For discussion **PWSC(2019-20)4**
on 26 April 2019

ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

HEAD 706 – HIGHWAYS
Transport – Roads
832TH – Retrofitting of noise barriers on Long Tin Road

Members are invited to recommend to the Finance Committee the upgrading of **832TH** to Category A at an estimated cost of $304.0 million in money-of-the-day prices.

PROBLEM

The existing dwellings in the vicinity of the section of Long Tin Road between Parkside Villa and Park Royale are affected by excessive traffic noise and it is necessary to retrofit noise barriers on this road section.

PROPOSAL

2. The Director of Highways proposes, with the support of the Secretary for the Environment, to upgrade **832TH** to Category A at an estimated cost of $304.0 million in money-of-the-day (MOD) prices for retrofitting noise barriers on the section of Long Tin Road between Parkside Villa and Park Royale.

/**PROJECT** …..

PROJECT SCOPE AND NATURE

3. The proposed scope of works under the project includes –

(a) retrofitting of the following noise barriers on the section of Long Tin Road and its slip road between Parkside Villa and Park Royale –

(i) a section of 7.5 metres high and about 170 metres in length cantilevered noise barriers along the verge of southbound carriageway of Long Tin Road;

(ii) a section of 7.5 metres high and about 250 metres in length cantilevered noise barriers along the footpath of southbound Long Tin Road;

(iii) a section of 3 metres high and about 100 metres in length vertical noise barrier along the verge of the southbound carriageway of Long Tin Road; and

(iv) a section of 3 metres high and about 115 metres in length vertical noise barrier along the verge of the slip road to the southbound carriageway of Long Tin Road;

(b) implementation of associated works including street lighting, slope, drainage, traffic aids, utilities and landscaping works; and

(c) implementation of an environmental monitoring and audit (EM&A) programme for the works in (a) and (b) above.

The layout plan and section plan of the proposed works are at Enclosures 1 and 2 respectively.

4. To harmonise the aesthetic design of the proposed noise barriers with the surrounding environment as well as to attain the required acoustic performance of the noise barriers, some of the noise panels will be of absorptive panel design while some of translucent or transparent panel design. The artist impressions of the proposed works are at Enclosure 3.

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5. Subject to funding approval of the Finance Committee (FC), we plan to commence the construction works in the third quarter of 2019 for completion in the second half of 2023[1].

JUSTIFICATION

6. 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)[2]. Such measures include retrofitting of noise barriers and enclosures on roads, and road resurfacing with low noise materials.

7. A total of some 550 dwellings near the section of Long Tin Road between Parkside Villa and Park Royale are affected by traffic noise level exceeding 70 dB(A). The project proposes to retrofit noise barriers on the above road section to reduce traffic noise levels by about 1 to 13 dB(A), thereby benefiting about 440 dwellings in the neighbourhood. Details of the traffic noise improvement of the proposed projects and the location map of the benefitted dwellings are at Enclosures 4 and 5 respectively.

FINANCIAL IMPLICATIONS

8. We estimate that the capital cost of the proposed project will be $304.0 million in MOD prices[3], broken down as follows –

/(a) .....

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[1] The two sections of cantilevered noise barriers along Long Tin Road in this project are expected to be completed in 2022, bringing earlier benefit to majority of the affected residents. Due to limited working space, necessity to carry out works on existing structures at the same time and constraints of traffic requirements, the two sections of vertical noise barriers along the verge of the southbound carriageway of Long Tin Road and its slip road can only be completed in phases, resulting in the completion of the whole project in 2023.

[2] Road traffic noise level is specified in terms of L_{10}(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 standard of 70 dB(A) L_{10} 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.

[3] Project cost is estimated with reference to the costs of similar projects in the past.

