

ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

HEAD 706 – HIGHWAYS

Transport – Roads

746TH – Reconstruction and improvement of Tuen Mun Road

Members are invited to recommend to Finance Committee the upgrading of **746TH** to Category A at an estimated cost of \$4,620.5 million in money-of-the-day prices for the reconstruction and improvement of Tuen Mun Road.

PROBLEM

Tuen Mun Road (TMR) was designed and built in the 1970s. Most at-grade sections of TMR have already reached the end of their service life and are now in a state beyond economical repair. It is necessary to upgrade TMR to the current design standards as far as practicable.

PROPOSAL

2. The Director of Highways, with the support of the Secretary for Transport and Housing and Secretary for the Environment, proposes to upgrade **746TH** to Category A at an estimated cost of \$4,620.5 million in money-of-the-day (MOD) prices for the reconstruction and improvement of the section of TMR from Tsuen Wan to Sam Shing Hui in Tuen Mun.

/PROJECT

PROJECT SCOPE AND NATURE

3. The scope of works for **746TH** comprises –
- (a) reconstruction of about 13.4 kilometres (km) at-grade sections of TMR and resurfacing of about 2.1 km of TMR on highway structures between Tsuen Wan and Sam Shing Hui;
 - (b) improvement of the road design of TMR according to the current expressway standards as far as practicable, including the widening of traffic lanes, provision of hard shoulders 3.65 metres (m) wide and improvement of sightlines, gradients, road curvature, super elevation, etc.;
 - (c) modification of highway structures including viaducts, bridges, box culverts, underpasses, footbridges, subways, as well as demolition and reprovision of a footbridge;
 - (d) lengthening of the merging/diverging lanes at the interchanges at Sham Tseng and Siu Lam, and the exit ramp from Tsing Long Highway to westbound TMR;
 - (e) replacement of barriers at the central median along the at-grade road by concrete profile barriers and reprovisioning of barriers along the edge of the at-grade road and the edge parapets of bridges and viaducts to current standards;
 - (f) upgrading works to roadside slopes;
 - (g) installation along TMR of –
 - (i) a semi-enclosure about 520 m long and 9 m high at Castle Peak Bay;

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- (ii) cantilevered noise barriers about 180 m long and 5.6 m high and 740 m long and 7.6 m high at Tsing Lung Tau¹;
- (iii) cantilevered noise barriers about 260 m long and 8.3 m high and vertical noise barriers about 605 m long and 2 m high at Anglers' Beach;
- (iv) a semi-enclosure about 225 m long and 9 m high; cantilevered noise barriers about 355 m long and 8.3 m high and vertical noise barriers about 60 m long and 1.5 m high at Sham Tseng;
- (v) cantilevered noise barriers about 480 m long and 8 m high and vertical noise barriers about 520 m long and 4 m high at Yau Kom Tau;
- (vi) a semi-enclosure about 130 m long and 5.5 m high and cantilevered noise barriers about 2 060 m long and 8 m high at Tsuen Wan;

and implementation of the associated environmental monitoring and audit (EM&A) programme;

- (h) upgrading of the traffic control and surveillance system (TCSS);
- (i) installation of fire fighting system; and
- (j) associated civil, structural, landscaping works and works on environmental mitigation, drainage, road lightings, water mains and traffic aids.

A plan showing the proposed works is at Enclosure 1.

4. We plan to commence construction in May 2008 for completion in phases by April 2014.

/JUSTIFICATION

¹ The proposed noise barriers at Tsing Lung Tau, which encompass the scope of works under Public Works Programme Item No. **6786TH** "Retrofitting of noise barriers on Tuen Mun Road at Tsing Lung Tau", have been subsumed under PWP Item **746TH**. We upgraded PWP Item **6786TH** to Category B in October 2004.

JUSTIFICATION

5. The existing section of TMR between Tsuen Wan and Sam Shing Hui is a dual three-lane carriageway about 15.5 km long. It comprises about 13.4 km at-grade roads and 2.1 km bridge structures. The road has been in service for more than 25 years. Most of its at-grade sections have already reached the end of their service life² and are now beyond economical repair.

6. The annual maintenance cost for every square metre (m²) of TMR is about \$43, which is about 22% higher than that for both the adjacent Yuen Long Highway and San Tin Highway. In the past three years from April 2004 to March 2007, TMR had experienced an average of 407 lane closures per annum for road resurfacing works. This frequency is disproportionately higher than the 164 and 93 lane closures per annum for Yuen Long Highway (8.5 km long) and San Tin Highway (6.6 km long) respectively. This significantly affects the smooth operation of TMR. It is expected that the situation will become worse with the continued aging of the road. It is necessary to reconstruct the at-grade sections of TMR in order to reduce the frequency of repairing and the resulting traffic disruptions.

7. TMR was built according to the design standards over 25 years ago. Its design is not completely in line with current expressway standards. While the safety of motorists is assured³, it is necessary to upgrade TMR to the current expressway standards as far as practicable in order to improve the traffic flow and further enhance road safety. The reconstruction programme will include the widening of lanes, provision of hard shoulders, improvement of sightlines, gradients, road curvature, super elevation, etc.

