

ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

HEAD 706 – HIGHWAYS

Transport – Roads

798TH – Improvement to Pok Oi Interchange

Members are invited to recommend to Finance Committee the upgrading of **798TH** to Category A at an estimated cost of \$264.8 million in money-of-the-day prices for the improvement to Pok Oi Interchange.

PROBLEM

We need to improve the traffic capacity of Pok Oi Interchange to relieve the existing traffic pressure and meet the future traffic demand.

PROPOSAL

2. The Director of Highways, with the support of the Secretary for Transport and Housing, proposes to upgrade **798TH** to Category A at an estimated cost of \$264.8 million in money-of-the-day (MOD) prices for the improvement to Pok Oi Interchange.

/PROJECT

PROJECT SCOPE AND NATURE

3. The scope of works under **798TH** comprises –
- (a) construction of a single lane flyover of about 150 metres (m) long adjacent to the northbound carriageway of Pok Oi Flyover and associated slip roads of about 590 m long in total connecting with the ground level sections of Yuen Long Highway (YLH);
 - (b) construction of a slip road of about 400 m long connecting the southbound carriageway of Pok Oi Flyover to the ground level section of YLH;
 - (c) widening of about 400 m long of northbound and 140 m long of southbound existing carriageways of YLH north of Pok Oi Roundabout (the Roundabout) by about 1 m;
 - (d) construction of a segregated left-turn lane of about 110 m long at the northern approach road (southbound) of the Roundabout;
 - (e) extension of an existing subway underneath the segregated left-turn lane in (d) above;
 - (f) installation of vertical noise barriers of about 200 m long and 2.5 m high along the southern approach road (northbound) of the Roundabout and reprovisioning of existing noise barriers of about 30 m long and 3 m high along the northern approach road (southbound) of the Roundabout; and
 - (g) associated road, slope, landscaping, drainage, traffic aids and road lighting works.

Site plans and sectional plan of the proposed improvement works as well as an artist's impression showing the proposed flyover are at Enclosure 1.

4. We have substantially completed the detailed design of the proposed works. Subject to funding approval by the Finance Committee, we plan to commence the construction works in the third quarter of 2012 for completion in mid 2015.

/ **JUSTIFICATION**

JUSTIFICATION

5. The existing Pok Oi Interchange is a three-level interchange comprising the east-west at-grade Castle Peak Road (Yuen Long Section) at the bottom, which mainly links the traffic between Au Tau and Yuen Long Town Centre; the north-south YLH, in the form of a flyover (the Pok Oi Flyover) on the top, which mainly links the traffic between Tuen Mun or Tin Shui Wai and Kowloon or Sheung Shui; and an elevated roundabout in the middle, i.e. the Roundabout, which connects with Castle Peak Road (Yuen Long Section) and YLH and mainly links the traffic heading for Kowloon, Sheung Shui, Au Tau, Yuen Long South and Yuen Long Town Centre.

6. Traffic in the northwest of New Territories travelling to and from various destinations has to route through the Roundabout. At present, traffic from Yuen Long South heading for Kowloon (via Shap Pat Heung Roundabout then Tai Lam Tunnel) or Sheung Shui (via San Tin Highway); or traffic from the southbound carriageway of YLH located at the north of the Roundabout, heading for Au Tau, Yuen Long South or Yuen Long Town Centre, has to route through the Roundabout. Under such traffic arrangements, the Roundabout now operates beyond its capacity at a design flow/capacity (DFC) ratio¹ of 1.05, resulting in congestion. At peak hours, long traffic queues of about 1 kilometre (km) and 0.5 km are observed at the southbound approach road and northbound approach road of the Roundabout respectively. Traffic on these approach roads has to move at a crawling speed of 10 to 15 km per hour. If there were no traffic congestion, traffic could proceed at a speed of 50 km per hour on these approach roads. These long traffic queues often tail back to the mainlines of YLH resulting in obstruction to the through traffic. For example, it takes about 6 minutes for traffic on the southbound carriageway of YLH (via the Roundabout) heading for Yuen Long Town Centre or Shap Pat Heung Roundabout to route through the 1 km long traffic queue at peak hours. However, when no traffic queue occurs, it only takes less than 1 minute for the traffic to route through the same road section with a saving of about 5 minutes for the journey.

/ 7.

¹ Design flow/capacity (DFC) ratio is a design parameter which measures the degree of saturation of traffic at a priority junction. A DFC ratio above 1 indicates the presence of traffic queues. A DFC ratio of 0.85 is generally used in junction design which indicates a desirable traffic flow condition.