			$ million (in MOD price)
(a)	Noise barriers		191.9
	(i) Superstructure	68.6	
	(ii) Foundation	123.3	
(b)	Associated street lighting, slope, drainage, traffic aids, utilities and landscaping works		44.5
(c)	Consultants' fees		4.5
	(i) Contract administration	1.0	
	(ii) Management of resident site staff (RSS)	3.5	
(d)	Remuneration of RSS		35.5
(e)	Contingencies		27.6
		Total	304.0

9. In respect of the noise barriers mentioned in paragraph 8(a) above, the estimated cost is $191.9 million, covering the installation of cantilevered noise barriers of about 420 metres in length and 7.5 metres in height, and vertical noise barriers of about 215 metres in length and 3 metres in height. A breakdown of the estimated cost is at Enclosure 6.

10. 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 Enclosure 7.

11. Subject to funding approval, we plan to phase the expenditure as follow –

Year	$ million (MOD)
2019-2020	4.4
2020-2021	23.8
2021-2022	33.5
2022-2023	80.2
2023-2024	78.0
2024-2025	32.4
2025-2026	32.2
2026-2027	19.5
	304.0

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 from 2019 to 2027. Subject to funding approval, we will deliver the works under New Engineering Contract (NEC) form[4] with condition imposed for adjustable prices.

13. We estimate the annual recurrent expenditure arising from the proposed works to be about $0.22 million.

/**PUBLIC** …..

[4] 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

14. The Environmental Improvement Committee of the Yuen Long District Council was consulted on the proposed project on 19 March 2018, and its members unanimously supported 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 27 July and 3 August 2018 respectively. No objection was received during the statutory period. Hence, the project was authorised under the Ordinance. The notice of authorisation was gazetted on 30 November and 7 December 2018.

15. The aesthetic design of the proposed noise barriers was submitted to the Advisory Committee on the Appearance of Bridges and Associated Structures (ACABAS)[5] for consultation in July 2018, and received support and endorsement from members of the committee.

16. We consulted the Panel on Environmental Affairs of the Legislative Council on 25 February 2019 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 Panel members on the location map of the benefited dwellings and the estimated reduction in traffic noise, they are provided in Enclosure 5.

ENVIRONMENTAL IMPLICATIONS

17. 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 benefit neighbouring residents with reduction in traffic noise levels and will not cause adverse environmental impact after completion.

18. To minimise short-term impacts 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.

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[5] 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 Civil Engineering and Development Department. 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.

19. At the planning and design stage, we have considered the design and construction sequences 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 minimise the disposal of inert construction waste at public fill reception facilities[6]. We will encourage the contractor 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.

20. At the construction stage, we will require the contractor to submit for approval a waste management plan, 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, and will require the contractor to separate the inert portion from non-inert construction waste on site and deliver for disposal at appropriate facilities. We will control the disposal of inert and non-inert construction waste at public fill reception facilities and landfills respectively through implementing a trip-ticket system.

21. We estimate that the proposed works will generate in total about 17 300 tonnes of construction waste. We will reuse about 5 100 tonnes of inert construction waste (29%) on site and deliver 12 100 tonnes of inert construction waste (70%) to public fill reception facilities for subsequent reuse. We will dispose of the remaining 100 tonnes of non-inert construction waste (1%) at landfills. For the proposed works, the total cost for accommodating the construction waste at public fill reception facilities and landfills is estimated to be about $0.88 million (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 IMPLICATIONS

22. The project 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 …..

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[6] 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.

LAND ACQUISITION

23. No land resumption is required for the proposed project.

BACKGROUND INFOMRATION

24. We upgraded the proposed project to Category B in 2008. Subsequently, we engaged a consultant to conduct further feasibility study, including preliminary site investigation, to provide preliminary feasible options for the project and relevant advance design information so as to conduct the detailed design in a faster and smoother manner in future. In 2017, we engaged consultants to carry out site investigation in more detail and subsequently the detailed design for the proposed works at an estimated cost of about $3.7 million. The cost has been paid under **Subhead 6100TX** "Highway works, studies and investigations for items in Category D of the Public Works Programme". The detailed design of the proposed works has been completed in March 2019.

25. There are some 95 trees, which are common local species and not trees of large size or important trees[7], within the proposed works boundary. Nine of these trees will be preserved and 42 will be transplanted. The remaining 44 trees have to be felled as they will block the project of retrofitting noise barriers and are considered not suitable for transplantation after survey. We propose to compensate them by planting about 75 trees and 3 200 shrubs, and this planting proposal will be incorporated into the proposed project.

