – 2012	16.4	1.04525	17.1
2012 – 2013	33.1	1.10143	36.5
2013 – 2014	26.5	1.16201	30.8
2014 – 2015	6.7	1.22592	8.2
2015 – 2016	3.1	1.29335	4.0
	85.8		96.6

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12. We have derived the MOD estimates on the basis of the Government's latest set of assumptions on the trend rate of change in the prices of public sector building and construction output for the period 2011 to 2016. The contract will provide for price adjustments.

13. We estimate the annual recurrent expenditure arising from the proposed works to be \$0.1 million.

## **PUBLIC CONSULTATION**

14. Since May 2007, we consulted the Environment, Housing and Works Committee (EHWC) of the TPDC and residents of concerned residential developments on several occasions on the project including noise barriers on Tai Po Tai Wo Road fronting Po Nga Court and Tai Wo Estate, and semi-enclosure at Serenity Park. With the support of the EHWC on 10 September 2008, the project was first gazetted under the Road (Works, Use and Compensation) Ordinance (Cap. 370) (the Ordinance) in October 2008. We received objections concerning the semi-enclosure fronting Serenity Park I which would be too close to the development. After consulting EHWC, an amended road scheme, which only covered the proposed noise barriers at Po Nga Court and Tai Wo Estate, was gazetted in September 2009. Further objections, mainly concerning about the environmental and traffic impact arising from the construction of the proposed noise barriers at Po Nga Court and Tai Wo Estate, were received on the amended scheme. Having considered the unresolved objections, the Chief Executive in Council authorised the works for the Po Nga Court and Tai Wo Estate sections under the Ordinance and the notice of authorisation was gazetted in June 2010.

15. After the gazettal of the notice of authorisation, the Mutual Aid Committee of Hang Wo House of the Tai Wo Estate wrote to express objections to the noise barrier fronting Hang Wo House. A briefing session was held in November 2010 to brief the residents of Po Nga Court and Tai Wo Estate on the progress of the project. The majority of participants from Hang Wo House of Tai Wo Estate at the briefing did not consider that there was a need to construct the noise barriers at Tai Wo Estate, and the majority of participants at the briefing urged the Administration to handle the two sections of noise barriers separately. We therefore further proposed to proceed with works at the Po Nga Court section first so that residents at Po Nga Court would be able to benefit from the noise mitigation measures as soon as possible. We consulted the EHWC of TPDC in January 2011 accordingly and the EHWC supported our proposal.

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16. We consulted the Legislative Council Panel on Environmental Affairs on 28 February 2011 on the proposed works. Members supported the funding application for the proposed noise barrier scheme.

## **ENVIRONMENTAL IMPLICATIONS**

17. The project is not a designated project under the Environmental Impact Assessment Ordinance (Cap. 499). Nevertheless, we have conducted an environmental study which concluded that the proposed works would not cause adverse long-term environmental impact.

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

19. At the planning and design stages, we have considered the design and construction sequence of the proposed works to reduce the generation of construction waste where possible. In addition, we will require the contractor to reuse inert construction waste (e.g. excavated soil) on site or in other suitable construction sites as far as possible, in order to minimize the disposal of inert construction waste at public fill reception facilities<sup>3</sup>. We will encourage the contractor to maximize the use of recycled/recyclable inert construction waste, and the use of non-timber formwork to further reduce the generation of construction waste.

20. At the construction stage, we will require the contractor to submit for approval a plan setting out the waste management measures, which will include appropriate mitigation means to avoid, reduce, reuse and recycle inert construction waste. We will ensure that the day-to-day operations on site comply with the approved plan. We will require the contractor to separate the inert portion from non-inert construction waste on site for disposal at appropriate facilities. We will control the disposal of inert construction waste and non-inert construction waste at public fill reception facilities and landfills respectively through a trip-ticket system.

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<sup>3</sup> Public fill reception facilities are specified in Schedule 4 of the Waste Disposal (Charges for Disposal of Construction Waste) Regulation. Disposal of inert construction waste in public fill reception facilities requires a licence issued by the Director of Civil Engineering and Development.