7. Furthermore, with the future development of Yuen Long Town, it is anticipated that the traffic congestion problem at the Roundabout will be further aggravated. If the proposed improvement works cannot be implemented in a timely manner, the congestion problem will become more serious as the DFC ratio of the Roundabout rises to 1.38 in 2016 and further soars to 1.45 in 2021. By then, the traffic queue at the northern approach road will exceed 1.5 km. Prolonged delay to the motorists routing through the Roundabout will be inevitable. Taking the same example of vehicles from the southbound carriageway of YLH (via the Roundabout), it will take about 9 minutes to route through the 1.5 km long traffic queue by then.

8. Upon completion of the proposed improvement works in mid 2015, traffic from Sheung Shui (via San Tin Highway) and Kowloon (via Tai Lam Tunnel) heading for Yuen Long South and traffic from Yuen Long South heading for Sheung Shui and Kowloon (via Tai Lam Tunnel) can bypass the Roundabout using the new southbound and northbound slip roads respectively. With a reduction in the number of vehicles using the Roundabout, persistent traffic queues at both northern and southern approach roads of the Roundabout will no longer occur, thereby shortening the journey time for traffic to route through the Roundabout by as much as 8 minutes and lowering the DFC ratio of the Roundabout to a desirable level of 0.85. At the same time, the proposed improvement works will also provide sufficient reserve capacity for the Roundabout to cope with the anticipated traffic growth in the area.

FINANCIAL IMPLICATIONS

9. We estimate the cost of the project to be \$264.8 million in MOD prices (please see paragraph 10 below), broken down as follows –

	\$ million
(a) Flyover	106.8
(I) foundation	76.6
(II) superstructure	30.2
(b) Slip roads and carriageway widening	52.8
(c) Segregated left-turn lane	11.2
(d) Subway extension	3.2

/ \$ million.....

		\$ million	
(e)	Noise barriers		13.2
	(I) installation of noise barriers along the southern approach road (northbound) of the Roundabout ²	10.6	
	(i) foundation	8.0	
	(ii) noise barrier panels	2.6	
	(II) reprovisioning of existing noise barriers along the northern approach road (southbound) of the Roundabout	2.6	
	(i) foundation	2.1	
	(ii) noise barrier panels	0.5	
(f)	Associated road, slope, landscaping, drainage, traffic aids and road lighting works		12.7
(g)	Environmental mitigation measures		1.9
(h)	Consultants' fees		2.3
	(I) advisory services for contract administration	1.3	
	(II) Environmental Monitoring and Audit (EM&A) programme	1.0	
(i)	Contingencies		<u>19.5</u>
	Sub-total		223.6 (in September 2011 prices)
(j)	Provision for price adjustment		<u>41.2</u>
	Total		<u>264.8</u> (in MOD prices)

We plan to engage consultants to provide advisory services for contract administration and to implement the EM&A programme for the project. A breakdown of the consultants' fees based on the estimated man-months is at Enclosure 2.

/ 10.

² According to the conditions of the Environmental Permit issued by Environmental Protection Department for this project, this section of noise barriers needs to be completed before the commissioning of two nearby schools in planning. As there is no firm programme for the construction of these schools, we will complete the foundation of the noise barriers first, and then install the noise barrier panels to suit Education Bureau's programme for building the schools in due course.

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

Year	\$ million (in Sep 2011 prices)	Price adjustment factor	\$ million (in MOD prices)
2012 – 2013	9.6	1.05375	10.1
2013 – 2014	71.3	1.11171	79.3
2014 – 2015	68.4	1.17285	80.2
2015 – 2016	36.6	1.23736	45.3
2016 – 2017	27.9	1.30541	36.4
2017 – 2018	9.8	1.37721	13.5
	<u>223.6</u>		<u>264.8</u>

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 for public sector building and construction output from 2012 to 2018. We will tender the proposed works under a target cost contract³ with provision for price adjustments.

12. We estimate the additional annual recurrent expenditure of the proposed works to be \$1 million.

PUBLIC CONSULTATION

13. We consulted the Shap Pat Heung Rural Committee and the Traffic and Transport Committee (T&TC) of the Yuen Long District Council on the project on 7 September 2007 and 21 September 2007 respectively. Members of both Committees supported the proposal.

/14.