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² The design service life of at-grade road pavement is 20 years while that for highway bridge structures is 120 years.

³ The Report on Enhancement of Highway Safety issued by the Independent Expert Panel on Tuen Mun Road Incident in December 2003 stated that -
“Having examined the past accident statistics, the Panel considers that Tuen Mun Road is intrinsically safe as seen by its accident rates, which are about average for all expressways...” (Page vii, para. 20)
“The Panel considers that the marginally lower standards of Tuen Mun Road at a few locations, due to changes in standards over time, mainly affect the comfort of motorists but not their safety...” (Page 118, para. 10.22)

8. The merging/diverging lanes of the existing interchanges at Sham Tseng and Siu Lam and the exit ramp from Tsing Long Highway to westbound TMR, with lengths ranging from 64 m to 90 m, are too short to meet current traffic engineering standards of 89 m to 210 m. It is necessary to lengthen the merging/diverging lanes at these locations to enable motorists to enter and exit TMR more smoothly and safely.

9. In order to construct hard shoulders on both sides of TMR and lengthen the merging/diverging lanes, it is necessary to form space by cutting and filling slopes, constructing retaining walls and widening the existing bridges/viaducts. We will take the opportunity to improve the affected slopes up to current standards.

10. In order to provide better vehicle containment and enhance road safety, we will replace the barriers along the central median of TMR with standard concrete profile barriers. We will also rebuild the barrier/edge parapets, with modifications where necessary, when the edge of the at-grade road and bridge/viaducts are realigned under the project.

11. There are about 300 man-made slopes along TMR. These slopes were mostly constructed together with TMR back in the 1970s. We will take the opportunity to upgrade these roadside man-made slopes along TMR to the current standards and design, as well as implement, necessary mitigation measures for any natural terrain hazards identified.

12. In November 2000, the Administration promulgated a policy to address the noise impact of existing roads on neighbouring residents. Under this policy, direct engineering solutions by way of retrofitting of barriers and enclosures, and resurfacing with low noise material, will be implemented where practicable on existing roads where the noise level exceeds the limit of 70dB(A) L_{10} (1 hour)⁴.

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⁴ L_{10} (1 hour) is the noise level exceeded for 10% of a one-hour period, generally used for road noise at peak traffic flow. The noise limit of 70 dB(A) for residential premises as stipulated in the Hong Kong Planning Standards and Guidelines is adopted as the administrative guideline for retrofitting projects identified under the policy introduced in 2000.

13. At present, about 5 200 dwellings adjacent to TMR at six locations in Tsuen Wan, Yau Kom Tau, Sham Tseng, Anglers' Beach, Tsing Lung Tau and Castle Peak Bay are exposed to excessive traffic noise of up to 84 dB(A) L₁₀(1 hour). In line with the above policy for mitigating traffic noise from existing roads, we will take the opportunity to install noise barriers and semi-enclosures on these road sections in order to reduce the noise impact. The proposed noise barriers and semi-enclosures would lower the existing traffic noise levels on the affected sensitive receivers by 1 to 21 dB(A) L₁₀ (1 hour) benefiting about 4 100 dwellings.

14. The existing TCSS consists of a closed circuit television (CCTV) system and traffic congestion indicators⁵ along TMR. We will take the opportunity to upgrade the TCSS to enhance the efficiency and effectiveness of traffic and incident management. The upgrading works include replacement of the existing cables, addition of eight cameras for the CCTV system, and installation of variable message signs to provide instant traffic information to motorists.

15. We will also take this opportunity to install a fire fighting system to enhance fire fighting ability along TMR in accordance with current standards.

FINANCIAL IMPLICATIONS

16. We estimate the cost of the project to be \$4,620.5 million in MOD prices (see paragraph 17 below), made up as follows –

	\$ million
(a) Roads and drains ⁶	691.0
(b) Earthworks ⁷	629.6
(c) Modifications to highway structures	252.9
(d) Slope upgrading works	714.5
	/\$ million

⁵ A traffic congestion indicator is a message sign advising motorists on traffic condition ahead well before they enter the expressway.

⁶ Item (a) includes road pavements, street furniture, traffic signs, road markings, drainage and temporary traffic arrangement measures.

⁷ Item (b) includes slope cutting, embankment filling and retaining wall construction.

		\$ million	
(e)	Noise mitigation measures	594.0	
	(i) semi-enclosures	280.0	
	(ii) cantilevered noise barriers	286.0	
	(iii) vertical noise barriers	28.0	
(f)	TCSS	244.5	
(g)	Landscaping works	261.4	
(h)	Fire fighting system	105.3	
(i)	Site investigation and structural condition survey ⁸	97.1	
(j)	Consultants' fees	387.9	
	(i) construction supervision and contract administration	14.9	
	(ii) resident site staff cost	371.3	
	(iii) EM&A programme ⁹	1.7	
(k)	Contingencies	395.9	
	Sub-total	4,374.1	(in September 2007 prices)

/\$ million

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Item (i) includes carrying out site investigation works which cannot be done during the detailed design stage due to access difficulties and also a condition survey on the highway structures to be modified under the project.