21. We estimate that the project will generate in total about 8 495 tonnes of construction waste. Of these, we will reuse about 4 500 tonnes (53%) of inert construction waste on site and deliver 3 860 tonnes (45.4%) of inert construction waste to public fill reception facilities for subsequent reuse. We will dispose of the remaining 135 tonnes (1.6%) of non-inert construction waste at landfills. The total cost for accommodating the construction waste at public fill reception facilities and landfill sites is estimated to be about \$0.1 million for the proposed works (based on a unit cost of \$27 per tonne for disposal at public fill reception facilities and \$125 per tonne<sup>4</sup> at landfills).

## **HERITAGE IMPLICATIONS**

22. The proposed works will not affect any heritage site, i.e. all declared monuments, proposed monuments, graded historic sites/buildings, sites of archaeological interest and Government historic sites identified by the Antiquities and Monuments Office.

## **LAND ACQUISITION**

23. The proposed works do not require land resumption.

## **INTERIM TRAFFIC DIVERSION PROPOSALS**

24. The westbound carriageway of Tai Po Tai Wo Road will be temporarily reduced from two lanes to one lane when necessary during the construction period. We will require the contractor to maintain at all times at least one traffic lane of the westbound carriageway during the entire construction period. We have undertaken a traffic impact assessment to assess the impact of the temporary traffic arrangement during construction, which concluded that this temporary traffic arrangement will not cause significant adverse impact to road users.

**/BACKGROUND .....**

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<sup>4</sup> The 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 per m<sup>3</sup>), nor the cost to provide new landfills (which are likely to be more expensive) when the existing ones are filled.



## BACKGROUND INFORMATION

25. We upgraded **818TH** to Category B in November 2006. In April 2008, we engaged consultants to carry out the investigation and detailed design for the works proposed to be upgraded at an estimated cost of about \$0.5 million under **Subhead 6100TX** “Highway works, studies and investigations for items in Category D of the Public Works Programme”. In August 2010, we carried out site investigation works for the works proposed to be upgraded at a cost of about \$0.4 million under **Subhead 6100TX**. We have substantially completed the detailed design for the proposed works.

26. Of the 124 trees within the project boundary, 16 trees will be preserved. The proposed works will involve removal of 108 trees, including 75 trees to be felled and 33 trees to be transplanted elsewhere. All trees to be removed are not important trees<sup>5</sup>. We will incorporate planting proposals as part of the project, including an estimate of 92 trees and 2 700 shrubs and 500 square metres of grassed area.

27. We estimate that the proposed works will create about 75 jobs (61 for labourers and another 14 for professional/technical staff) providing a total employment of 1 753 man-months.