26. We estimate that the proposed works will create about 65 jobs (50 for labourers and 15 for professional/technical staff), providing a total employment of 3 000 man-months.

Environment Bureau
April 2019

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[7] 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 m (measured at 1.3 m above ground level), or with height/canopy spread equal or exceeding 25 m.

圖例 LEGEND:

- 施工區界限 LIMIT OF WORKS AREA
- 現有隔音屏障 EXISTING NOISE BARRIER
- 擬建懸臂式隔音屏障(7.5米高) PROPOSED CANTILEVERED NOISE BARRIER (7.5m HIGH)
- 擬建直立式隔音屏障(3米高) PROPOSED VERTICAL NOISE BARRIER (3m HIGH)
- 受惠住宅屋苑 BENEFITTED RESIDENTIAL ESTATES

唐人新村交匯處 TONG YAN SAN TSUEN INTERCHANGE

元朗公路 YUEN LONG HIGHWAY

朗天路 LONG TIN ROAD

SHAN HA ROAD 山下路

青山公路 - 屏山段 CASTLE PEAK ROAD - PING SHAN

TOWN PARK ROAD NORTH 公園北路

170米 170m

250米 250m

100米 100m

115米 115m

A

B

C

柏麗豪園 PARKSIDE VILLA

御景園 SCENIC GARDENS

御豪山莊 PARK ROYALE

元朗公園 YUEN LONG PARK

0 50 100 m

1 : 2 500 SCALE BAR

圖則名稱 drawing title

工務計劃項目第832TH號 - 朗天路加建隔音屏障工程 - 平面圖

PUBLIC WORKS PROGRAMME ITEM NO. 832TH - RETROFITTING OF NOISE BARRIERS ON LONG TIN ROAD - LAYOUT PLAN

圖則編號 drawing no.	比例 scale
HMW6832TH-SK0027	1:2500

HIGHWAYS DEPARTMENT HONG KONG 香港路政署

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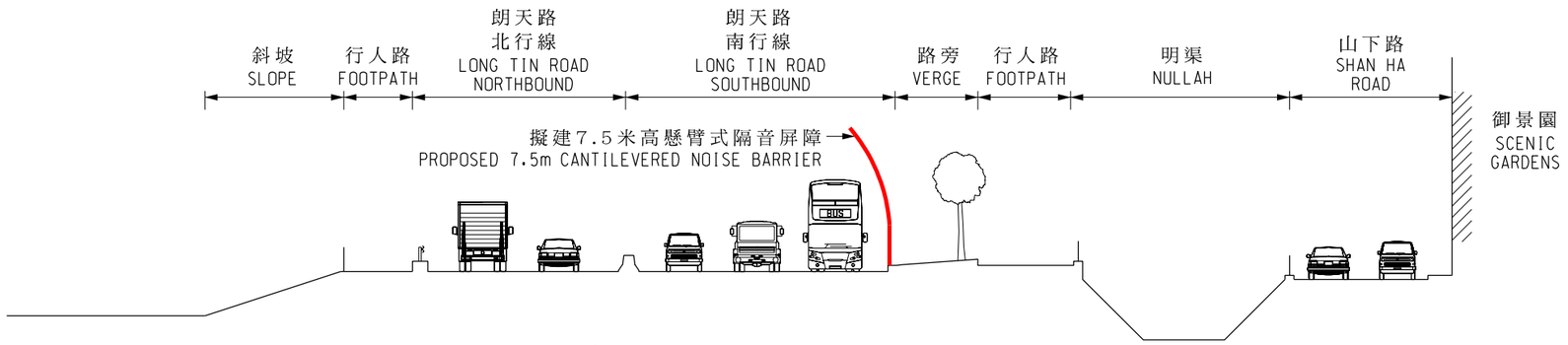
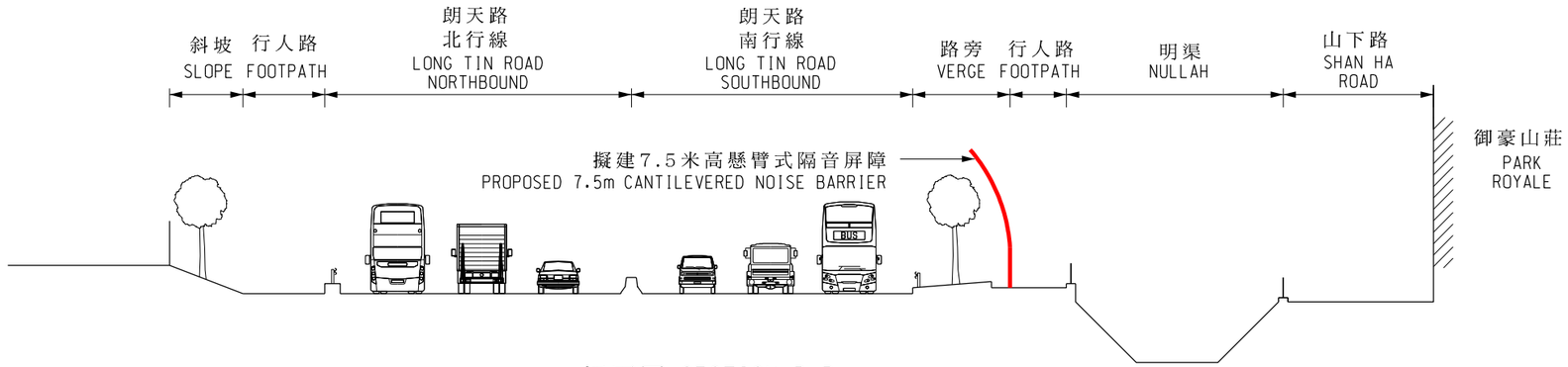
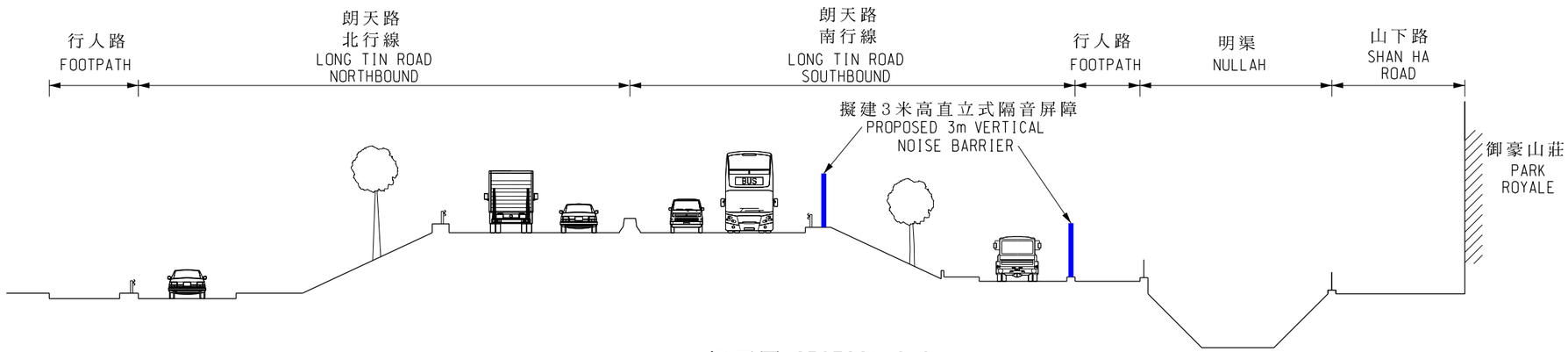
A3 420 x 297



切面圖 SECTION A-A



切面圖 SECTION B-B



切面圖 SECTION C-C

圖則名稱 drawing title

工務計劃項目第832TH號 - 朗天路加建隔音屏障工程 - 切面圖
PUBLIC WORKS PROGRAMME ITEM NO. 832TH - RETROFITTING OF NOISE BARRIERS ON LONG TIN ROAD - SECTIONS