9

We will engage a consultant to implement an EM&A programme as described in paragraph 3 above at an estimated cost of \$1.7 million for **746TH** to ensure timely and effective implementation of the recommended mitigation measures.

	\$ million
(l) Provision for price adjustment	246.4

Total	4,620.5 (in MOD prices)

_____ A breakdown of the estimated consultants' fees is at Enclosure 2.

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

Year	\$ million (Sep 2007)	Price Adjustment Factor	\$ million (MOD)
2008 – 2009	320.5	1.00750	322.9
2009 – 2010	540.2	1.01758	549.7
2010 – 2011	626.8	1.02775	644.2
2011 – 2012	626.8	1.03803	650.6
2012 – 2013	626.8	1.05619	662.0
2013 – 2014	626.8	1.07732	675.3
2014 – 2015	543.3	1.09886	597.0
2015 – 2016	462.9	1.12084	518.8
	_____		_____
	4,374.1		4,620.5
	_____		_____

18. We have derived the MOD estimate on the basis of the Government's latest forecast of trend rate of change in the prices of public sector building and construction for the period 2008 to 2016. We will tender the proposed works under re-measurement contracts because the quantities of earthworks and foundation of noise barriers and semi-noise enclosures are subject to variation due to actual ground conditions. We will allow for price adjustments in the contracts as the construction periods will exceed 21 months.

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19. We estimate the additional annual recurrent expenditure upon completion of the project to be about \$24.8 million.

PUBLIC CONSULTATION

20. We consulted the Traffic and Transport Committee (T&TC) of the Tuen Mun District Council (TMDC), Tsuen Wan District Council (TWDC) and Yuen Long District Council (YLDC) on 10 November 2006, 28 November 2006 and 14 December 2006 respectively on the proposed reconstruction and improvement of TMR, including the noise barrier schemes. Members of the three district councils generally supported the projects and urged for their early implementation. Some TMDC members requested the provision of a bus-bus interchange (BBI) at Siu Lam and an emergency exit at So Kwun Wat; and enhancement of the traffic flow capacity at Sham Tseng Interchange. We explained to these members that we would examine the feasibility and practicability of their proposals. We are now investigating the provision of the BBI at Siu Lam and improvement to Sam Tseng Interchange as separate projects and have been keeping the TMDC and TWDC informed of the development. As regards the provision of an emergency exit at So Kwun Wat, we found that it is not technically feasible due to operational difficulties.

21. We gazetted the road scheme for the proposed improvement works to TMR under the Roads (Works, Use and Compensation) Ordinance (the Ordinance) (Cap. 370) on 4 May 2007 and received 115 objections. Six of these objections have subsequently been withdrawn unconditionally and 66 withdrawn conditionally¹⁰. The objectors of the remaining 43 objections have maintained their objections or have not indicated their withdrawal. Details of the objections are as follows –

- (a) Two objectors objected to the provision of cantilevered noise barrier fronting only two blocks of Rhine Garden and requested the provision of a semi-enclosure to protect the entire premises. They also requested the Administration to consider the provision of indirect technical remedies in the form of window insulation and air-conditioning if their proposal is found impractical.

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¹⁰ Under the Ordinance, an objection that is withdrawn unconditionally is treated as if the objector had not lodged the objection. An objection which is not withdrawn or withdrawn with conditions is treated as an unresolved objection which is then submitted to the Chief Executive-in-Council for consideration.

We explained to the objectors that extension of the noise barriers or provision of a semi-enclosure to protect the concerned premises was technically infeasible as the noise structure would obstruct the sightline of motorists thereby, hence causing road safety hazards. Also, the objectors' requests for indirect technical remedies could not be acceded to as it is not government policy to provide indirect technical remedies, such as double glazed windows and air-conditioning, for buildings affected by traffic noise from existing roads.

The objectors then further requested the Administration to consider -

- (i) the extension of the semi-enclosure at Rhine Terrace, a building of approximately 270 m to the east, towards Rhine Garden as much as possible;
- (ii) the extension of the Tuen Mun bound cantilevered noise barrier up the small hill fronting Blocks 3 and 4 of Rhine Garden;
- (iii) the construction of a portal spanning over a road outside Rhine Garden near its connection to TMR as a support for the installation of noise barriers;
- (iv) the laying of low noise road surfacing on the section of TMR fronting the concerned premises; and
- (v) greening on the rocky slopes at Sham Tseng Interchange.

We explained to the objectors that extension of the semi-enclosure is limited by traffic safety considerations. The proposed construction of a portal over the road outside Rhine Garden for supporting noise barriers would also not be structurally feasible. To address the objectors' concerns, we proposed to modify the road scheme by extending the Tuen Mun

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bound cantilevered noise barriers by approximately 100 m up the small hill fronting Blocks 3 and 4 of Rhine Garden; laying low noise road surfacing on the road section fronting the concerned premises and greening up the rock slopes at Sham Tseng Interchange. Despite our explanation and the proposed modifications to the road scheme, the two objectors maintained their objections.