³ We will adopt a target cost contract approach in implementing the proposed works. Target cost contract means that the contractor will tender for a target price. The contractor will share the cost savings if the actual cost of works is below the target price or the cost in excess if the actual cost of works is above the target price according to a pre-determined share percentage with the Government. The Government's share of the cost in excess is capped at 10% above the target price.

14. We gazetted the proposed works under the Roads (Works, Use and Compensation) Ordinance (Cap. 370) (the Ordinance) on 22 May 2009. During the statutory objection period, we received two objections of which the details are at Enclosure 3. Despite the Administration's explanations, both objectors did not withdraw the objections and the objections are treated as unresolved objections⁴. Having considered the unresolved objections, the Chief Executive-in-Council authorised the proposed works on 4 May 2010 without modifications under the Ordinance. The notice of authorisation was gazetted on 28 May 2010. Members of the T&TC of Yuen Long District Council urged for early implementation of the project at its meetings held on 30 September 2010 and 20 July 2011.

15. We consulted the Legislative Council Panel on Transport on 5 January 2012. Members supported the implementation of the project. At the meeting, members expressed views on the timetable for the installation of vertical noise barriers of about 200 m long and 2.5 m high along the southern approach road (northbound) of the Roundabout. We concur with Members' views and will complete the foundation of the noise barriers first, followed by the installation of the noise barrier panels before the commissioning of the nearby schools in planning according to the conditions of the Environmental Permit as issued by Environmental Protection Department for this project.

16. We consulted the Advisory Committee on the Appearance of Bridges and Associated Structures⁵ on the aesthetic design of the proposed flyover. The Committee accepted the proposed aesthetic design on 16 June 2009. The relevant artist's impression is at Enclosure 1.

/ **ENVIRONMENTAL**

⁴ Under the Ordinance, an objection which is not withdrawn or withdrawn with conditions is treated as an unresolved objection and will be submitted to the Chief Executive-in-Council for consideration.

⁵ The Advisory Committee on the Appearance of Bridges and Associated Structures, which comprises representatives of the Hong Kong Institute of Architects, Hong Kong Institution of Engineers, 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.

ENVIRONMENTAL IMPLICATIONS

17. The project is a designated project under Schedule 2 of the Environmental Impact Assessment Ordinance (Cap. 499) (EIAO) and an environmental permit is required for the construction and operation of the project. In March 2009, the Environmental Impact Assessment (EIA) report for the project was approved under the EIAO. The EIA report concluded that the environmental impact of the project can be controlled to within the criteria under EIAO and the Technical Memorandum on EIA Process. We shall implement the measures recommended in the approved EIA report. The key measures include provision of noise barriers for nearby schools in planning, provision of temporary movable noise screens at works locations and frequent cleaning and watering of the site, etc. during construction. We estimate the cost of implementing the environmental mitigation measures, noise barriers works and an EM&A programme to be \$16.1 million. We have included this cost in the overall project estimate.

18. At the planning and design stages, we have considered measures to reduce the generation of construction waste where possible and to manage the waste. We will implement measures to reduce the generation of construction waste. Such measures include adopting retaining walls to minimise cutting of existing slopes in order to reduce the quantity of construction waste from excavation. In addition, we will require the contractor to reuse inert construction waste (e.g. excavated materials for backfilling) 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 facilities⁶. We will encourage the contractor to maximise the use of recycled or recyclable inert construction waste and non-timber formwork to further reduce the generation of construction waste.

19. 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.

/ 20.

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 in public fill reception facilities requires a license issued by the Director of Civil Engineering and Development.

20. We estimate that the project will generate in total about 43 000 tonnes of construction waste. Of these, we will reuse about 18 000 tonnes (41.9%) of inert construction waste on site and deliver 21 000 tonnes (48.8%) of inert construction waste to public fill reception facilities for subsequent reuse. We will dispose of the remaining 4 000 tonnes (9.3%) of non-inert construction waste at landfills. The total cost for accommodating construction waste at public fill reception facilities and landfill sites is estimated to be about \$1.07 million for this project (based on a unit cost of \$27 per tonne for disposal at public fill reception facilities and \$125 per tonne⁷ at landfills).

TRAFFIC IMPLICATIONS

21. We have conducted a traffic impact assessment (TIA) for the proposed works including assessment of the impact on traffic during the construction stage. The TIA concluded that the proposed works would not cause any significant traffic impact to the surrounding road network with implementation of appropriate temporary traffic arrangements (including maintaining the number of existing traffic lanes of the Roundabout and YLH unchanged at peak hours). We will specify such requirements for implementing the temporary traffic arrangements in the works contract to minimise the impact on traffic during the construction stage. We will also display publicity boards on site, giving details of the temporary traffic arrangements and the anticipated completion dates of individual sections of works. In addition, we will set up a telephone hotline for public enquiries or complaints.

