

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

### **HEAD 707 – NEW TOWNS AND URBAN AREA DEVELOPMENT**

#### **Transport – Roads**

#### **861TH – Widening of Tai Po Road (Sha Tin Section) - construction**

### **HEAD 706– HIGHWAYS**

#### **Transport – Roads**

#### **804TH – Retrofitting of Noise Barriers on Tai Po Road (Sha Tin Section)**

Members are invited to recommend to the Finance Committee the upgrading of **861TH and 804TH** to Category A at estimated cost of \$2,739.7 million and \$851.8 million in money-of-the-day prices respectively.

### **PROBLEM**

We need to widen a section of Tai Po Road (Sha Tin Section) of about 1.1 kilometres between Sha Tin Plaza near Sha Tin Rural Committee Road and Man Wo House of Wo Che Estate near Fo Tan Road from dual two-lane to dual three-lane carriageway to meet the traffic demand. On the other hand, the existing dwellings in the vicinity of the section of Tai Po Road (Sha Tin Section) between Scenery Court and Citylink Plaza and that between Wo Che Estate and Fo Tan Road are affected by excessive traffic noise and it is necessary to retrofit noise barriers on these road sections as well.

### **PROPOSAL**

2. The Director of Civil Engineering and Development proposes, with the support of the Secretary for Transport and Housing, to upgrade **861TH** to Category A at an estimated cost of \$2,739.7 million in money-of-the-day (MOD) prices for widening of Tai Po Road (Sha Tin Section).

3. The Director of Highways proposes, with the support of the Secretary for the Environment, to upgrade **804TH** to Category A at an estimated cost of \$851.8 million in MOD prices for retrofitting noise barriers on sections of Tai Po Road (Sha Tin Section).

————— 4. Details of the above projects are at Enclosures 1 and 2 respectively.

Transport and Housing Bureau  
Environment Bureau  
March 2018

**861TH – Widening of Tai Po Road (Sha Tin Section) - construction**

**PROJECT SCOPE AND NATURE**

The proposed scope of works under the project comprises –

- (a) widening of a section of Tai Po Road (Sha Tin Section) of about 1.1 kilometres between Sha Tin Plaza near Sha Tin Rural Committee Road and Man Wo House of Wo Che Estate near Fo Tan Road from dual two-lane to dual three-lane carriageway;
- (b) modification of Sha Tin Rural Committee Road interchange, including provision of slip roads, modification of cycle track and footpath, and provision of lifts;
- (c) modification of two footbridges across Tai Po Road (Sha Tin Section) near Wo Che Street and near Fung Wo Lane respectively;
- (d) provision of noise mitigation measures including noise semi-enclosures, vertical noise barriers and cantilever noise barriers at appropriate locations; and
- (e) associated drainage works, landscape works, lighting works, environmental mitigation measures as well as installation of traffic control and surveillance system.

Location plan, layout plan and photomontage of the proposed works are at Annexes 1 to 4 of Enclosure 1 respectively.

2. Regarding the arrangement for the construction works, another project administrated by the Highways Department (HyD) (PWP Item **804TH** – Retrofitting of Noise Barriers on Tai Po Road (Sha Tin Section), please refer to Enclosure 2 for details) will retrofit noise barriers at both ends of the proposed widening of Tai Po Road (Sha Tin Section), i.e. the road sections between Scenery Court and Citylink Plaza and between Wo Che Estate and Fo Tan Road. In order to minimise disturbance to the road users and residents concerned, HyD will entrust the noise barrier works under Item 804TH to Civil Engineering and Development Department (CEDD) for implementation under the works contract of **861TH** in one go. The locations and scopes of **804TH** and **861TH** are shown at Annex 1 to Enclosure 1.

3. Subject to funding approval of the Finance Committee (FC) in the second quarter of 2018, we plan to commence the construction works in the second quarter of 2018 for completion in about the second half of 2023. To meet the construction programme, the Civil Engineering and Development Department (CEDD) invited tenders for the works contract in January 2018 in order to start the construction works as soon as possible, but the works contract will only be awarded upon obtaining funding approval from the FC for both the proposed works and **804TH**.

## JUSTIFICATION

4. Tai Po Road (Sha Tin Section) is an important primary distributor road linking the Northeast New Territories with West Kowloon (through Tsing Sha Highway) and Tsuen Wan (through Shing Mun Tunnel).

5. At present, Tai Po Road between Sha Tin Plaza near Sha Tin Rural Committee Road and Man Wo House of Wo Che Estate near Fo Tan Road is a dual two-lane carriageway. Traffic congestion frequently occurs at Tai Po Road (Sha Tin Section) during peak hours. According to the traffic impact assessment of the Project, it is envisaged that the congestion will worsen in view of the continued development in Sha Tin and northern New Territories.

6. We therefore need to widen Tai Po Road (Sha Tin Section) and modify the Sha Tin Rural Committee Road interchange to meet the traffic demand and to minimise traffic congestion. Upon completion of the proposed works, it is anticipated that the volume/capacity (v/c) ratios<sup>1</sup> during peak hours at Tai Po Road (Sha Tin Section) in 2026 will be improved as shown in Table 1 below. Also, the travelling time for the Kowloon bound morning traffic from Ma Liu Shui to New Town Plaza, which is adjacent to the proposed works, can be reduced from 20 minutes at present to about 10 minutes in 2026. This will definitely bring improvement to the traffic conditions in the vicinity.

/Table .....

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<sup>1</sup> A v/c ratio equals to or less than 1.0 is considered acceptable. A v/c ratio between 1.0 and 1.2 indicates a manageable degree of congestion. A v/c ratio above 1.2 indicates more serious congestion.



Table 1 v/c ratio <sup>1</sup>

Existing v/c ratio		v/c ratio in 2026 without the proposed works		v/c ratio in 2026 with the proposed works	
Morning peak hour Kowloon bound	Afternoon peak hour Tai Po bound	Morning peak hour Kowloon bound	Afternoon peak hour Tai Po bound	Morning peak hour Kowloon bound	Afternoon peak hour Tai Po bound
1.12	1.25	1.34	1.39	1.07	1.01

## FINANCIAL IMPLICATIONS

7. We estimate the cost of the proposed works to be \$2,739.7 million in MOD prices (please see paragraph 8 below), with the following breakdown –

		\$ million (in MOD price)
(a)	Roadworks	274.4
(b)	Modification of Sha Tin Rural Committee Road interchange	411.0
(c)	Modification of footbridges	16.8
(d)	Noise mitigation measures	1,481.5
(i)	Superstructures	635.9
(ii)	Substructures	845.6
(e)	Landscaping works	6.1
(f)	Consultants' fees	38.1
(i)	Contract administration	6.9
(ii)	Management of resident site staff (RSS)	21.9
(iii)	Environmental monitoring and audit (EM&A) programme and independent environmental checker	9.3
(g)	Remuneration of RSS	219.0

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	<b>\$ million (in MOD price)</b>
(h) Contingencies	<u>292.8</u>
Total	<u>2,739.7</u>

— A breakdown of the estimates for consultants' fees and RSS costs by man-month is at Annex 5 of Enclosure 1.

8. Subject to funding approval, we plan to phase the expenditure as follows –

<b>Year</b>	<b>\$ million (MOD)</b>
2018-2019	150.0
2019-2020	600.9
2020-2021	802.9
2021-2022	695.0
2022-2023	357.5
2023-2024	76.8
2024-2025	31.4
2025-2026	25.2
	<u>2,739.7</u>

9. 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 from 2018 to 2026. Subject to funding approval, we will deliver the works under New Engineering Contract (NEC) form<sup>2</sup>. The contract will provide for price adjustment.

10. We estimate the annual recurrent expenditure arising from the proposed works to be about \$8.3 million.

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<sup>2</sup> NEC is a suite of contracts developed by the Institution of Civil Engineers, United Kingdom. It is a contract form that emphasizes cooperation, mutual trust and collaborative risk management between contracting parties.

**PUBLIC CONSULTATION**

11. CEDD commenced an investigation study for the proposed works in early 2013, which comprised the study on the environmental impact of the proposed works and technical investigations of the proposed works. Subsequently, CEDD conducted a two-stage public engagement exercise, including focus group meetings and a public forum in Sha Tin district in 2013 and 2014 respectively. CEDD then developed the scheme of the proposed works having taken into account views collected from the public engagement exercise. CEDD consulted the Traffic and Transport Committee (T&TC) of Sha Tin District Council on the scheme on 6 January 2015 and obtained T&TC's support.

12. We gazetted the road scheme for the proposed works under the Roads (Works, Use and Compensation) Ordinance (Cap. 370) on 14 and 21 August 2015. During the statutory period, no objection was received and the scheme was thus authorised accordingly. The authorisation notice of the Project was gazetted on 4 and 11 December 2015.

13. Subsequently, CEDD developed an amendment scheme to enhance the pedestrian route at the Sha Tin Rural Committee Road interchange, including modification of the location of a lift at the interchange. CEDD consulted the T&TC on 5 July 2016 and obtained its support. We then gazetted the amendment scheme under the Roads (Works, Use and Compensation) Ordinance (Cap. 370) on 25 November and 2 December 2016. During the statutory period, no objection was received and the scheme was thus authorised accordingly. The authorisation notice of the proposed works was gazetted on 3 and 10 March 2017.