- (b) Two objections are related to the originally proposed cantilevered noise barriers at Castle Peak Bay. The objectors considered that the proposed noise barriers could not adequately address the noise problem and requested full noise enclosures. They also raised concern on the noise and air pollution arising from the construction works and the safety and privacy of residents due to the road being nearer the affected premises. Objectors of one of the objections were of the view that widening should be made towards the hillside and that the proposed reconstruction of TMR without additional lanes was not adequate to meet traffic demand. The objectors were also concerned about the possible loss of trees and considered that Government should provide subsidies for air conditioning and double glazed windows to residents in the light of the nuisance caused during construction.

To address the objectors' concern, we proposed to modify the road scheme by replacing cantilevered noise barriers with semi-enclosures outside Castle Peak Bay. We explained to the residents that we would closely monitor works progress to ensure minimal disturbance. We assured them that there was adequate clearance between the road and the building in addition to the presence of barriers, etc. and the safety and privacy of residents would not be compromised. We explained that we had taken care to minimize the cutting of trees during design and included planting proposals. We also advised the representative of the objectors of one objection of the technical constraints in widening the road towards the hillside. As regards the suggestion for additional lanes, we explained that no traffic need for such had

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been identified. Also, the objectors' request for subsidies could not be acceded to as it is not government policy to provide indirect technical remedies, such as double glazed windows and air-conditioning, for buildings affected by traffic noise from existing roads. The objectors of one objection withdrew their objection conditionally after noting the modified proposal and the explanations. Another objector withdrew his objection unconditionally.

- (c) One objector considered that there should be noise mitigation measures outside Greenview Terrace to protect the adjacent residents. She was also concerned that there would be tree felling on the slopes facing Greenview Terrace, causing environmental degradation.

To address the objector's concern, we proposed to modify the road scheme by extending two layers of proposed cantilevered noise barriers westwards to cover Greenview Terrace. We also advised that the widening of the section of TMR fronting Greenview Terrace would be carried out in the median area and that the slopes facing Greenview Terrace would not be affected. The objector withdrew her objection conditionally after noting the modified proposal and the explanation.

- (d) Two objectors were of the view that the proposed cantilevered noise barriers at the Sam Shing Hui section of TMR could not effectively protect Kam Fai Garden nearby. They requested the Administration to provide a noise enclosure in lieu of the cantilevered noise barriers. To address their concern, we proposed to provide a semi-enclosure at the eastbound carriageway of TMR fronting Kam Fai Garden as a replacement of the cantilevered noise barriers to help reduce traffic noise generated from vehicles climbing uphill. However, as there is a proposal to construct a

new slip road connecting TMR Town Centre section with TMR expressway at the said location under a separate project¹¹, we proposed to implement the semi-enclosure under the upcoming project, subject to further study and the results of the gazettal of that project. Noting our explanation and proposals, one objection was withdrawn unconditionally and the other was maintained.

- (e) 108 objectors expressed concerns that the provision of cantilevered barriers outside The Panorama would not effectively mitigate the traffic noise generated by heavy vehicles travelling up the slip road between Castle Peak Road and TMR during night-time. The objectors requested for the provision of a semi-enclosure in lieu of cantilevered noise barrier along the slip road.

To address their objections, we have modified the road scheme to incorporate an additional semi-enclosure 130 m long along the upramp of the slip road.

Subsequent to our explanation and offer of incorporating an additional semi-enclosure 130 m long along the upramp of the slip road, four objectors withdrew their objections unconditionally and 64 objectors withdrew their objections conditionally subject to the implementation of the proposed modifications. The remaining 40 objectors have either mismatched signatures on their withdrawal reply slips compared to those on the corresponding objection letters or not indicated their withdrawal. These objections are therefore regarded as unresolved.

22. Having considered the unresolved objections and the proposed modifications, the Chief Executive-in-Council authorised the proposed works under the Ordinance on 15 January 2008. The notice of authorisation was gazetted on 25 January 2008.

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¹¹ We upgraded **819TH** "Traffic improvements to Tuen Mun Road Town Centre Section" to Category B in March 2007.

23. We briefed the Legislative Council Panel on Transport (the Panel) on the progress of the project on 24 November 2006. We consulted the Panel again on 28 January 2008. Members supported the early implementation of the project and requested for additional information on the temporary and emergency traffic measures for reducing the impact of construction works on traffic. The additional information is at Enclosure 3.

24. We have consulted the Advisory Committee on the Appearance of Bridges and Associated Structures¹² on the aesthetic design of the proposed noise barriers under the project. The Committee accepted the proposed aesthetic design.

ENVIRONMENTAL IMPLICATIONS

25. The project is not a designated project under the Environmental Impact Assessment Ordinance (Cap. 499). We have carried out an environmental review including noise, air and water quality impacts during construction as well as landscape, visual and waste management issues. The review concluded that the project would not cause long-term environmental impacts. Nevertheless, we will implement all the recommended mitigation measures to mitigate environmental impacts to within the established standards and guidelines.

26. We have considered minimising cutting of existing slopes and maximizing angle of cut slopes through optimal road alignment design and using pre-cast concrete components in the planning and design stages to reduce the generation of construction waste as much as possible. In addition, we will require the contractor to reuse inert construction waste (e.g. excavated rock and soil materials) on site or in other suitable construction sites as far as possible, in order to minimise the disposal of construction waste to public fill reception facilities¹³. We will encourage the contractor to maximise the use of recycled or recyclable inert construction waste, as well as the use of non-timber formwork to further minimise the generation of construction waste.