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**

⁷ 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 per m³), nor the cost to provide new landfills (which is likely to be more expensive) when the existing ones are filled.

LAND ACQUISITION

23. No private land will be resumed for the project. Though no structure will need to be cleared, clearance of crops, fruit trees, flowers and fences within Government lands will be required. Ex-gratia allowance will be granted to the affected cultivators, if any, in line with the established policy. We will also consider granting relevant ex-gratia allowance, such as that for “Tun Fu” ceremonies, where appropriate. The total land acquisition cost for the project is estimated to be \$132,000. It will be charged to **Head 701 – Land Acquisition**. A breakdown of the land acquisition cost is at Enclosure 4.

BACKGROUND INFORMATION

24. We upgraded **798TH** to Category B in November 2005. We have charged a total cost of about \$4.3 million to block allocation **Subhead 6100TX** “Highways works, studies and investigations for items in Category D of the Public Works Programme” for the ground investigation work, TIA study and EIA study. We completed the ground investigation works, TIA study and EIA study in September 2006, October 2007 and March 2009 respectively.

25. The proposed works will involve removal of 417 trees, including 395 trees to be felled and 22 trees to be transplanted within the project site. All trees to be removed are not important trees⁸. We will incorporate planting proposal as part of the project, including of the planting of about 444 trees and 72 600 shrubs which will produce about 5 700 square metres of planting area in total.

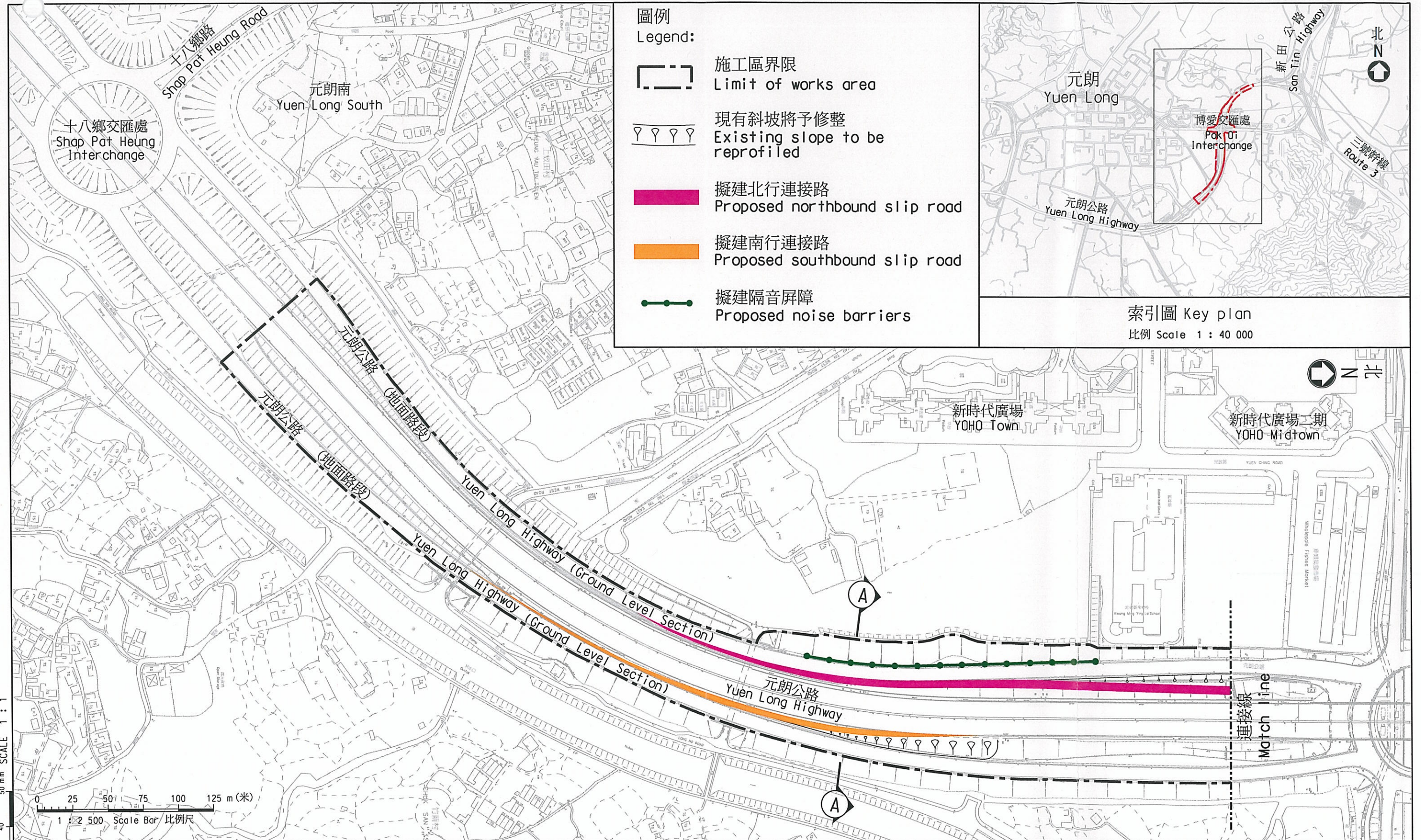
/26.