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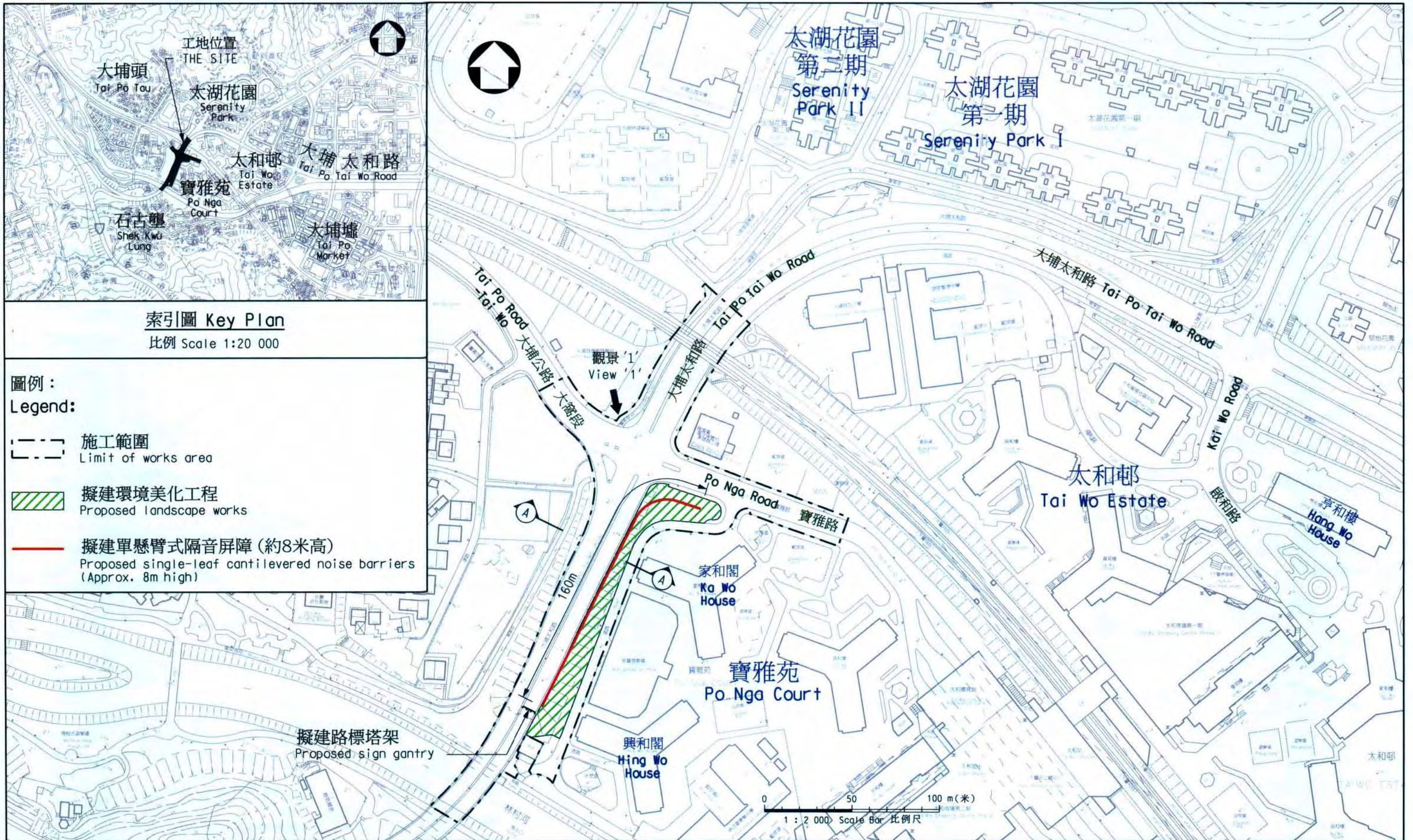
Environment Bureau  
April 2011

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<sup>5</sup> An “important tree” refers to trees on the Register of Old and Valuable Trees, or any other trees that meet one or more of the following criteria -

- (a) trees of over 100 years old or above;
- (b) trees of cultural, historical or memorable significance e.g. Fung Shui trees, trees as landmark of monastery or heritage monument, and trees in memory of an important person or event;
- (c) trees of precious or rare species;
- (d) trees of outstanding form (taking account of overall tree sizes, shape and any special features) e.g. trees with curtain like aerial roots, trees growing in unusual habitat; or
- (e) trees with trunk diameter equal or exceeding 1.0 metre (measured at 1.3 metre above ground level), or with height/canopy spread equal or exceeding 25 metres.





索引圖 Key Plan

比例 Scale 1:20 000

圖例：  
Legend:

-  施工範圍  
Limit of works area
-  擬建環境美化工程  
Proposed landscape works
-  擬建單懸臂式隔音屏障 (約8米高)  
Proposed single-leaf cantilevered noise barriers (Approx. 8m high)