14. CEDD consulted the Advisory Committee on the Appearance of Bridge and Associated Structures<sup>3</sup> on the aesthetic design of the proposed noise mitigation measures, vehicular bridge and modified piers of footbridges under the Project. The Committee accepted the proposed aesthetic design.

15. We consulted the Legislative Council Panel on Transport on 19 January 2018. Members supported the project and urged for early implementation of the project.

**/ENVIRONMENTAL .....**

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<sup>3</sup> The Advisory Committee on the Appearance of Bridges and Associated Structures comprises representatives of the Hong Kong Institute of Architects, the Hong Kong Institution of Engineers, the Hong Kong Institute of Planners, the Hong Kong Institute of Landscape Architects, academic institutions, the Architectural Services Department, the Highways Department, the Housing Department and the Civil Engineering and Development Department. It is responsible for vetting the design of bridges and other structures associated with the public highway system, including noise barriers and enclosures, from the aesthetic and visual impact points of view.

## ENVIRONMENTAL IMPLICATIONS

16. The proposed works is a designated project under Schedule 2 of the Environmental Impact Assessment (EIA) Ordinance (Cap. 499) and an environmental permit (EP) is required for its construction and operation. The EIA Report for the proposed works was approved by the Director of Environmental Protection. The EP for the construction and operation of the proposed works was issued on 20 December 2016. The EIA Report concluded that the environmental impacts of the proposed works can be controlled to within the criteria under the EIA Ordinance and the Technical Memorandum on EIA Process.

17. During construction, CEDD will incorporate requirements into the relevant works contracts to require the contractors to implement the environmental mitigation measures and EM&A programme recommended in the approved EIA Report, and comply with the relevant conditions under the EP and other statutory requirements for environmental protection. The recommended mitigation measures include installation of noise barriers and noise enclosures, use of low noise road surfacing, and implementation of the relevant pollution control measures during construction stage, including adoption of dust suppression measures, quiet powered mechanical equipment and temporary noise barriers. CEDD has included the cost for the provision of the necessary environmental mitigation measures and implementation of the EM&A programme in the project estimate.

18. At the planning and design stages, CEDD has considered all the proposed works and construction sequences to reduce generation of construction waste where possible. In addition, CEDD will require the contractors to reuse inert construction waste (e.g. materials excavated within site area for backfilling use) on site or in other suitable construction sites as far as practicable, in order to minimise disposal of inert construction waste to public fill reception facilities<sup>4</sup>. CEDD will require the contractors to maximise the use of recycled or recyclable inert construction waste, and encourage the use of non-timber formwork to further minimize the generation of construction waste.

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<sup>4</sup> Public fill reception facilities are specified in Schedule 4 of the Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap 354N). Disposal of inert construction waste in public fill reception facilities requires a license issued by the Director of Civil Engineering and Development.

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

20. CEDD estimated that the proposed works will generate in total 86 000 tonnes of construction waste. Of these, we will reuse 15 000 tonnes (17 %) of inert construction waste on site and deliver 68 500 tonnes (80%) of inert construction waste to public fill reception facilities for subsequent reuse. We will dispose of the remaining 2 500 tonnes (3%) of non-inert construction waste at landfills. The total cost for accommodating construction waste at public fill reception facilities and landfill sites for the proposed works is estimated to be \$5.4 million (based on a unit charge rate of \$71 per tonnes for disposal at public fill reception facilities and \$200 per tonne at landfills as stipulated in the Waste Disposal (Charges for Disposal of Construction Waste) Regulation) (Cap 354N)).

## **HERITAGE IMPLICATIONS**

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

## **LAND ACQUISITION**

22. The proposed works does not require any land acquisition.

## **BACKGROUND INFORMATION**

23. We upgraded **861TH** to Category B in September 2012.

24. CEDD engaged consultants to carry out an investigation study for the Project at an estimated cost of \$9.9 million in MOD prices in March 2013. The cost was charged to the block allocation **Subhead 7100CX** “New towns and urban area works, studies and investigations for items in Category D of the Public Works Programme”. The relevant investigation works have been completed.

25. On 10 July 2015, the FC approved the upgrading of part of **861TH** to Category A as **869TH** as “Widening of Tai Po Road (Sha Tin Section) – detailed design and site investigation” at an estimated cost of \$43.2 million in MOD prices. CEDD engaged consultants in December 2015 to carry out the detailed design and site investigation. The detailed design and site investigation have been largely completed.

26. There are 351 trees within the project boundary, among them, 87 trees including three important trees<sup>5</sup> will be preserved. The proposed works will require removal of 264 trees, including 256 trees to be felled and 8 trees to be transplanted within the project boundary. CEDD will incorporate into the planting proposals of the proposed works, including the planting of 256 whips and about 30 000 shrubs at various locations.

27. We estimate that the proposed works will create about 540 jobs (430 for labourers and 110 for professional or technical staff) providing a total employment of 29 600 man-months.

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

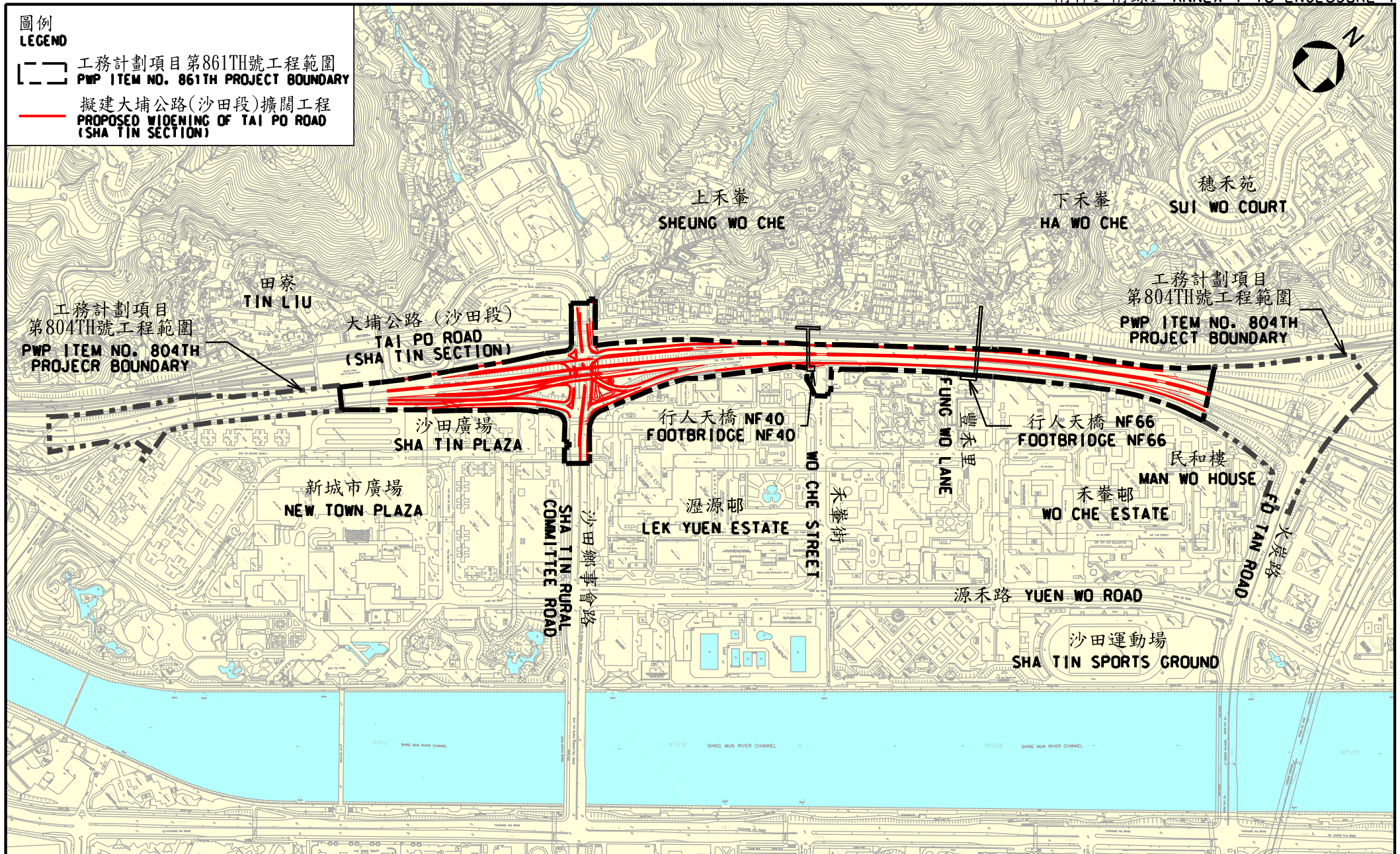
- (a) trees of 100 years old or above;
- (b) trees of cultural, historical or memorable significance e.g. Fung Shui tree, tree as landmark of monastery or heritage monument, and trees in memory of an important person or event;
- (c) trees of precious or rare species;
- (d) trees of outstanding form (taking 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 to or exceeding 1.0 m (measured at 1.3 m above ground level), or with height/canopy spread equal to or exceeding 25m.