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¹² The Advisory Committee on the Appearance of Bridges and Associated Structures, which comprises representatives of the Hong Kong Institute of Architects, the Hong Kong Institution of Engineers, Architectural Services Department, Highways Department, Housing Department, Planning Department and Civil Engineering and Development Department, is responsible for vetting the design of bridges and other structures associated with the public highway system, including noise barriers and semi-enclosures, from the aesthetic and visual impact points of view.

¹³ Public fill reception facilities are specified in Schedule 4 of the Waste Disposal (Charges for Disposal of Construction Waste) Regulation. Disposal of inert construction waste in public reception facilities requires a licence issued by the Director of Civil Engineering and Development.

27. 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 to public fill reception facilities and landfills respectively through a trip-ticket system.

28. We estimate that the project will generate about 2 752 500 tonnes of construction waste. Of these, we will reuse about 2 190 000 tonnes (79.6%) of inert construction waste on site and deliver about 540 000 tonnes (19.6%) of inert construction waste to public fill reception facilities for subsequent reuse. In addition, we will dispose of about 22 500 tonnes (0.8%) 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 \$17.4 million for this project (based on a unit cost of \$27/tonne for disposal at public fill reception facilities and \$125/tonne¹⁴ at landfills).

HERITAGE IMPLICATIONS

29. The project will not affect any declared monuments, proposed monuments, graded historic sites/buildings and Government historic sites identified by the Antiquities and Monuments Office. In accordance with the archaeological impact assessment conducted in March 2003 during the investigation and preliminary design assignment, some archaeological remains were found adjacent to the TMR site boundary near So Kwun Wat and Siu Lam. The consultants recommended that the works should be carefully monitored at the above locations and further investigation and evaluation will be carried out if necessary.

/LAND

¹⁴ This estimate has taken into account the cost of developing, operating and restoring the landfills after they are filled and the aftercare required. It does not include the land opportunity cost for existing landfill sites (which is estimated at \$90/m³), nor the cost to provide new landfills (which is likely to be more expensive) when the existing ones are filled.

LAND ACQUISITION

30. The project does not require resumption of private land. However, land clearance will affect 22 structures and six families in Tsuen Wan and 170 structures and nine families in Tuen Mun. The Director of Housing will offer these families accommodation in public housing or temporary housing areas in line with the existing housing policy. We will charge the land acquisition and clearance costs, estimated to be \$7.2 million, to **Head 701** "Land Acquisition". A breakdown of the land clearance costs is at Enclosure 4. We have reviewed the design of the project to minimise the land clearance cost.

TEMPORARY TRAFFIC DIVERSION PROPOSALS

31. TMR is a major trunk road linking Tsuen Wan with the Northwest New Territories area. We presented the contingency measures to deal with traffic incidents and emergencies in TMR during implementation of this project to TMDC in July 2007. We will further liaise with the TWDC and TMDC on the temporary measures to minimise the impacts of project implementation on the traffic and report regularly about the progress and performance of the temporary traffic arrangements. Details of the temporary traffic arrangements are at Enclosure 3.

BACKGROUND INFORMATION

32. We upgraded **746TH** to Category B in September 2000.

33. In June 2001, we upgraded part of **746TH** to Category A as **755TH** "Reconstruction and improvement of Tuen Mun Road – investigation and preliminary design" at an estimated cost of \$37.8 million in MOD prices. We engaged consultants in April 2002 to undertake the investigation and preliminary design and the ground investigation works for the project. The consultants completed the works in April 2004. In June 2004, we upgraded part of **746TH** to Category A as **792TH** "Reconstruction and improvement of Tuen Mun Road – detailed design and associated site investigations" at an estimated cost of \$71.6 million in MOD prices. We engaged consultants in November 2005 to undertake the detailed design and the ground investigation works for the project. We completed the ground investigation works in October 2007.

34. Of the about 9 300 numbers of trees within the project boundary, about 4 100 numbers of trees may be preserved. The proposed works will involve the removal of about 5 200 numbers of trees including about 5 190 trees to be felled and about 10 numbers of trees to be replanted within the project site. All of the trees to be removed are not important trees¹⁵. We will incorporate planting proposals as part of the project, including estimated quantities of about 157 000 trees, 108 500 shrubs and 283 000 square metres of grassed area.

35. We estimate that the proposed works will create about 2 020 jobs (360 for professional/technical staff and 1 660 for labourers) providing a total employment of about 85 300 man-months.