圖則編號 drawing no.
HMW6832TH-SK0028

比例 scale
示意圖
DIAGRAMMATIC

HIGHWAYS DEPARTMENT HONG KONG 路政署 香港

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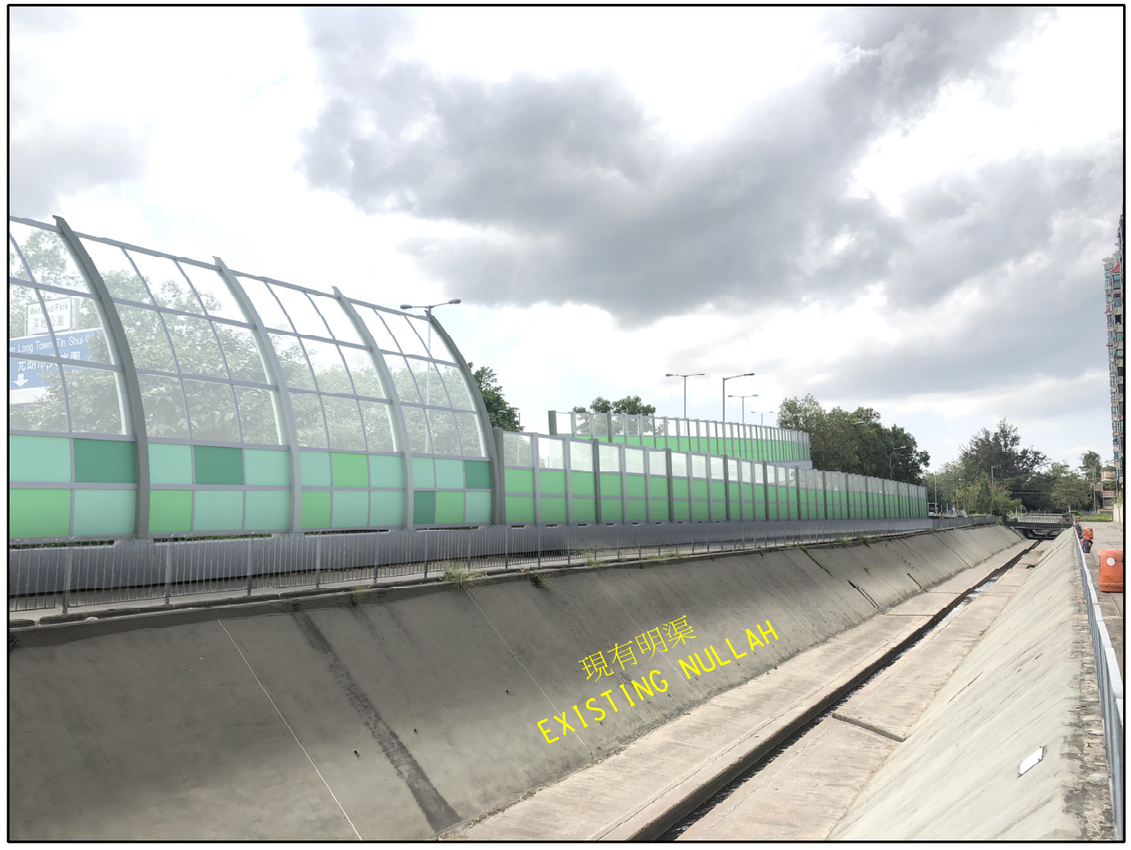
A3 420 x 297

近御豪山莊現況
Near Park Royale Present Situation



近御豪山莊完工後
Near Park Royale Upon Completion of Proposed Works

圖則名稱 drawing title

工務項目計劃第832TH號 - 朗天路加建隔音屏障工程 - 工程的外觀構思圖（三張圖中的第一張）
PUBLIC WORKS PROGRAMME ITEM NO. 832TH - RETROFITTING OF NOISE BARRIERS ON LONG TIN ROAD - ARTIST'S IMPRESSION OF PROPOSED WORKS (SHEET 1 OF 3)

圖則編號 drawing no. HMW6832TH-SK0029

比例 scale 示意圖 DIAGRAMMATIC

HIGHWAYS DEPARTMENT HONG KONG 香港 路政署

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近御景園現況
Near Scenic Gardens Present Situation