圖例  
LEGEND

工務計劃項目第861TH號工程範圍  
PWP ITEM NO. 861TH PROJECT BOUNDARY

擬建大埔公路(沙田段)擴闊工程  
PROPOSED WIDENING OF TAI PO ROAD  
(SHA TIN SECTION)



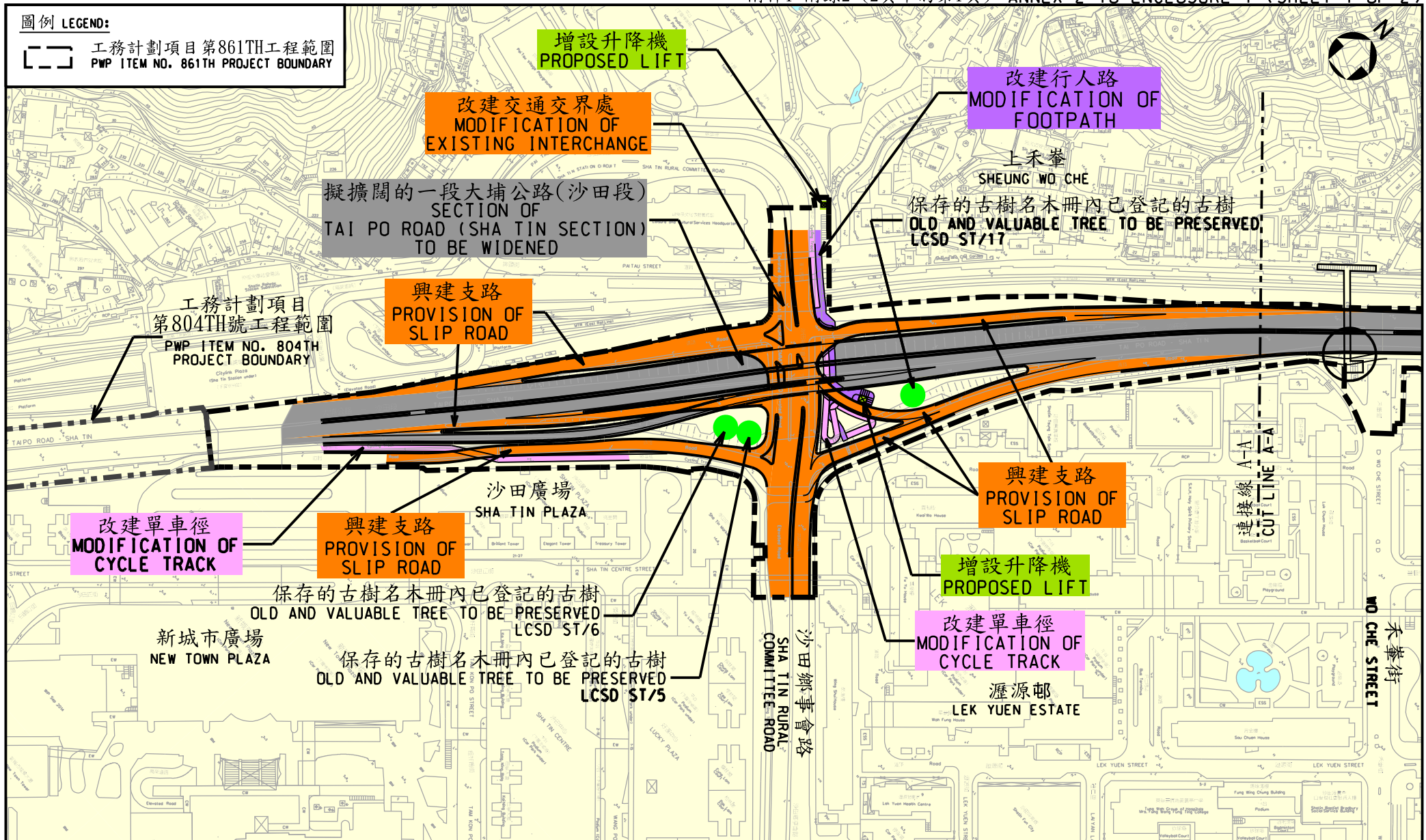
圖則名稱 drawing title

工務計劃項目第861TH號 - 大埔公路(沙田段)擴闊工程 - 位置圖  
PWP ITEM NO. 861TH -  
WIDENING OF TAI PO ROAD (SHA TIN SECTION) - LOCATION PLAN



圖例 LEGEND:

工務計劃項目第861TH工程範圍  
PWP ITEM NO. 861TH PROJECT BOUNDARY



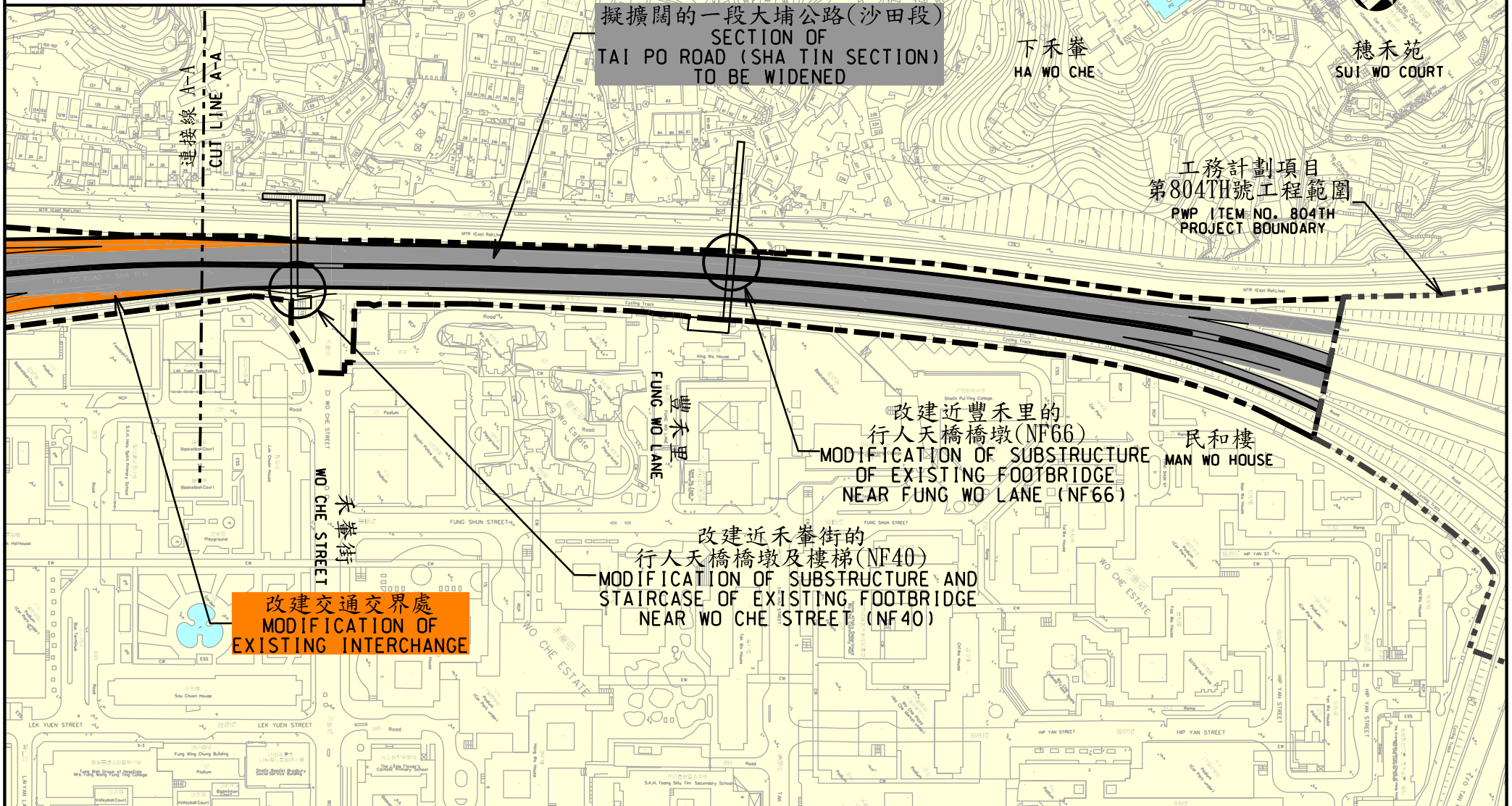
圖則名稱 drawing title

工務計劃項目第861TH號 - 大埔公路(沙田段)擴闊工程 - 平面圖  
PWP ITEM NO. 861TH - WIDENING OF TAI PO ROAD (SHA TIN SECTION) - LAYOUT PLAN  
(2頁中的第1頁) (SHEET 1 OF 2)