Transport and Housing Bureau
February 2008

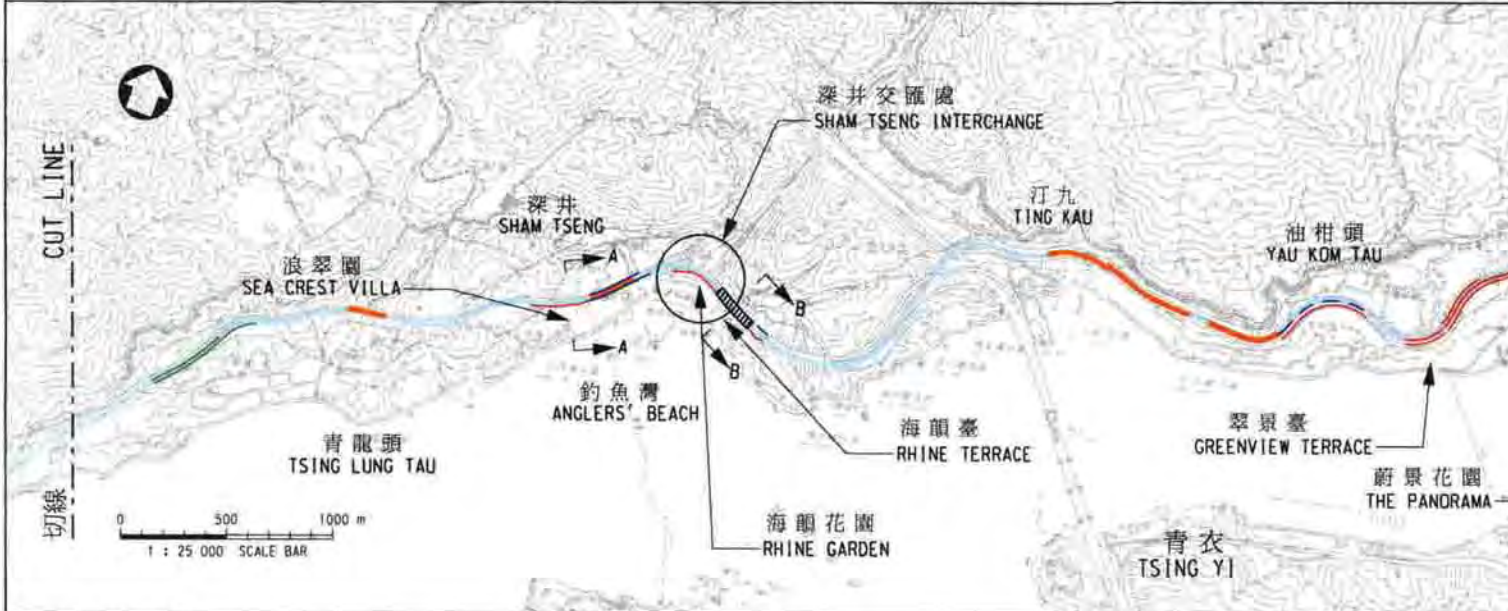
¹⁵ “Important trees” refer to trees in the Register of Old and Valuable Trees, or any other trees that meet one or more of the following criteria –

- (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 events;
- (c) trees of precious or rare species;
- (d) trees of outstanding form (taking account of overall tree size, shape and any special features) e.g. trees with curtain like aerial roots, trees growing in unusual habitat; or
- (e) trees with trunk diameter equal or exceeding 1.0 metre (measured at 1.3 metre above ground level), or with height/canopy spread equal or exceeding 25 metres.