近御景園完工後
Near Scenic Gardens Upon Completion of Proposed Works

圖則名稱 drawing title

工務項目計劃第832TH號 - 朗天路加建隔音屏障工程 - 工程的外觀構思圖（三張圖中的第二張）
PUBLIC WORKS PROGRAMME ITEM NO. 832TH - RETROFITTING OF NOISE BARRIERS ON LONG TIN ROAD
- ARTIST'S IMPRESSION OF PROPOSED WORKS (SHEET 2 OF 3)

圖則編號 drawing no. HMW6832TH-SK0030

比例 scale 示意圖 DIAGRAMMATIC

HIGHWAYS DEPARTMENT HONG KONG 香港 路政署

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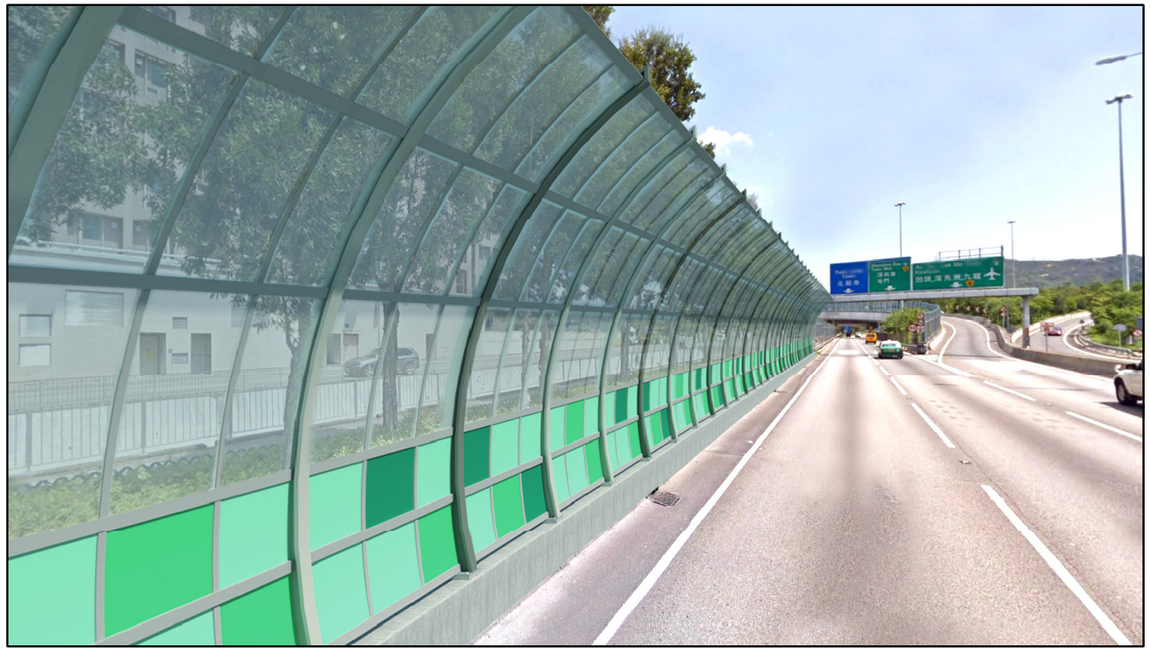
近柏麗豪園現況
Near Parkside Villa Present Situation



近柏麗豪園完工後
Near Parkside Villa Upon Completion of Proposed Works

圖則名稱 drawing title

工務項目計劃第832TH號 - 朗天路加建隔音屏障工程 - 工程的外觀構思圖（三張圖中的第三張）
PUBLIC WORKS PROGRAMME ITEM NO. 832TH - RETROFITTING OF NOISE BARRIERS ON LONG TIN ROAD
- ARTIST'S IMPRESSION OF PROPOSED WORKS (SHEET 3 OF 3)