**圖例 LEGEND:**

工務計劃項目第861TH工程範圍  
PWP ITEM NO. 861TH PROJECT BOUNDARY

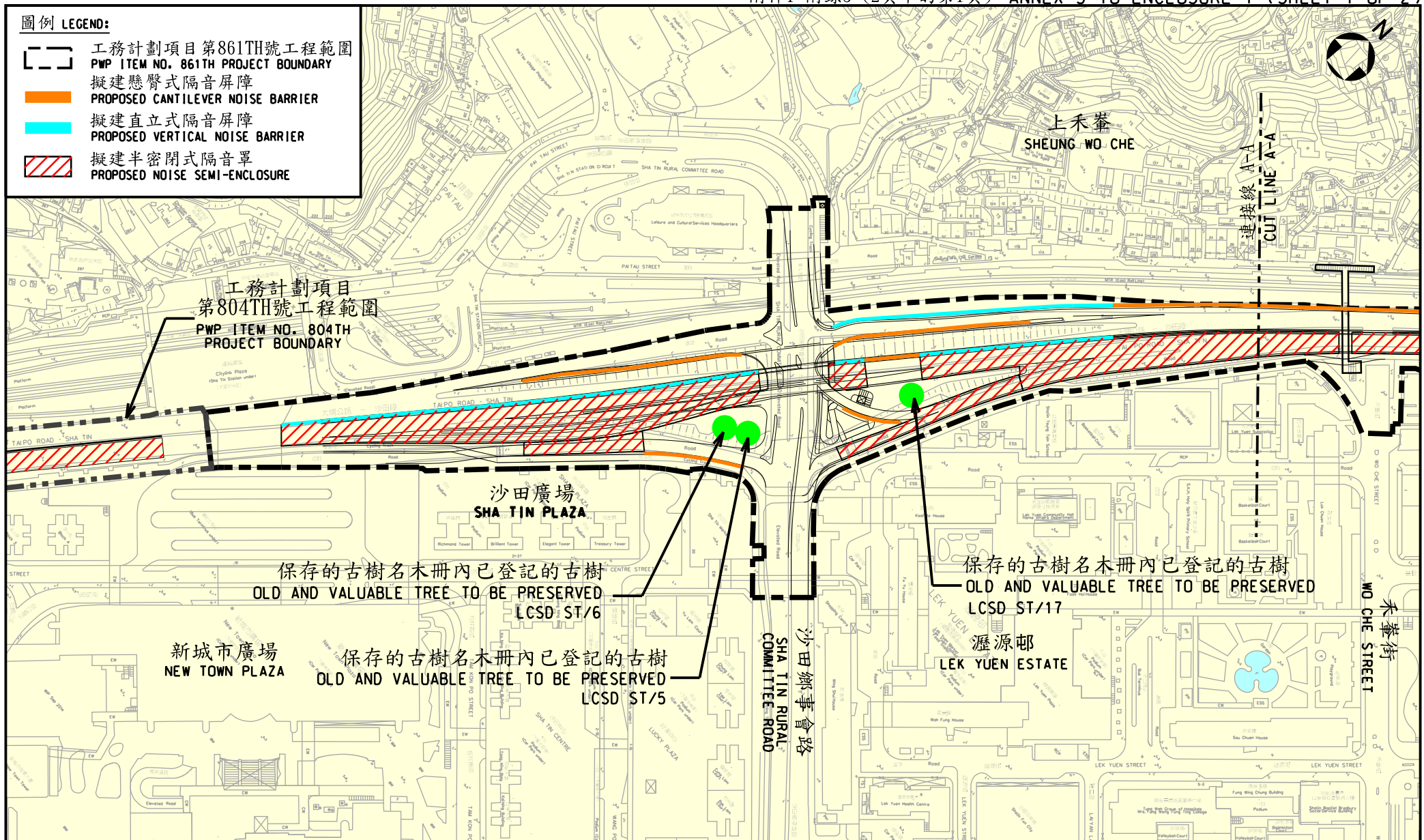


圖則名稱 drawing title

工務計劃項目第861TH號 - 大埔公路(沙田段)擴闊工程 - 平面圖  
PWP ITEM NO. 861TH - WIDENING OF TAI PO ROAD (SHA TIN SECTION) - LAYOUT PLAN  
(2頁中的第2頁) (SHEET 2 OF 2)

## 圖例 LEGEND:

- 工務計劃項目第861TH號工程範圍  
PWP ITEM NO. 861TH PROJECT BOUNDARY
- 擬建懸臂式隔音屏障  
PROPOSED CANTILEVER NOISE BARRIER
- 擬建直立式隔音屏障  
PROPOSED VERTICAL NOISE BARRIER
- 擬建半密閉式隔音罩  
PROPOSED NOISE SEMI-ENCLOSURE







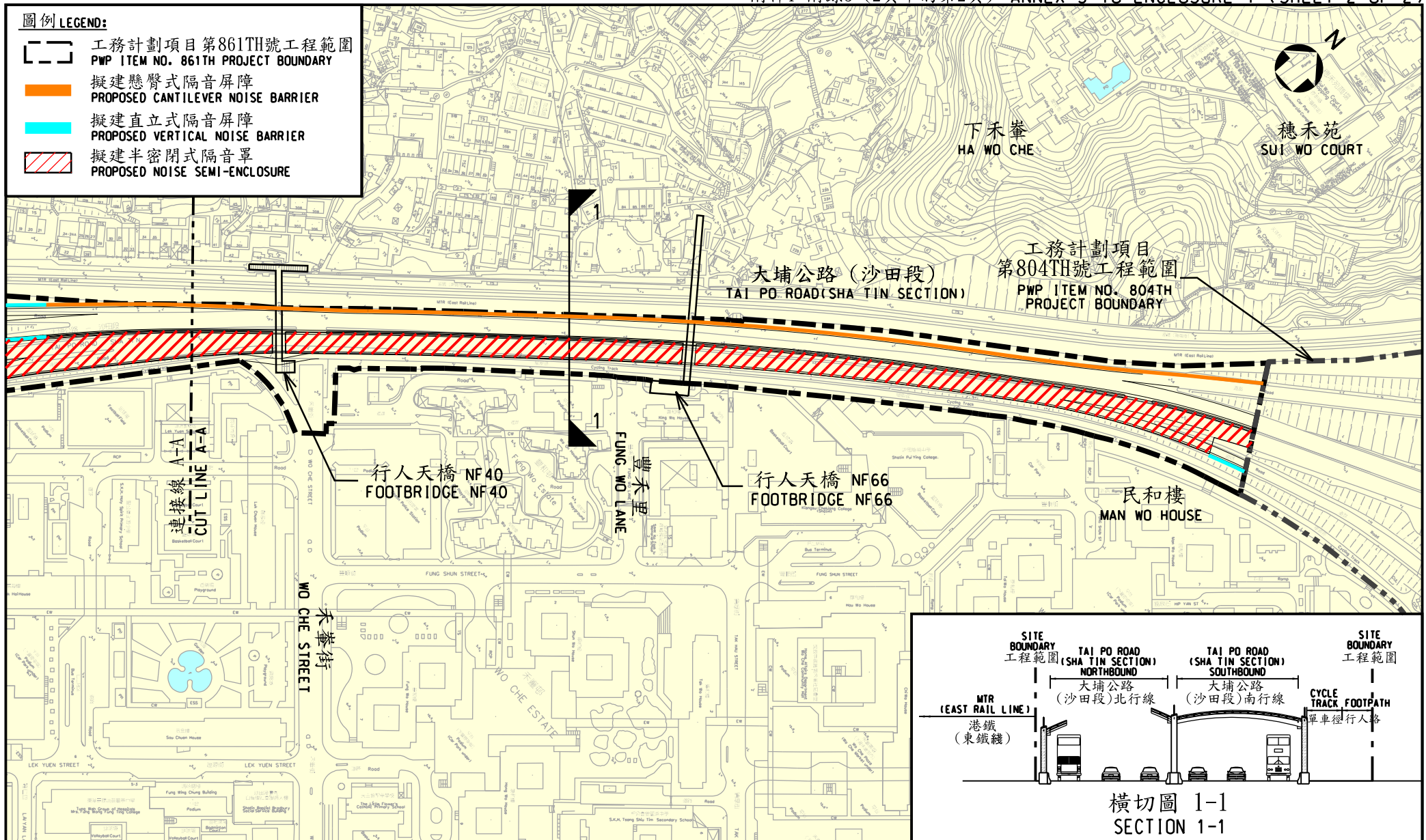
圖則名稱 drawing title

工務計劃項目第861TH號 - 大埔公路 (沙田段) 擴闊工程 - 噪音緩解措施平面圖  
PWP ITEM NO. 861TH - WIDENING OF TAI PO ROAD (SHA TIN SECTION) -  
NOISE MITIGATION MEASURES LAYOUT PLAN  
(2頁中的第1頁) (SHEET 1 OF 2)



圖例 LEGEND:

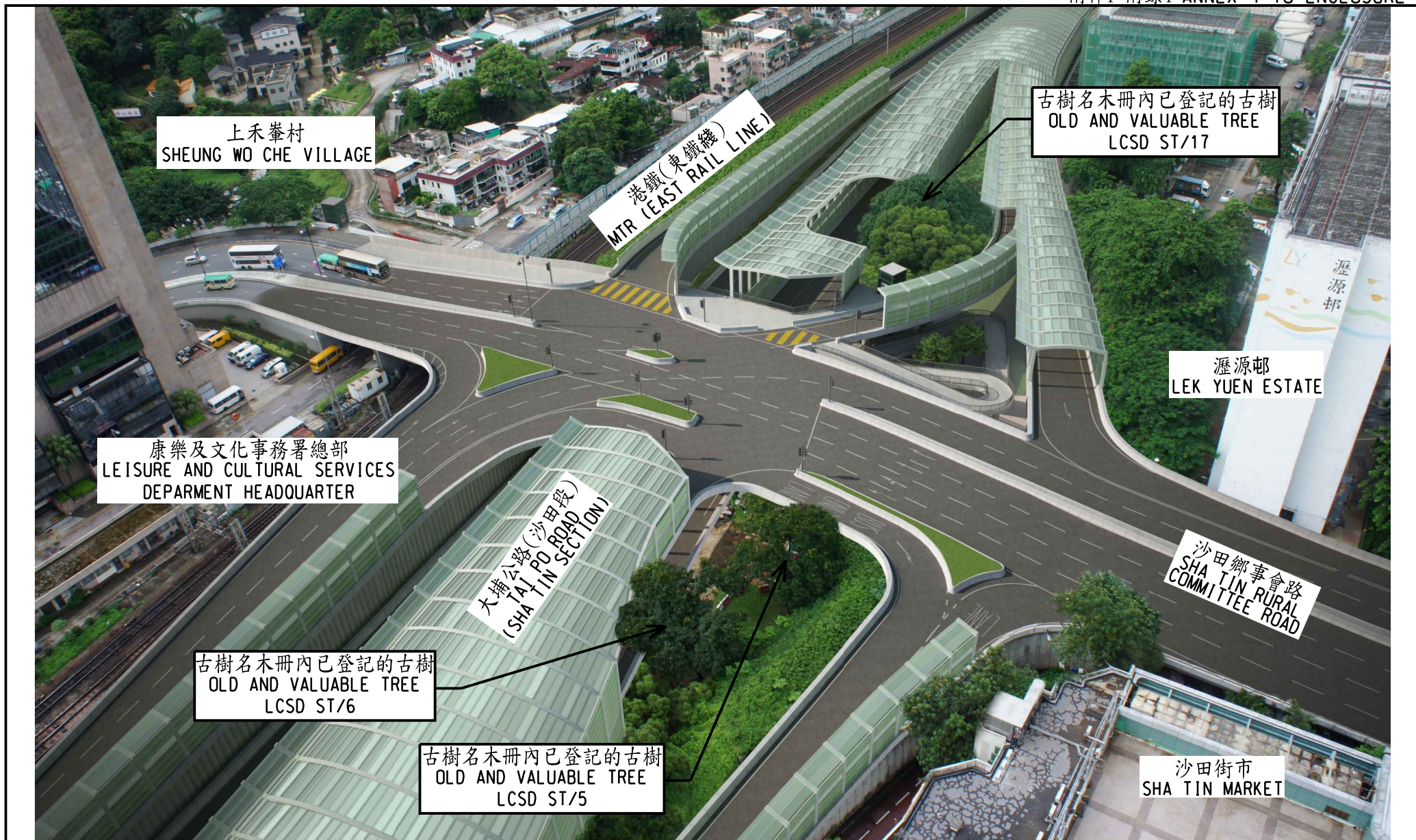
-  工務計劃項目第861TH號工程範圍  
PWP ITEM NO. 861TH PROJECT BOUNDARY
-  擬建懸臂式隔音屏障  
PROPOSED CANTILEVER NOISE BARRIER
-  擬建直立式隔音屏障  
PROPOSED VERTICAL NOISE BARRIER
-  擬建半密閉式隔音罩  
PROPOSED NOISE SEMI-ENCLOSURE



圖則名稱 drawing title

工務計劃項目第861TH號 - 大埔公路 (沙田段) 擴闊工程 - 噪音緩解措施平面圖  
PWP ITEM NO. 861TH - WIDENING OF TAI PO ROAD (SHA TIN SECTION) -  
NOISE MITIGATION MEASURES LAYOUT PLAN  
(2頁中的第2頁) (SHEET 2 OF 2)





圖則名稱 drawing title

工務計劃項目第861TH號 - 完工後的沙田鄉事會路交匯處模擬照片  
PWP ITEN NO. 861TH - PHOTOMONTAGE OF SHA TIN RURAL COMMITTEE ROAD INTERCHANGE AFTER COMPLETION

**861TH – Widening of Tai Po Road (Sha Tin Section) - construction****Breakdown of estimates for consultants' fees and resident site staff costs  
(in September 2017 prices)**

		Estimated man- months	Average MPS* salary point	Multiplier (Note 1)	Estimated fee (\$ million)	
(a) Consultants' fees for						
(i) Contract administration (Note 2)	Professional	-	-	-	5.3	} 6.0#
	Technical	-	-	-	0.7	
(ii) Environmental monitoring and audit programme (Note 3)	Professional	25	38	2.0	3.9	} 8.0#
	Technical	51	14	2.0	2.8	
(iii) Independent environmental checker (Note 3)	Professional	5	38	2.0	0.8	
	Technical	10	14	2.0	0.5	
				Sub-total	14.0	
(b) Resident site staff (RSS) costs (Note 4)	Professional	755	38	1.6	95.2	
	Technical	2 501	14	1.6	110.0	
				Sub-total	205.2	
Comprising –						
(i)	consultants' fee for management of RSS				18.7#	
(ii)	remuneration of RSS				186.5#	
				<b>Total</b>	<b>219.2</b>	

\* MPS = Master Pay Scale

**Notes**

1. A multiplier of 1.6 is applied to the average MPS salary point to estimate the cost of RSS supplied by the consultants. A multiplier of 2.0 is applied to the average MPS salary point to estimate the full staff cost for the staff employed in the consultants' office (including the consultants' overheads and profit) (as at now, MPS point 38 = \$78,775 per month and MPS point 14 = \$27,485 per month).
2. The consultants' staff cost for contract administration is calculated in accordance with the existing agreement for the design and construction of **861TH**. The construction phase of the assignment will only be executed subject to Finance Committee's approval to upgrade **861TH** to Category A.

3. The actual man-months and actual costs will only be known after selection of the consultants.
4. The actual man-months and fees will only be known after completion of the construction works.

**Remarks**

The figures in this Enclosure are shown in constant prices to correlate with the MPS salary point of the same year. The figures marked with # are shown in money-of-the-day price in paragraph 7 of this paper.

**804TH – Retrofitting of Noise Barriers on  
Tai Po Road (Sha Tin Section)**

**PROJECT SCOPE AND NATURE**

The proposed scope of works under the project includes –

- (a) retrofitting of the following noise barriers and enclosures on an approximately 410 metres section of Tai Po Road (Sha Tin Section) between Scenery Court and Citylink Plaza –
  - (i) 2 sections of noise semi-enclosure (6 to 12 metres high) of about 260 metres in total length over the southbound carriageway with a 2 metres cantilevered section extending over the northbound carriageway;
  - (ii) a section of cantilevered noise barrier (6.5 metres high) of about 70 metres in length along the verge of the southbound carriageway;
  - (iii) a section of vertical noise barrier (5 metres high) of about 155 metres in length along the central median; and
  - (iv) 2 sections of vertical noise barrier (6 metres high) of about 220 metres in total length along the verge of the northbound carriageway;
- (b) retrofitting of the following noise barriers and enclosures on an approximately 180 metres section of Tai Po Road (Sha Tin Section) between Wo Che Estate and Fo Tan Road –
  - (i) a section of noise semi-enclosure (6 metres high) of about 110 metres in length over the southbound carriageway with a 2 metres cantilevered section extending over the northbound carriageway;

/(ii) .....



- (ii) a section of vertical noise barrier (5 metres high) of about 170 metres in length along the verge of the southbound carriageway;
  - (iii) a section of cantilevered noise barrier (6 metres high) of about 110 metres in length along the verge of the northbound carriageway; and
  - (iv) a section of vertical noise barrier (2 to 5 metres high) of about 90 metres in length along the verge of the northbound carriageway;
- (c) associated works on lighting, slope, drainage, traffic aids and landscaping, as well as permanent closure of part of the verge area for retrofitting of noise enclosures; and
  - (d) implementation of an environmental monitoring and audit (EM&A) programme for the works mentioned in (a) to (c) above.

———— The layout plan and section plan of the proposed works are at Annexes 1 and 2 to Enclosure 2 respectively.

2. To harmonise the aesthetic design of the proposed noise barriers and enclosures with the surrounding environment as well as to attain the required performance of the noise barriers and enclosures, some of the noise panels will be of absorptive panel design while some of transparent and translucent panel design. We will provide planters and greening areas in the nearby areas, including the provision of climbing plants on the posts of the enclosures along the greening areas of the cycle track, to improve the aesthetics. The artist impressions of the proposed works are at Annex 3 to Enclosure 2.

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3. Regarding the arrangement for the construction works, the Civil Engineering and Development Department (CEDD) has proposed to carry out road widening works between the two road sections mentioned above (PWP Item No. **861TH** – Widening of Tai Po Road (Sha Tin Section), please refer to Enclosure 1 for details). In order to minimise the inconvenience caused to the residents concerned and road users during the construction stage, the CEDD and Highways Department plan to carry out the two projects under one single works contract. The locations and scopes of **804TH** and **861TH** are shown at Annex 4 to Enclosure 2.

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4. Subject to funding approval of the Finance Committee (FC), we plan to commence the construction works for both **804TH** and **861TH** projects in the second quarter of 2018. As it is necessary to coordinate the two projects during construction, it is targeted to complete this project together with the **861TH** project in the second half of 2023.