⁸ “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 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 important persons 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 certain like aerial roots, trees growing in unusual habitat; or
- (e) trees with trunk diameter equal or exceeding 1.0 metre (m) (measured at 1.3m above ground level), or with height/canopy spread equal or exceeding 25m.

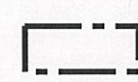
26. We estimate that the proposed works will create 127 jobs (18 for professional/technical staff and 109 for labourers), providing a total employment of 3 420 man-months.

Transport and Housing Bureau
January 2012

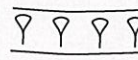


圖例

Legend:



施工區界限
Limit of works area



現有斜坡將予修整
Existing slope to be reprofiled



擬建北行連接路
Proposed northbound slip road



擬建南行連接路
Proposed southbound slip road



擬建隔音屏障
Proposed noise barriers

索引圖 Key plan

比例 Scale 1 : 40 000

圖則名稱 drawing title

工務計劃項目第798TH號
博愛交匯處改善工程 - 工地圖

PWP Item No. 798TH
Improvement to Pok Oi Interchange - Site Plan

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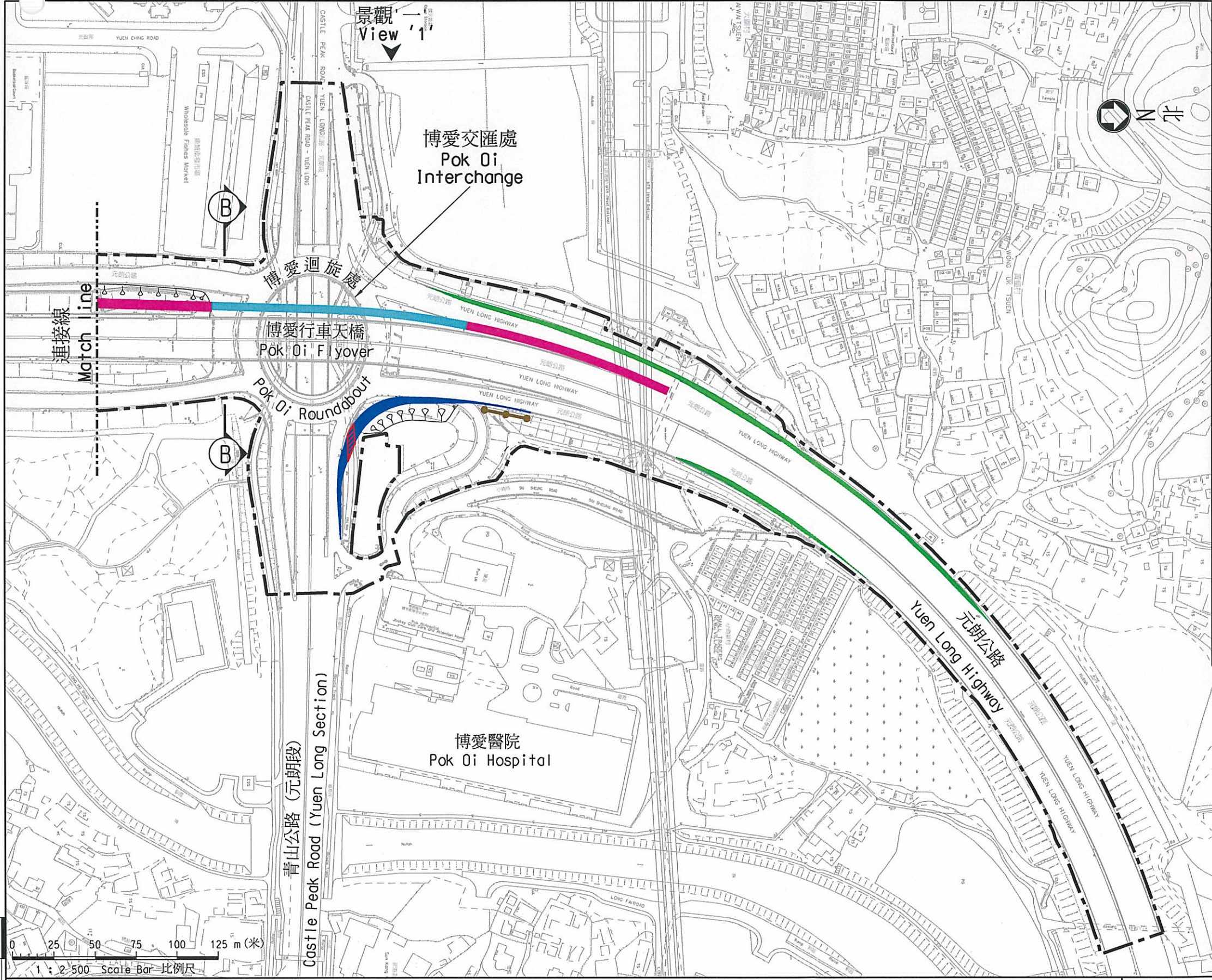
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HWDYL051A-SP0002