圖則編號 drawing no. HMW6832TH-SK0031

比例 scale 示意圖 DIAGRAMMATIC

HIGHWAYS DEPARTMENT HONG KONG 香港 路政署

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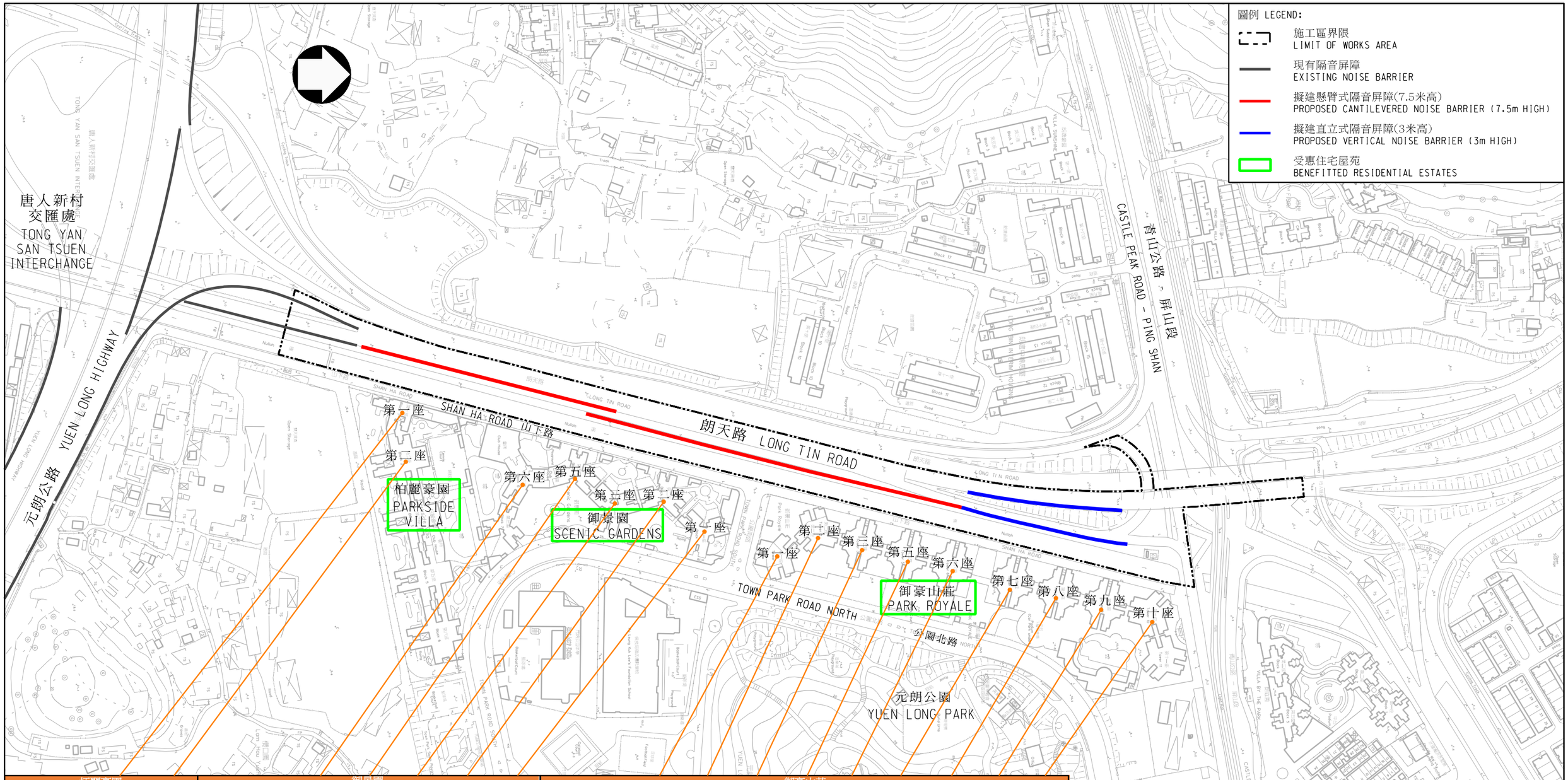
832TH – Retrofitting of noise barriers on Long Tin Road

Breakdown of the number of benefitted dwellings by the respective level of reduction in traffic noise