## JUSTIFICATIONS

5. To mitigate the traffic noise impact of existing roads on neighbouring residents, it is the Government's policy, where practicable and subject to availability of resource, to study the implementation of direct noise mitigation measures on existing roads generating traffic noise at neighbouring residents at levels exceeding 70 dB(A)<sup>1</sup>. Such measures include retrofitting of noise barriers and enclosures on roads, and road resurfacing with low noise materials.

6. Currently, a total of 2 240 dwellings near the section of Tai Po Road (Sha Tin Section) between Scenery Court and Citylink Plaza and that between Wo Che Estate and Fo Tan Road are affected by traffic noise at levels exceeding 70 dB(A). This project proposes to retrofit noise barriers and semi-enclosures on the above road sections to reduce the traffic noise levels at the concerned dwellings. Having regard to the site constraints such as inadequate space at the road verge or the central median at some locations, the noise reduction effects provided by the proposed noise barriers and semi-enclosures would vary. The details of the traffic noise improvement are provided in Annex 5 to Enclosure 2.

## FINANCIAL IMPLICATIONS

7. We estimate the capital cost of the proposed project to be \$851.8 million in MOD prices, broken down as follows –

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<sup>1</sup> Road traffic noise level is specified in terms of L<sub>10</sub>(1 hour) which is the noise level exceeded for 10% of a one-hour period and is generally measured at peak traffic flow. The traffic noise limit of 70 dB(A) for residential premises as stipulated in the Hong Kong Planning Standards and Guidelines is adopted as the criterion for studying the implementation of noise mitigation measures under existing policy.

		\$ million (in MOD prices)
(a)	Noise barriers and enclosures	607.0
	(i) Superstructure	271.4
	(ii) Foundation	335.6
(b)	Associated lighting, slope, drainage, traffic aids and landscaping works	89.8
(c)	Consultants' fees	8.8
	(i) Contract administration	1.9
	(ii) Management of resident site staff (RSS)	6.9
(d)	Remuneration of RSS	69.1
(e)	Contingencies	77.1
Total		<hr/> 851.8 <hr/>

8. In respect of the noise barriers and enclosures mentioned in paragraph 7(a) above, their structural design life is about 120 years. The estimated cost is \$607 million, covering the installation of semi-enclosures of about 370 metres in length and 6 to 12 metres in height, cantilevered noise barriers of about 180 metres in length and 6 to 6.5 metres in height, and vertical noise barriers of about 635 metres in length and 2 to 6 metres in height. A breakdown of the estimated cost is at Annex 6 to Enclosure 2.

9. We propose to engage consultants to take up the contract management and site supervision works of the project. A breakdown of the estimates for consultants' fees and RSS costs by man-month is at Annex 7 to Enclosure 2.

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

Year	\$ million (MOD)
2018-2019	49.3
2019-2020	115.5
2020-2021	160.3
2021-2022	141.0
2022-2023	127.7
2023-2024	105.9
2024-2025	94.9
2025-2026	57.2
	<hr/>
	851.8
	<hr/>

11. 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 from 2018 to 2026. Subject to funding approval, we will deliver the works under "New Engineering Contract" (NEC) form<sup>2</sup> with condition imposed for adjustable prices. CEDD has already initiated parallel tendering for the contract in January 2018 in order to start the construction works as soon as possible. Nevertheless, the construction contract will be awarded only after obtaining funding approval from FC.

12. We estimate the annual recurrent expenditure arising from the proposed works to be about \$1.4 million.

/PUBLIC .....

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<sup>2</sup> NEC is a suite of contracts developed by the Institution of Civil Engineers, United Kingdom. It is a contract form that emphasises a spirit of mutual trust, cooperation and collaborative risk management between contract parties.

## **PUBLIC CONSULTATION**

13. The Health and Environment Committee of Sha Tin District Council was consulted on the proposed project on 7 July 2016, and its members agreed that the project should be carried out to alleviate the traffic noise impact on nearby residents. The scheme and plans of the proposed project were gazetted under the Roads (Works, Use and Compensation) Ordinance (Cap. 370) (the Ordinance) on 30 September 2016 and 7 October 2016 respectively. No objection was received during the statutory period, the project was authorised. The notice of authorisation was gazetted on 30 December 2016 and 6 January 2017.

14. The aesthetic design of the proposed noise barriers and enclosures was submitted to the Advisory Committee on the Appearance of Bridges and Associated Structures (ACABAS)<sup>3</sup> for consultation in October 2017. The Committee supported and accepted the proposed aesthetic design.

15. We consulted the Legislative Council Panel on Environmental Affairs on 22 January 2018 on the proposed works. Members supported the submission of the funding proposal to the Public Works Subcommittee for consideration. Regarding the information requested by the members including the details of the traffic noise improvement provided by and the design life of the proposed noise barriers and enclosures, as well as the measures to manage the felled trees, they are provided in Annex 5 to Enclosure 2, paragraph 8 above and paragraph 25 below respectively.

## **ENVIRONMENTAL IMPLICATIONS**

16. The proposed project is not a designated project under the Environmental Impact Assessment Ordinance (Cap. 499). We have conducted an environmental review and the conclusion is that the works concerned will not cause adverse long-term environmental impact.

/17. ....

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<sup>3</sup> The ACABAS comprises representatives of the Hong Kong Institute of Architects, the Hong Kong Institution of Engineers, the Hong Kong Institute of Planners, academic institutions, Architectural Services Department, Highways Department, Housing Department and CEDD. It 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.

17. To minimise short-term impact during construction, we will implement mitigation measures to control the nuisances caused by construction noise, dust and site run-off in compliance with the established standards and guidelines. We will also carry out the EM&A programme to ensure proper implementation of the recommendations of the environmental review.

18. At the planning stage, we have considered the design and construction sequences of the proposed works to reduce the generation of construction waste wherever possible. In addition, the contractor will be required to reuse inert construction waste (e.g. excavated soil) on site or in other suitable construction sites as far as possible, in a bid to minimise the disposal of inert construction waste at public fill reception facilities<sup>4</sup>. The contractor will also be encouraged to maximise the use of recycled or recyclable inert construction waste and the use of non-timber formwork to further reduce the generation of construction waste.

19. At the construction stage, the contractor will have to submit for approval a plan setting out the waste management measures, which should include appropriate mitigation actions 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, and will require the contractor to separate the inert portion from non-inert construction waste on site for disposal at appropriate facilities. Disposal of inert and non-inert construction waste at public fill reception facilities and landfills respectively will be supervised through a trip-ticket system.

20. We estimate that the proposed works will generate 43 500 tonnes of construction waste. Of these, we will reuse about 24 600 tonnes (57%) of inert construction waste on site and deliver around 17 550 tonnes (40%) of inert construction waste to public fill reception facilities for subsequent reuse. We will dispose of the remaining 1 350 tonnes (3%) of non-inert construction waste at landfills. The total cost for disposal of construction waste at public fill reception facilities and landfill sites is estimated to be about \$1.52 million for the proposed works (based on a unit charge rate of \$71 per tonne for disposal at public fill reception facilities and \$200 per tonne at landfills as stipulated in the Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 354N)).

**/HERITAGE .....**

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<sup>4</sup> Public fill reception facilities are specified in Schedule 4 of the Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 354N). Disposal of inert construction waste at public fill reception facilities requires a licence issued by the Director of Civil Engineering and Development.

## HERITAGE IMPLICATIONS

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

## LAND ACQUISITION

22. The proposed project does not require any land resumption.

## BACKGROUND INFORMATION

23. We upgraded **804TH** to Category B in 2006 and engaged consultants to carry out the investigation study in November 2008. The original scope is to retrofit noise barriers and enclosures along the whole section of Tai Po Road (Sha Tin Section) between Scenery Court and Fo Tan Road. We then learned that CEDD proposed to carry out road widening works on the section of Tai Po Road (Sha Tin Section) between Shatin Plaza near Sha Tin Rural Committee Road and Man Wo House of Wo Che Estate near Fo Tan Road (PWP Item No. **861TH**) to meet the traffic demand. Thus, we need to review the extent and design of the proposed retrofitting works in order to match with the aforesaid road widening works.

24. CEDD upgraded **861TH** to Category B in 2012. An agreement between CEDD and Highways Department was made for CEDD to engage consultants to carry out site investigation and detailed design jointly for the **861TH** and **804TH** projects for the overall design considerations and the minimisation of the disturbance to the nearby residents and road users during construction. The estimated cost for the site investigation and detailed design for the projects is \$8.0 million which is funded under **Subhead 6100TX** "Highway works, studies and investigations for items in Category D of the Public Works Programme". The site investigation and detailed design have been largely completed.

/25. ....

25. Of the 763 trees within the proposed works boundary, 132 will be preserved and the remaining 631 have to be felled as they will block the project of retrofitting noise barriers and enclosures. Those trees to be felled are however not important trees<sup>5</sup>. We propose to plant about 1 052 whips<sup>6</sup> and 56 000 shrubs, and provide 3 900 square metres greening area. The planting proposal will be incorporated into the proposed project. We will also request the contractor to assess in accordance with the “Guidelines on Yard Waste Reduction and Treatment” and the tree conditions in order to select the appropriate measures to manage the felled trees.

26. We estimate that the proposed works will create about 170 jobs (135 for labourers and 35 for professional or technical staff), providing a total employment of 9 200 man-months.