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
圖例
Legend:


 施工區界限
Limit of works area

現有斜坡將予修整
Existing slope to be reprofiled

 擬建行車天橋
Proposed flyover


 擬建北行連接路
Proposed northbound slip road

 擬擴闊的行車道
Proposed carriageway widening


 擬建分隔左轉線
 Proposed segregated left-turn lane



擬建行人隧道伸延段
Proposed subway extension


 現有隔音屏障將予後移及重置
Existing noise barriers to be setback and re-provisioned

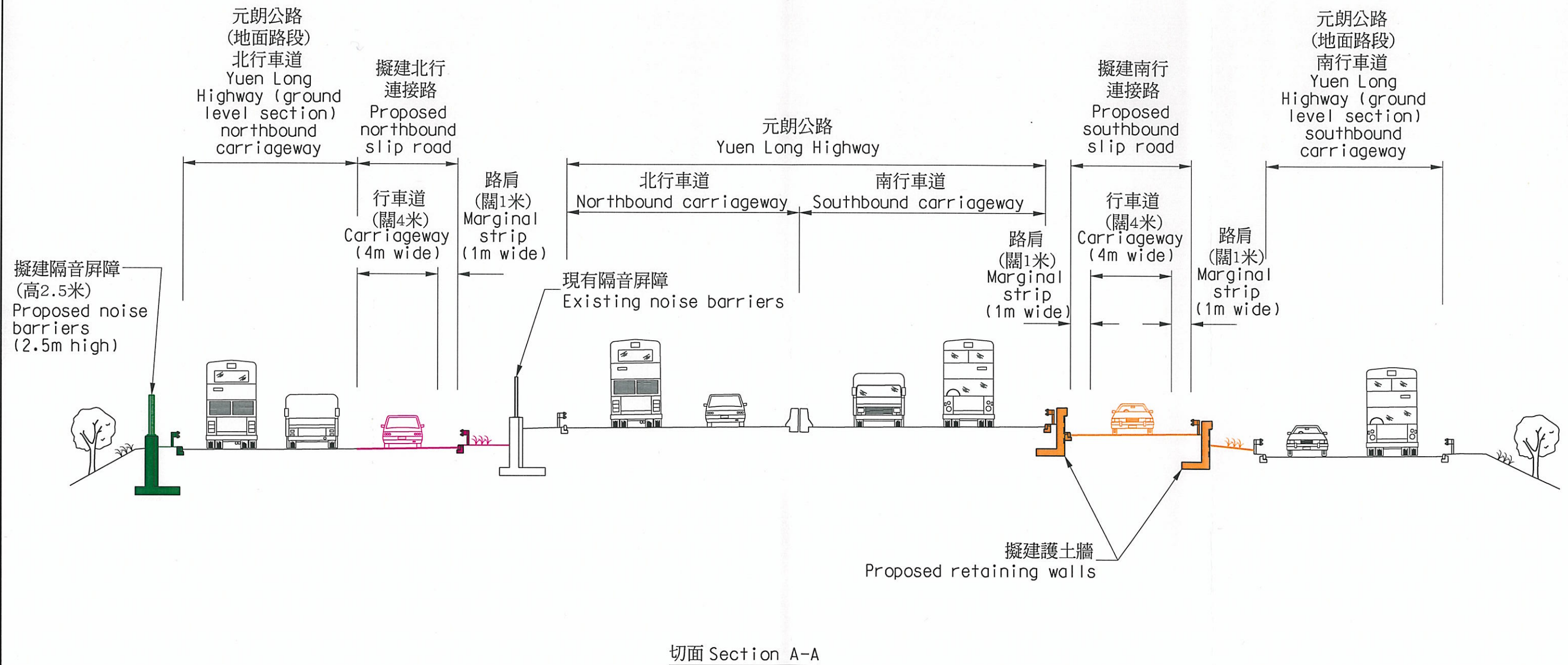
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圖則名稱 drawing title