Reduction in Traffic Noise (dB(A))	Number of Dwellings
10 - 13	36
7 - 9	40
4 – 6	91
1 – 3	273
Total	**440**

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

Traffic Noise Level (dB(A))	Number of Dwellings	
	Before Implementation of the Proposed Mitigation Measures	After Implementation of the Proposed Mitigation Measures
77	71	0
75 – 76	186	129
73 – 74	251	103
71 – 72	37	141
70 or below	N/A	172
Total	**545**	**545**



柏麗豪園		
受惠住宅單位的數目		
受惠單位座數 / 交通及樓層 / 噪音降低值(分貝(A))	第一座 (1/F-11/F)	第二座 (9/F-11/F)
10 - 13	0	0
7 - 9	1	1
4 - 6	2	3
1 - 3	13	0
總數	16	4

御景園					
受惠住宅單位的數目					
受惠單位座數 / 交通及樓層 / 噪音降低值(分貝(A))	第六座 (3/F-16/F)	第五座 (2/F-16/F)	第三座 (5/F-16/F)	第二座 (2/F-16/F)	第一座 (3/F-16/F)
10 - 13	9	7	4	6	1
7 - 9	6	4	4	3	2
4 - 6	7	10	4	8	4
1 - 3	9	24	8	23	23
總數	31	45	20	40	30

御豪山莊									
受惠住宅單位的數目									
受惠單位座數 / 交通及樓層 / 噪音降低值(分貝(A))	第一座 (2/F-11/F)	第二座 (1/F-11/F)	第三座 (1/F-12/F)	第五座 (1/F-12/F)	第六座 (1/F-12/F)	第七座 (1/F-11/F)	第八座 (1/F-10/F)	第九座 (1/F-9/F)	第十座 (1/F-7/F)
10 - 13	0	3	3	2	1	0	0	0	0
7 - 9	0	5	6	3	2	1	2	0	0
4 - 6	3	7	6	9	7	9	8	4	0
1 - 3	15	22	26	25	24	20	18	16	7
總數	18	37	41	39	34	30	28	20	7

圖則名稱 drawing title

工務計劃項目第832TH號 - 朗天路加建隔音屏障工程 - 受惠住宅單位的位置圖

PUBLIC WORKS PROGRAMME ITEM NO. 832TH - RETROFITTING OF NOISE BARRIERS ON LONG TIN ROAD - THE LOCATION MAP OF THE BENEFITTED DWELLINGS

圖則編號 drawing no.	比例 scale
HMW6832TH-SK0033	1:2500

HIGHWAYS DEPARTMENT HONG KONG 路政署 香港

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A3 420 x 297

832TH – Retrofitting of noise barriers on Long Tin Road

Breakdown of cost estimate for different types of noise barriers

	Cost Estimate ($ million) (in MOD prices)		
Type of Noise Barriers	**Superstructure**	**Foundation**	**Sub-total**
Cantilevered Noise Barrier	56.9	102.4	159.3
Vertical Noise Barrier	11.7	20.9	32.6
Sub-total	**68.6**	**123.3**	
Total			**191.9**

832TH – Retrofitting of noise barriers on Long Tin Road

Breakdown of the estimates for consultants' fees and resident site staff costs (in September 2018 prices)

			Estimated man-months	Average MPS* salary point	Multiplier (Note1)	Estimated fee ($ million)
(a)	Consultants' fees for contract administration (Note 2)	Professional	–	–	–	0.7
		Technical	–	–	–	0.1
					Sub-total	0.8#
(b)	Resident site staff (RSS) costs (Note 3)	Professional	113	38	1.6	14.8
		Technical	354	14	1.6	16.3
					Sub-total	31.1
	Comprising –					
	(i) Consultants' fees for management of RSS				2.8#	
	(ii) Remuneration of resident site staff				28.3#	
					Total	**31.9**

*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 = $81,975 per month and MPS point 14 = $28,725 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 **832TH**. The construction phase of the assignment in respect of works will only be executed subject to FC's approval to upgrade **832TH** 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 Enclosure 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 8 of the main paper.