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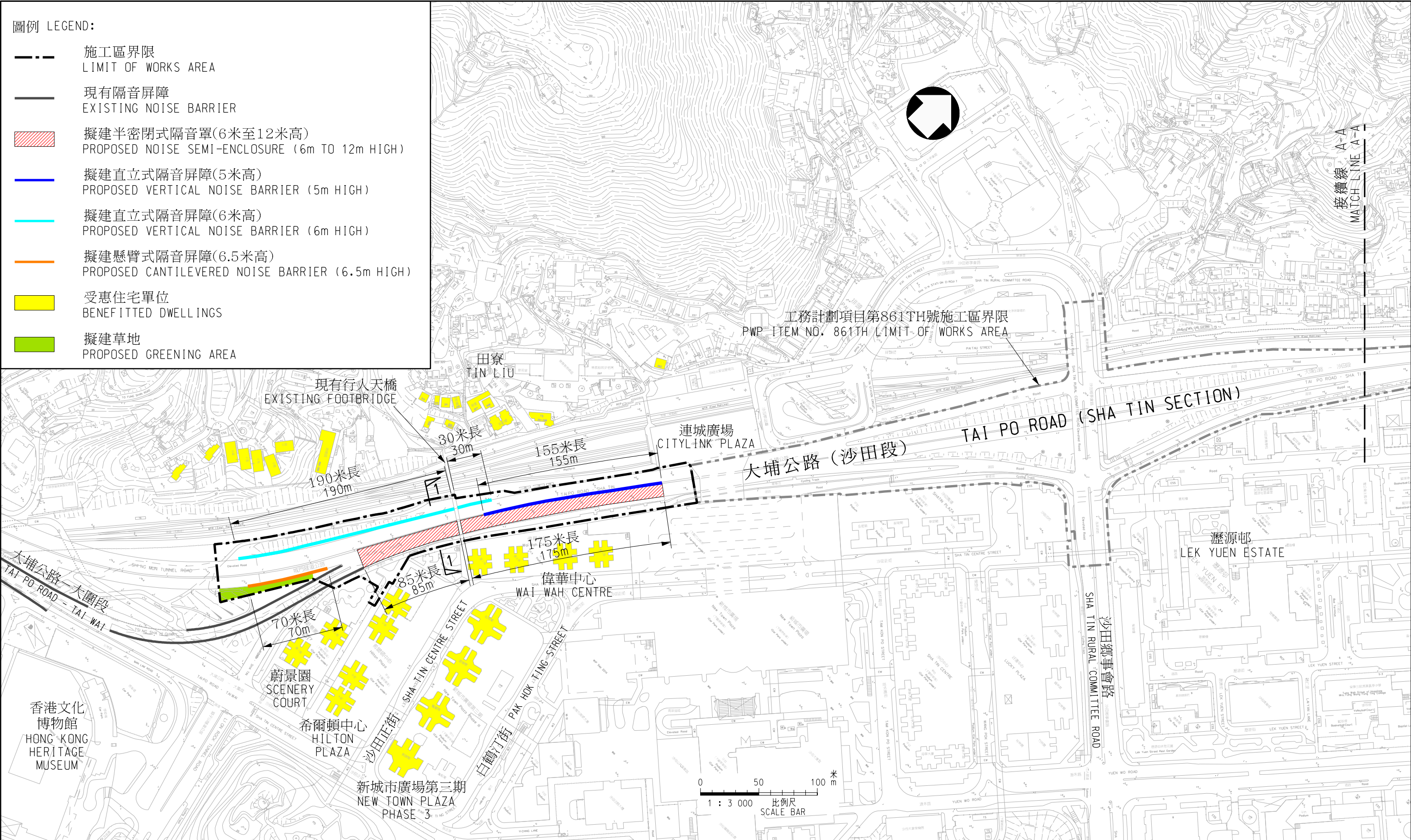
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<sup>5</sup> “Important trees” refer to trees in the Register of Old and Valuable Trees, or any other trees that meet one or more of the following criteria -

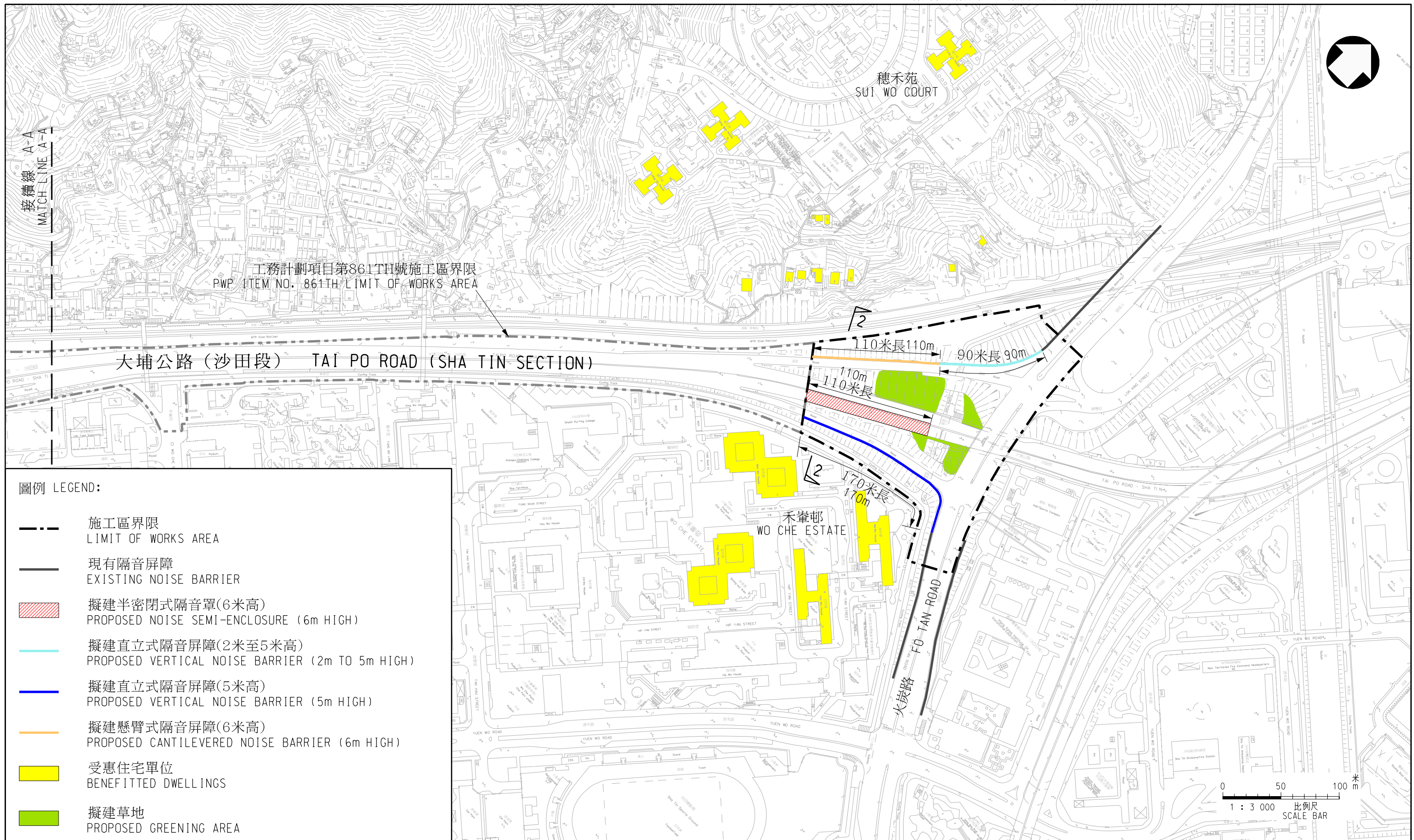
- (a) trees of over 100 years old or above;
- (b) trees of cultural, historical or memorable significance, e.g. Fung Shui trees, trees as landmark of monastery or heritage monument, and trees in memory of an important person or event;
- (c) trees of precious or rare species;
- (d) trees of outstanding 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 metres above ground level), or with height/canopy spread equal or exceeding 25 metres.

<sup>6</sup> Newly planted trees are whips that will take certain time to grow big enough to compensate for the loss in respect of landscape.









圖則名稱	plan title
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工務計劃項目第804TH號 - 大埔公路（沙田段）加建隔音屏障工程 - 平面圖

PUBLIC WORKS PROGRAMME ITEM NO. 804TH - RETROFITTING OF NOISE BARRIERS ON TAI PO ROAD (SHA TIN SECTION) - LAYOUT PLAN

(兩張圖中的第二張) (SHEET 2 OF 2)

圖則編號 plan no.