工務計劃項目第798TH號
博愛交匯處改善工程 - 工地圖

PWP Item No. 798TH
Improvement to Pok Oi Interchange - Site Plan

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圖則名稱 drawing title

工務計劃項目第798TH號
博愛交匯處改善工程 - 切面圖

PWP Item No. 798TH
Improvement to Pok Oi Interchange - Sectional Plan

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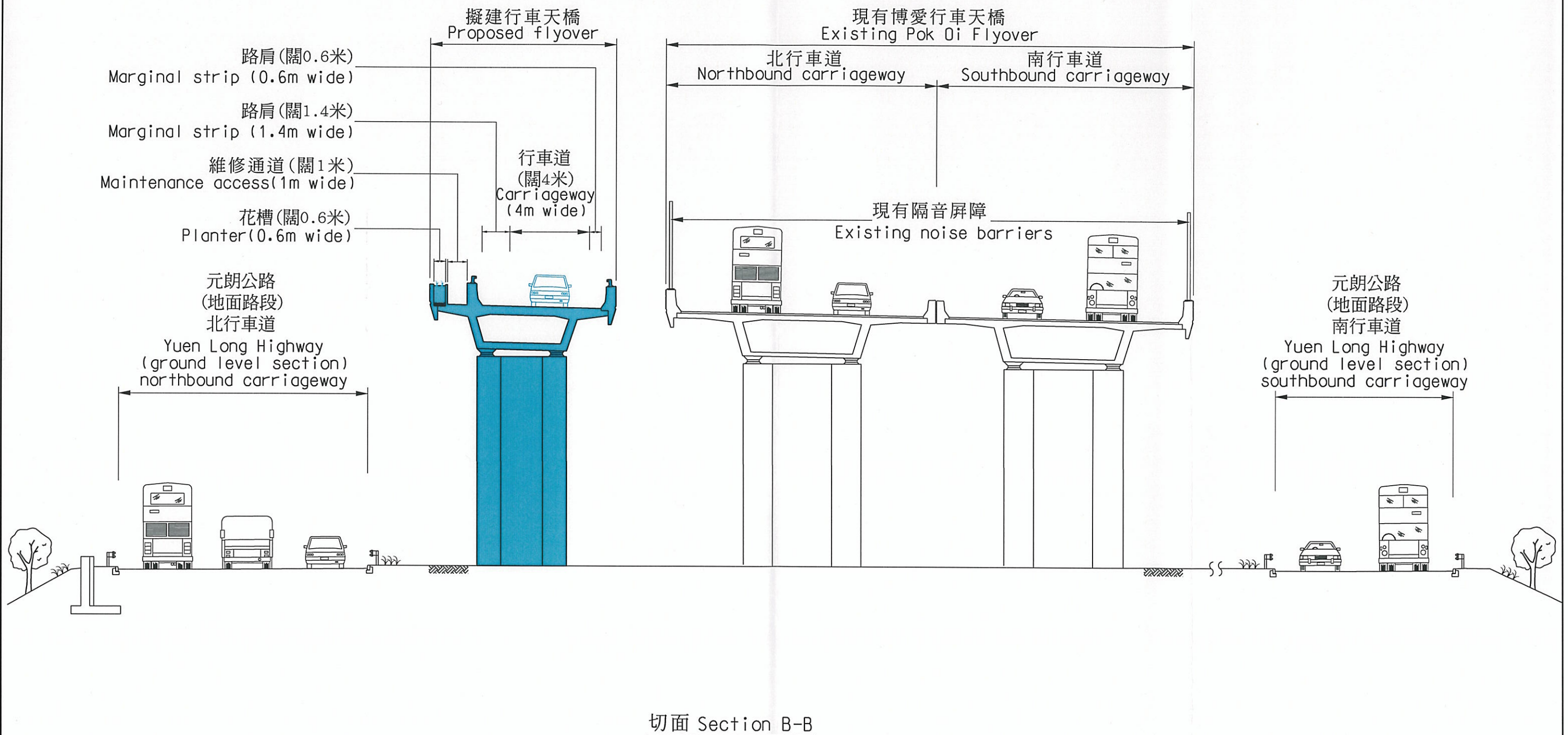
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工務計劃項目第798TH號
博愛交匯處改善工程 - 擬建行車天橋的構思圖