擬建路標塔架  
Proposed sign gantry

大埔太和路近寶雅苑加建隔音屏障工程

Retrofitting of noise barriers on Tai Po Tai Wo Road near Po Nga Court

- 平面圖 Layout Plan

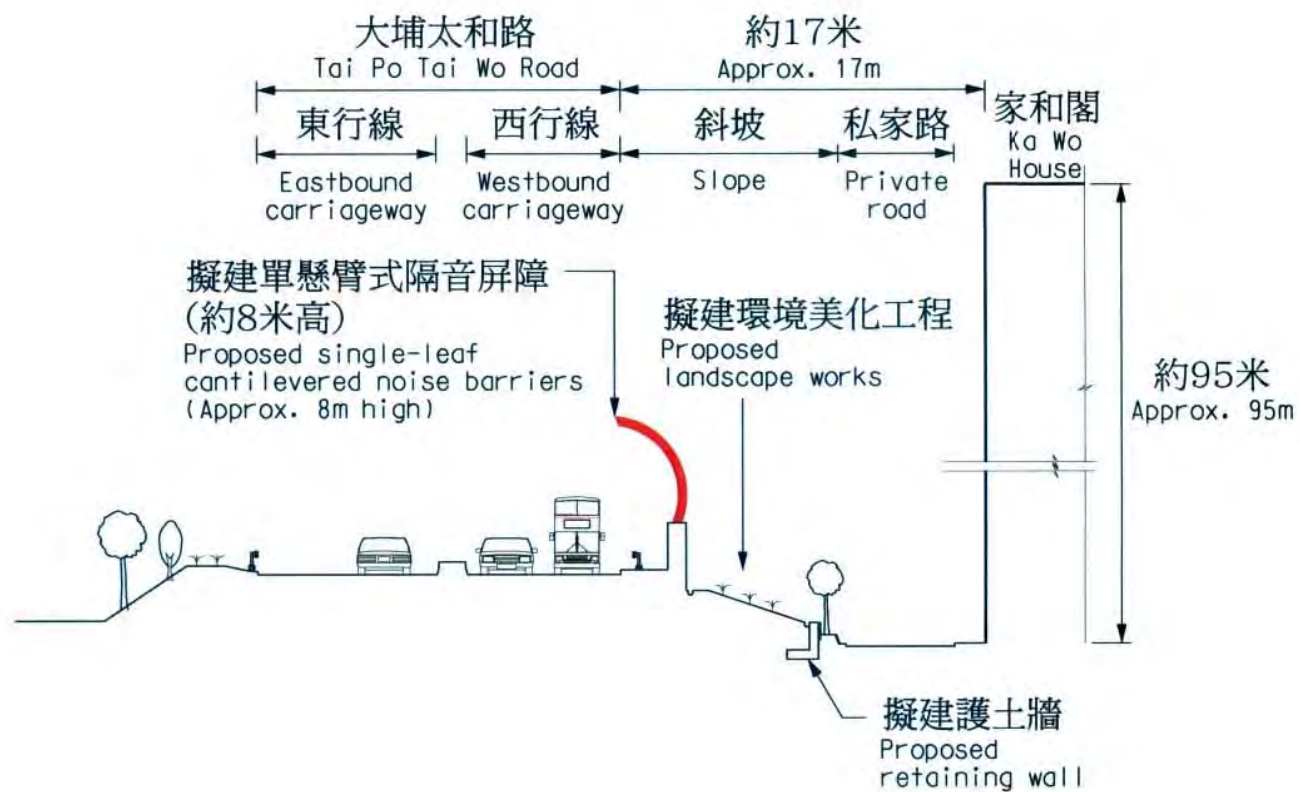
圖則編號 plan no.  
HMW6818TH-SK0018

比例 scale  
如圖示  
AS SHOWN

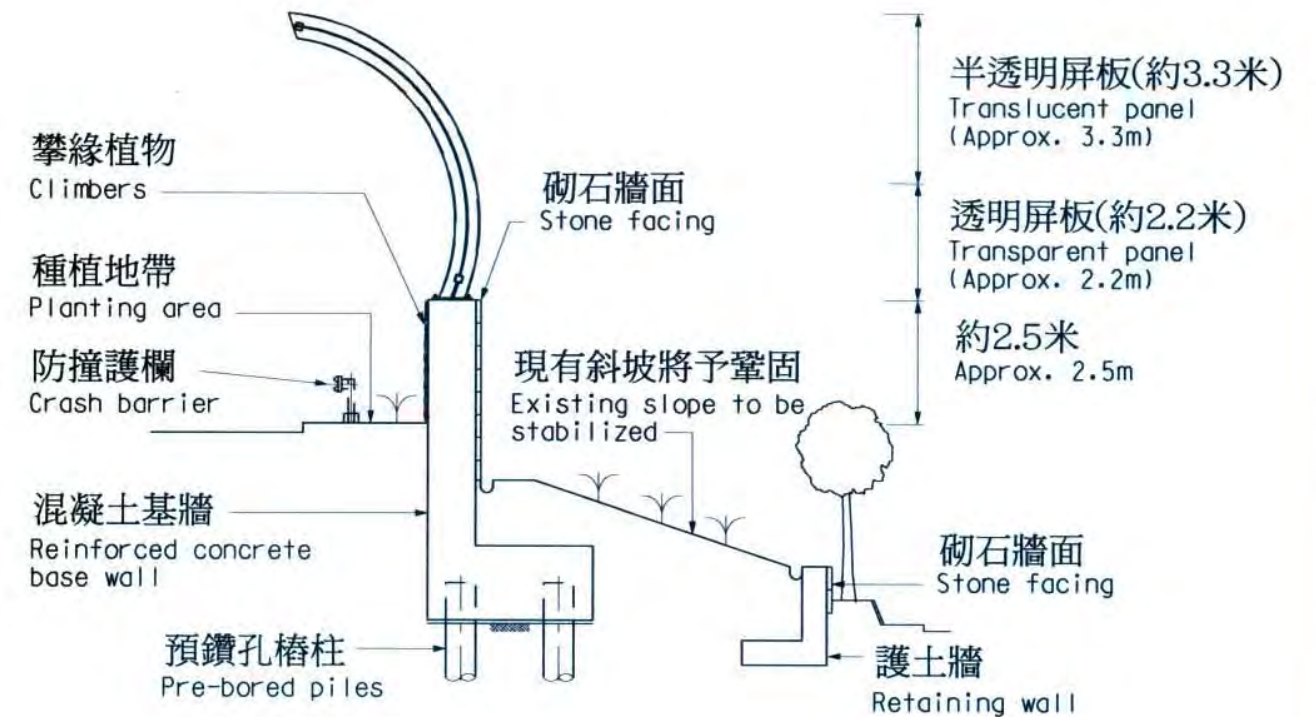
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路政署 香港