索引圖
KEY PLAN

比例 SCALE 1:250 000



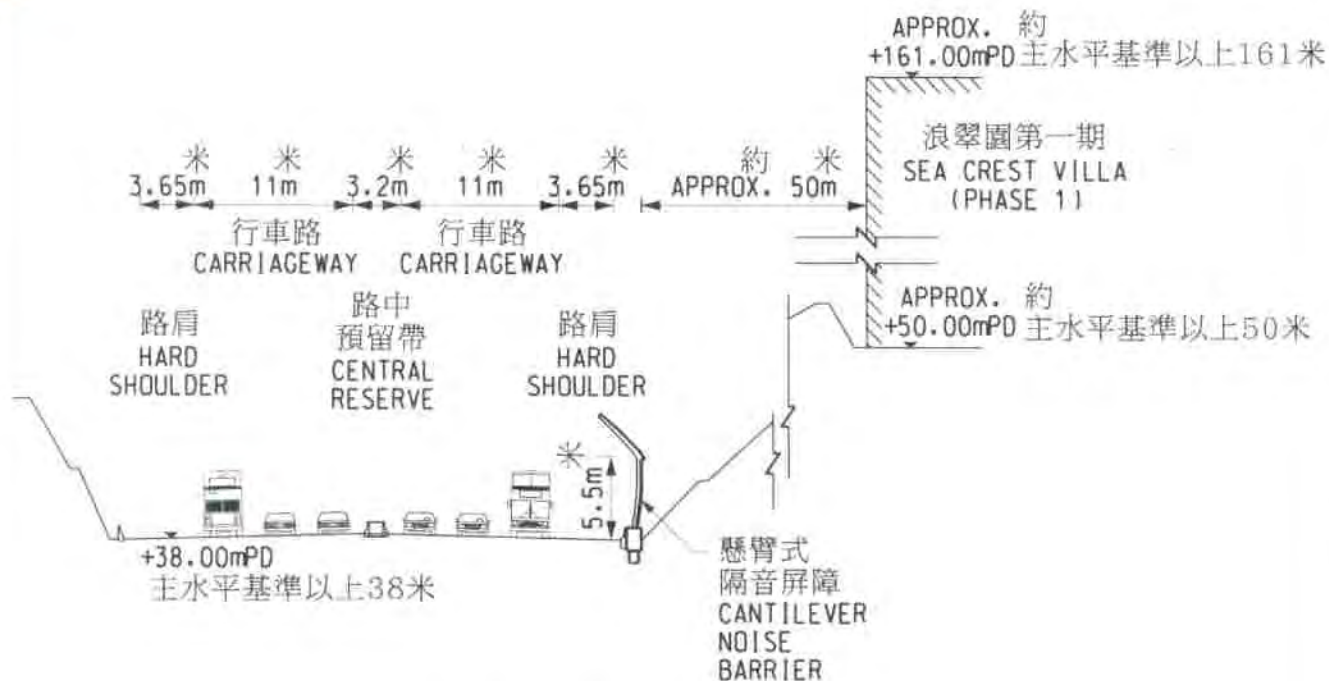
圖例
LEGEND

- 擬重建/改善的地面路段
AT-GRADE ROAD SECTIONS TO BE RECONSTRUCTED/IMPROVED
- 擬改善的現有行車橋/高架道路
EXISTING VEHICULAR BRIDGES /VIADUCTS TO BE IMPROVED
- 擬建之1.5/2米高直立式隔音屏障
PROPOSED 1.5/2m HIGH VERTICAL NOISE BARRIER
- 擬建之4米高直立式隔音屏障
PROPOSED 4m HIGH VERTICAL NOISE BARRIER
- 擬建之5.6/7.6米高懸臂式隔音屏障
PROPOSED 5.6/7.6m HIGH CANTILEVER NOISE BARRIER
- 擬建之8/8.3米高懸臂式隔音屏障
PROPOSED 8/8.3m HIGH CANTILEVER NOISE BARRIER
- 擬建之9米高半封闭式隔音屏障
PROPOSED 9m HIGH SEMI - ENCLOSURE
- 擬建之5.5米高半封闭式隔音屏障
PROPOSED 5.5m HIGH SEMI - ENCLOSURE

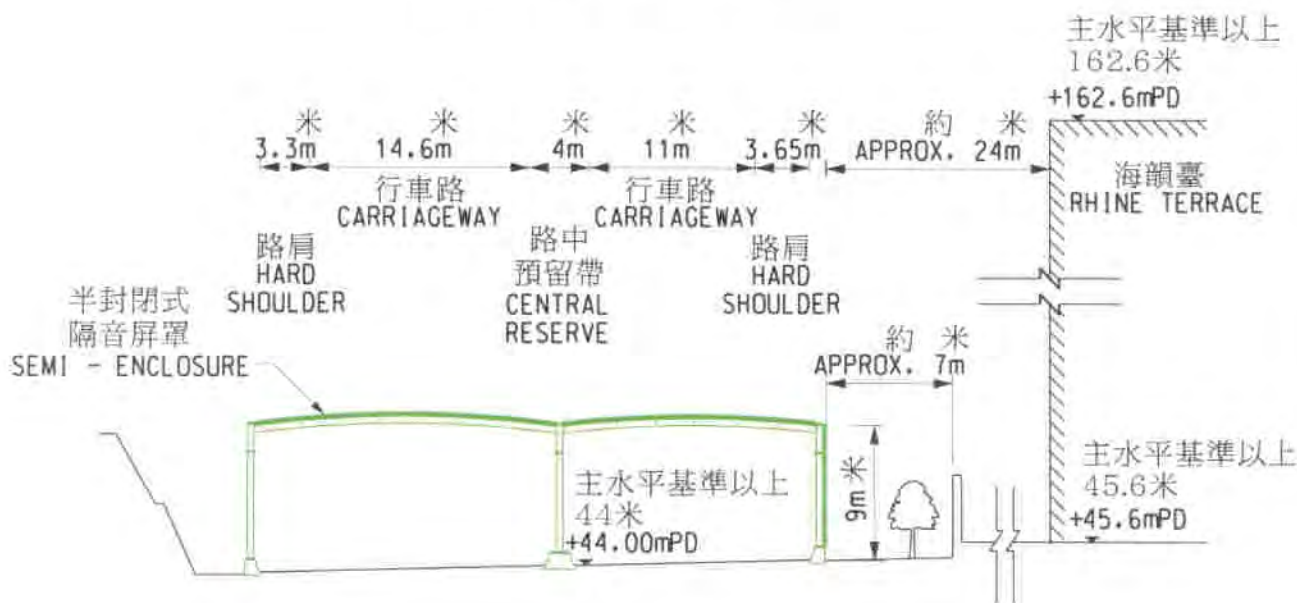
圖則名稱 drawing title

工務計劃項目第746TH號-屯門公路重建及改善工程
PWP ITEM No.746TH - RECONSTRUCTION AND IMPROVEMENT OF TUEN MUN ROAD