PWP Item No. 798TH
Improvement to Pok Oi Interchange - Artist's Impression of Proposed Flyover

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示意圖
Diagrammatic

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798TH – Improvement to Pok Oi Interchange**Breakdown of estimates for consultants' fees (in September 2011 prices)**

			Estimated man- months	Average MPS* salary point	Multiplier (Note)	Estimated fees (\$million)
(a)	Consultants' fees for contract administration advisory services ¹	Professional	10.0	38	2.0	1.2
		Technical	2.0	14	2.0	0.1
						<hr/>
					Sub-total	1.3
(b)	Consultants' fees for EM&A programme	Professional	5.0	38	2.0	0.6
		Technical	10.0	14	2.0	0.4
						<hr/>
					Sub-total	1.0
						<hr/>
					Total	2.3

* MPS = Master Pay Scale

Note:

A multiplier of 2.0 is applied to the average MPS salary point to arrive at the full staff costs including the consultants' overheads and profit, as the staff will be employed in the consultants' offices. (At present, MPS salary point 38 = \$62,410 per month and MPS salary point 14 = \$21,175 per month).

¹ We will adopt a target cost contract approach in implementing the proposed works. Target cost contract means that the contractor will tender for a target price. The contractor will share the cost savings if the actual cost of works is below the target price or the cost in excess if the actual cost of works is above the target price according to a pre-determined share percentage with the Government. The Government's share of the cost in excess is capped at 10% above the target price. Highways Department will deploy in-house staff to supervise the construction of the proposed works. The fees in (a) above will be used for engaging consultants to provide professional advisory services for Highways Department's detailed arrangements for contract administration.

**798TH – Improvement to Pok Oi Interchange
Objections lodged under Roads (Works, Use and Compensation) Ordinance
(Cap. 370)**

During the statutory objection period, we received two objections of which both remained unresolved. Details of the objections are as follows –

2. Objector No. 1 requested that an additional noise barrier of 2.5 metres (m) high should be provided on top of a 1.1 m high concrete parapet wall along the nearside of the proposed flyover to minimize noise impact to the nearby residents. We explained to the objector that it had been revealed in the environmental impact assessment (EIA) study under the EIA Ordinance that the provision of a 1.1m high concrete parapet wall along the nearside of the proposed flyover and slip roads would be adequate to mitigate the traffic noise due to the project to an acceptable level.

3. Objector No. 2 was concerned that the project would likely increase the traffic burden of the local roads in Yuen Long. She also expressed concern over the problem of vehicle speeding near Shap Pat Heung Road. We explained to the objector that the project itself would not bring about additional traffic to the concerned local roads as revealed in the traffic impact assessment (TIA) study conducted. Nevertheless, Transport Department has agreed to review the traffic conditions of the concerned local roads and implement appropriate traffic improvement schemes as and when necessary. The Hong Kong Police Force has also agreed to take stringent enforcement and control actions against vehicle speeding.

4. Both objectors maintained the objections upon completion of the resolution process. Hence, the objections are treated as unresolved objections.

798TH – Improvement to Pok Oi Interchange

Breakdown of land acquisition cost

		\$
(a)	Ex-gratia allowance of crop compensation	75,000
(b)	Ex-gratia allowance for farm structures and miscellaneous permanent improvements to farm fence	5,000
(c)	Ex-gratia allowance for miscellaneous indigenous villager matters, such as expenses for “Tun Fu” ceremonies	40,000
		<hr/>
	Sub-total	120,000
(d)	Contingencies	12,000
		<hr/>
	Total	132,000