切面 Section A - A



擬建隔音屏障的典型切面圖  
Typical Section of Proposed Noise Barriers

大埔太和路近寶雅苑加建隔音屏障工程

Retrofitting of noise barriers on Tai Po Tai Wo Road near Po Nga Court

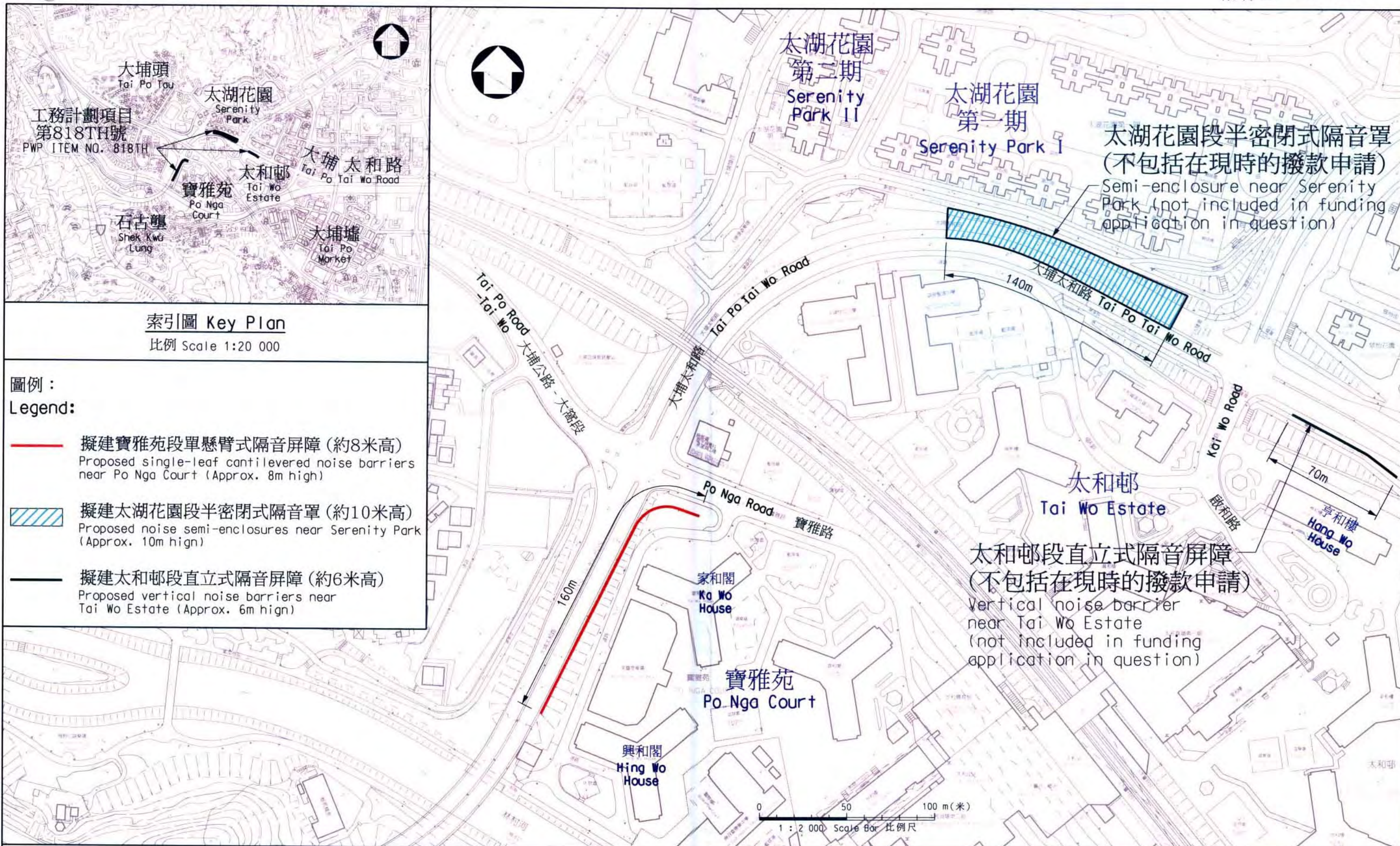
- 切面圖 Sections

圖則編號 drawing no. HMW6818TH-SK0020 比例 scale 示意圖 DIAGRAMMATIC

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索引圖 Key Plan

比例 Scale 1:20 000

圖例：  
Legend:

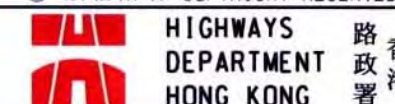
- 擬建寶雅苑段單懸臂式隔音屏障 (約8米高)  
Proposed single-leaf cantilevered noise barriers near Po Nga Court (Approx. 8m high)
- 擬建太湖花園段半密閉式隔音罩 (約10米高)  
Proposed noise semi-enclosures near Serenity Park (Approx. 10m high)
- 擬建太和邨段直立式隔音屏障 (約6米高)  
Proposed vertical noise barriers near Tai Wo Estate (Approx. 6m high)

工務計劃項目第818TH號 - 大埔太和路加建隔音屏障工程  
PWP Item No. 818TH - Retrofitting of noise barriers on Tai Po Tai Wo Road  
- 平面圖 Layout Plan

圖則編號 plan no.  
HMW6818TH-SK0021

比例 scale  
如圖示  
AS SHOWN

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HIGHWAYS  
DEPARTMENT  
HONG KONG

路 香  
政 港  
署





觀景 '1' View '1'



觀景 '1' View '1'

大埔太和路近寶雅苑加建隔音屏障工程

Retrofitting of noise barriers on Tai Po Tai Wo Road near Po Nga Court

- 擬建隔音屏障的模擬效果圖 Artist Impression of the Proposed Noise Barriers

圖則編號 drawing no. HMW6818TH-SK0019 比例 scale 示意圖 DIAGRAMMATIC

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## Enclosure 4 to PWSC(2011-12)4