HMW6804TH-SK0135

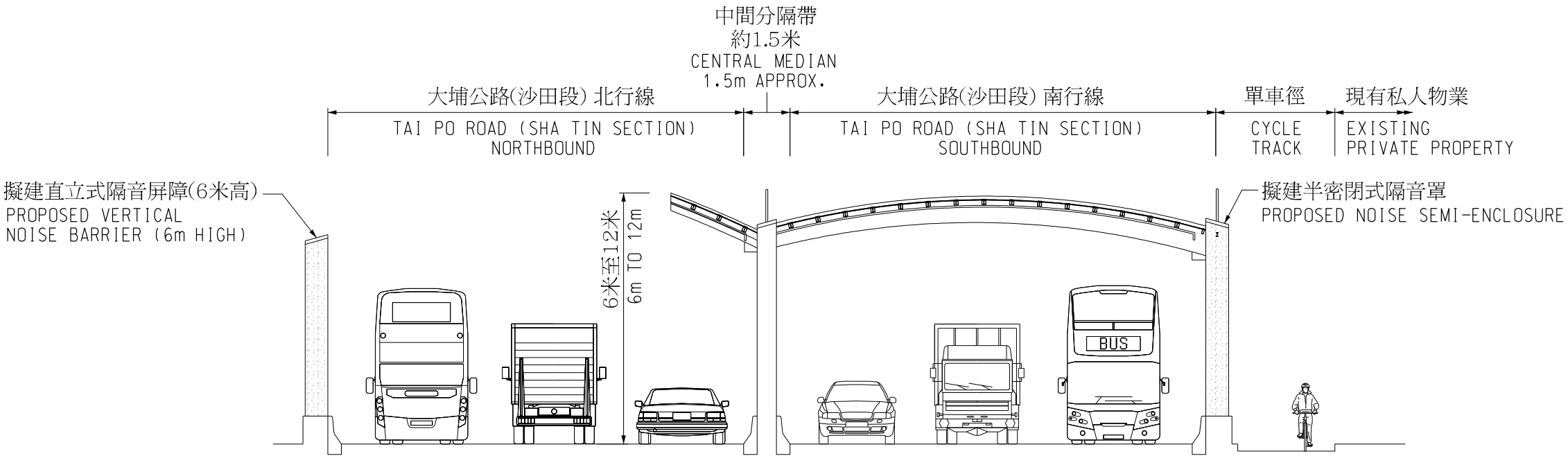
比例 scale

1:3000

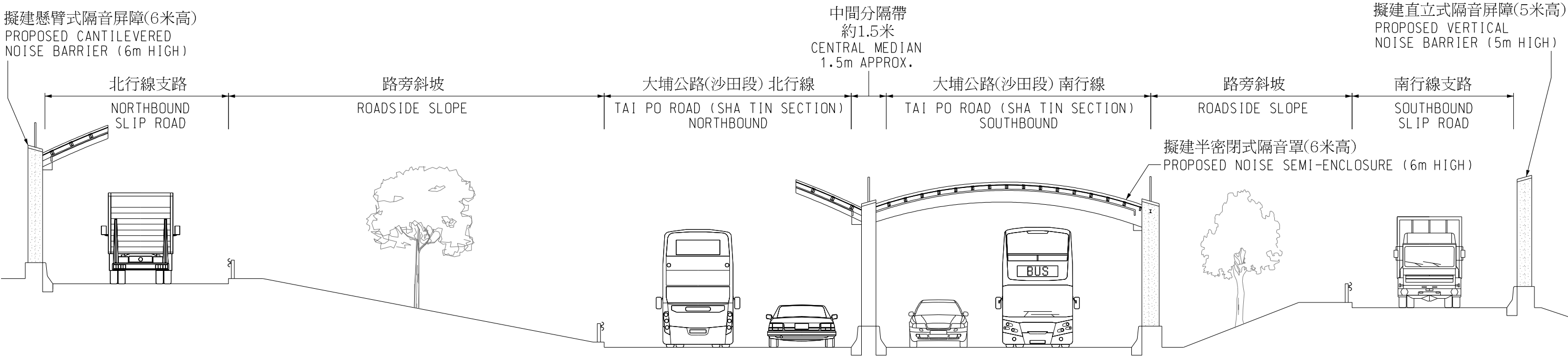
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切面圖 SECTION 1-1



切面圖 SECTION 2-2

圖則名稱 drawing title	圖則編號 drawing no.		比例 scale
	HMW6804TH-SK0128		1:150
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	<div><div><div></div><div></div></div><div>HIGHWAYS DEPARTMENT HONG KONG</div></div> <div>路 政 署</div>		

工務計劃項目第804TH號 - 大埔公路（沙田段）加建隔音屏障工程 - 切面圖  
PUBLIC WORKS PROGRAMME ITEM NO. 804TH - RETROFITTING OF NOISE BARRIERS ON TAI PO ROAD (SHA TIN SECTION) - SECTION





南端現況  
South Side Present Situation



南端完工後  
South Side Upon Completion of Proposed Works

圖則名稱 drawing title

工務項目計劃第804TH號 - 大埔公路（沙田段）加建隔音屏障工程 - 工程的外觀構思圖（兩張圖中的第一張）  
PUBLIC WORKS PROGRAMME ITEM NO. 804TH - RETROFITTING OF NOISE BARRIERS ON TAI PO ROAD (SHA TIN SECTION)  
- ARTIST'S IMPRESSION OF PROPOSED WORKS (SHEET 1 OF 2)

圖則編號 drawing no.  
HMW6804TH-SK0132

比例 scale  
示意圖  
DIAGRAMMATIC

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香港






北端現況  
North Side Present Situation



北端完工後  
North Side Upon Completion of Proposed Works

圖則名稱 drawing title

工務項目計劃第804TH號 - 大埔公路（沙田段）加建隔音屏障工程 - 工程的外觀構思圖（兩張圖中的第二張）  
PUBLIC WORKS PROGRAMME ITEM NO. 804TH - RETROFITTING OF NOISE BARRIERS ON TAI PO ROAD (SHA TIN SECTION)  
- ARTIST'S IMPRESSION OF PROPOSED WORKS (SHEET 2 OF 2)

圖則編號 drawing no. HMW6804TH-SK0133	比例 scale 示意圖 DIAGRAMMATIC
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圖則名稱 plan title	工務計劃項目第804TH號 - 大埔公路（沙田段）加建隔音屏障工程 - 加建隔音屏障工程及道路擴闊工程的位置圖		圖則編號 plan no.	比例 scale
	PUBLIC WORKS PROGRAMME ITEM NO. 804TH - RETROFITTING OF NOISE BARRIERS ON TAI PO ROAD (SHA TIN SECTION) - LOCATION PLAN FOR RETROFITTING PROJECT AND ROAD WIDENING PROJECT		HMW6804TH-SK0129	1:6000
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			 HIGHWAYS DEPARTMENT HONG KONG	路政署 香港

**804TH – Retrofitting of Noise Barriers on Tai Po Road (Sha Tin Section)****Breakdown of the number of benefitted dwellings by  
the respective level of reduction in traffic noise**

<b>Reduction in Traffic Noise (dB(A))</b>	<b>Number of Dwellings</b>
16 - 20	101
11 - 15	302
6 - 10	635
1 - 5	1 109

**Breakdown of the number of affected dwellings by  
the respective traffic noise level**

<b>Traffic Noise Level (dB(A))</b>	<b>Number of Dwellings</b>	
	<b>Before Implementation of the Proposed Mitigation Measures</b>	<b>After Implementation of the Proposed Mitigation Measures</b>
80 – 82	37	0
77 – 79	562	0
74 – 76	868	145
71 – 73	773	584
70 or below	N/A	1 511

**804TH – Retrofitting of Noise Barriers on Tai Po Road (Sha Tin Section)****Breakdown of cost estimate for different types of noise barriers/enclosures**

<b>Type of Noise Barriers</b>	<b>Cost Estimate (\$ million)</b>		
	<b>(in MOD prices)</b>		
	<b>Superstructure</b>	<b>Foundation</b>	<b>Sub-total</b>
Semi-enclosure	172.5	205.8	378.3
Cantilevered Noise Barrier	32.5	34.6	67.1
Vertical Noise Barrier	66.4	95.2	161.6
<b>Sub-total</b>	<b>271.4</b>	<b>335.6</b>	
<b>Total</b>			<b>607.0</b>

**804TH – Retrofitting of Noise Barriers on Tai Po Road (Sha Tin Section)****Breakdown of the estimates for consultants' fees and resident site staff costs  
(in September 2017 prices)**

			Estimated man- months	Average MPS* salary point	Multiplier (Note1)	Estimated fee (\$ million)
(a)	Consultants' fees for contract administration (Note 2)	Professional	–	–	–	1.3
		Technical	–	–	–	0.2
					Sub-total	1.5#
(b)	Resident site staff (RSS) costs (Note 3)	Professional	225	38	1.6	28.4
		Technical	746	14	1.6	32.8
					Sub-total	61.2
	Comprising –					
	(i) Consultants' fees for management of RSS				5.6#	
	(ii) Remuneration of RSS				55.6#	
					<b>Total</b>	<b>62.7</b>

\*MPS – Master Pay Scale

**Notes**

1. A multiplier of 1.6 is applied to the average MPS salary point to estimate the cost of RSS supplied by the consultants (as at now, MPS point 38 = \$78,775 per month and MPS point 14 = \$27,485 per month).
2. The consultant's staff cost for contract administration is calculated in accordance with the existing agreement for the design and construction of **804TH**. The construction phase of the assignment in respect of works will only be executed subject to FC's approval to upgrade **804TH** to Category A.
3. The actual man-months and actual costs will only be known after completion of the construction works.

**Remarks**

The cost figures in this Annex are shown in constant prices to correlate with the MPS salary point of the same year. The figures marked with # are shown in MOD prices in paragraph 7 of this Enclosure.