設計 designed C.Y. TANG 18/01/08	SIGNED	繪圖 drawn W.L. LAM 18/01/08	SIGNED	圖則編號 drawing no. HMW6746TH-SP0005	比例 scale 1:25 000 OR AS SHOWN
覆核 checked S.C. WONG 18/01/08	SIGNED	批准 approved P.D. MORGAN 18/01/08	SIGNED	© 版權所有 COPYRIGHT RESERVED	
主要工程管理局 MAJOR WORKS PROJECT MANAGEMENT OFFICE				路政署 HONG KONG	



橫切面 SECTION A-A
不按比例 NOT TO SCALE



橫切面 SECTION B-B
不按比例 NOT TO SCALE

圖例
LEGEND

- 隔音板
NOISE BARRIER PANEL

圖則名稱 plan title 工務計劃項目第746TH號 -屯門公路重建及改善工程 -橫切面 PWP ITEM No. 746TH - RECONSTRUCTION AND IMPROVEMENT OF TUEN MUN ROAD - SECTIONS	設計 designed SIGNED C.Y. TANG 14/01/08	繪圖 drawn SIGNED W.L. LAM 14/01/08	圖則編號 plan no. HMW6746TH-SP0004	此例 scale NOT TO SCALE
	覆核 checked SIGNED S.C. WONG 14/01/08	批准 approved SIGNED P.D. MORGAN 14/01/08	© 版權所有 COPYRIGHT RESERVED	
主要工程管理處 MAJOR WORKS PROJECT MANAGEMENT OFFICE			 HIGHWAYS 路 DEPARTMENT 政 HONG KONG 署 香 港	

746TH – Reconstruction and improvement of Tuen Mun Road**Breakdown of estimates for consultants' fees (in September 2007 prices)**

		Estimated man- months	Average MPS* salary point	Multiplier (Note 1)	Estimated fee (\$million)
Consultants' staff costs					
(a) Construction supervision and contract administration (Note 2)	Professional	—	—	—	7.4
	Technical				7.5
(b) Resident site staff	Professional	1 700	38	1.6	154.9
	Technical	7 180	14	1.6	216.4
(c) EM&A programme	Professional	8	38	2.0	1.0
	Technical	20	14	2.0	0.7
				Total	387.9

* MPS = Master Pay Scale

Notes

1. A multiplier of 2.0 is applied to the average MPS point to arrive at the full staff costs including the consultants' overheads and profit as the staff will be employed in the consultants' offices. A multiplier of 1.6 is applied to the average MPS point to arrive at the cost of resident site staff supplied by the consultants. (As at 1 April 2007, MPS pt. 38 = \$56,945 per month, and MPS pt. 14 = \$18,840 per month).
2. The consultants' fees for construction supervision and contract administration are estimated in accordance with the terms stipulated in Agreement No. CE 22/2005(HY) titled "Reconstruction and Improvement of Tuen Mun Road – Design and Construction". The construction phase of the assignment will only be executed subject to Finance Committee's approval to upgrade **746TH** to Category A.

Enclosure 3 to PWSC(2007-08)88

Temporary and Emergency Traffic Measures to be Adopted during the Construction Stage

To minimise disturbance to the traffic along Tuen Mun Road during the construction stage, the following measures will be implemented –

- (a) some of the construction works will be carried out during non-rush hours. Tuen Mun Road will remain to be operating with the existing number of traffic lanes during rush hours (i.e. 7:00 a.m. to 8:00 p.m. (Kowloon bound)/9:00 p.m. (Tuen Mun bound)). The widened hard shoulder will be used to divert traffic as far as practicable;
- (b) a traffic management liaison group (the Group), to be made up by representatives of Transport Department (TD), Highways Department and the Police, will be established to assess the temporary traffic arrangements (TTAs) to be proposed by the contractor. The Group will regularly report to the relevant District Council(s) on the performance of the TTAs, and if necessary, consult the relevant District Council(s) in advance should any new major TTA is to be implemented;
- (c) when preparing the TTAs, the contractor is required to designate the routes for towing and emergency vehicles to ensure their early arrival at the scene. The contractor is also required to arrange standby towing vehicles at strategic locations to facilitate timely removal of broken-down vehicles so that normal traffic can be resumed as quickly as possible;
- (d) in case of traffic incidents, resident site staff will alert TD and the police through a hotline. Depending on the situation, the following actions will be taken in case of emergency –
 - (i) if land transport services are affected by traffic congestion on Tuen Mun Road, TD will keep close contact with relevant public transport operators and request the railway operator to reinforce the Light Rail and West Rail services between Tuen Mun and the urban area;
 - (ii) TD will also consider using the variable message signs installed at Kong Sham Western Highway, San Tin Highway (near Kwu Tung), San Sham Road in Lok Ma Chau, Yuen Long Highway, Hung Tin Road and Long Tin Road to disseminate to drivers real-time traffic information about Tuen Mun Road; and
 - (iii) depending on the situation, TD will advise motorists to take alternative routes (such as Route 3) to Kowloon through radio or other media.

746TH – Reconstruction and improvement of Tuen Mun Road

Breakdown of land clearance cost

	\$ million
Clearance cost	7.200
(a) Compensation for crops	1.000
(b) Ex-gratia compensation for miscellaneous permanent improvements to farms	6.198
(c) “Tun Fu” ceremonial fees	0.002
Total land clearance costs	7.200