### Retrofitting of noise barriers on Tai Po Tai Wo Road near Po Nga Court

#### Breakdown of estimates for consultants' fees and resident site staff costs (in September 2010 prices)

		Estimated man-months	Average MPS* salary point	Multiplier (Note 1)	Estimated fees (\$ million)
(a) Consultants' fees for construction supervision and contract administration (Note 2)	Professional	–	–	–	0.1
	Technical	–	–	–	0.1
				Sub-total	0.2
(b) Resident site staff costs (Note 3)	Professional	31	38	1.6	2.9
	Technical	201	14	1.6	6.4
				Sub-total	9.3
Comprising:-					
(i) Consultants' fees for management of resident site staff					0.3
(ii) Remuneration of resident site staff					9.0
				Total	9.5

\* MPS = Master Pay Scale

#### Notes

1. A multiplier of 1.6 is applied to the average MPS salary point to estimate the cost of resident site staff supplied by the consultants. (As at now, MPS salary pt. 38 = \$58,195 per month and MPS pt. 14 = \$19,945 per month.)
2. The consultants' fees for contract administration are estimated in accordance with Agreement No. CE 48/2007 (HY) titled "Retrofitting of Noise Barriers on Tai Po Tai Wo Road – Investigation, Design and Construction". The construction phase of the assignment will only be executed subject to Finance Committee's approval to upgrade part of **818TH** to Category A.
3. The actual man-months and actual costs will only be known after completion of the construction works.