

ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

HEAD 706 – HIGHWAYS

Transport – Roads

759TH – Shenzhen Western Corridor

736TH – Deep Bay Link

Members are invited to recommend to Finance Committee –

- (a) the upgrading of **759TH** to Category A at an estimated cost of \$3,188.0 million in money-of-the-day prices for construction of the Shenzhen Western Corridor; and
- (b) the upgrading of **736TH** to Category A at an estimated cost of \$4,594.6 million in money-of-the-day prices for construction of the Deep Bay Link.

PROBLEM

The capacity of the existing vehicular boundary crossings between the Hong Kong Special Administrative Region (HKSAR) and Shenzhen is insufficient to cope with the present and expected future traffic demand between the two areas.

/PROPOSAL

PROPOSAL

2. The Director of Highways, with the support of the Secretary for the Environment, Transport and Works, proposes to upgrade **759TH** and **736TH** to Category A at an estimated cost of \$3,188.0 million and \$4,594.6 million respectively in money-of-the-day (MOD) prices for the construction of the Shenzhen Western Corridor and the Deep Bay Link.

PROJECT SCOPE AND NATURE

Shenzhen Western Corridor (SWC)

3. The latest scope of **759TH** includes –
- (a) construction of a 3.2-kilometre dual three-lane carriageway spanning across Deep Bay from Ngau Hom Shek in the north west part of the New Territories (NWNT) of the Hong Kong Special Administrative Region (HKSAR) to the HKSAR's boundary of the SWC;
 - (b) construction of a traffic control surveillance system (TCSS);
 - (c) associated civil, structural, electrical and mechanical (E&M), marine, geotechnical, water works, fire services, environmental mitigation measures, street lighting, traffic aids and directional signs; and
 - (d) provision of lane change-over facilities to accommodate the different traffic configurations in Hong Kong and the Mainland.

Deep Bay Link (DBL)

4. The latest scope of **736TH** includes –
- (a) construction of a 5.4-kilometre dual three-lane carriageway linking the SWC at its landing point in Ngau Hom Shek with the Yuen Long Highway (YLH) at Lam Tei;
 - (b) construction of two interchanges respectively at Lam Tei and Ha Tsuen and an access road to connect DBL with Ha Tsuen areas;
 - (c) construction of turnaround facilities with weighing station, vehicle recovery base and helipad at Ha Tsuen Interchange;

/(d)

- (d) construction of a TCSS; and
- (e) associated civil, structural, E&M, geotechnical, landscape and drainage works, fire services, water works, environmental mitigation measures, street lighting, traffic aids and directional signs.

A map showing the location of the SWC and the DBL and other major related existing/planned projects is at Enclosure 1. A site plan and the typical sections of the SWC and the DBL are at Enclosures 2 and 3.

5. We have substantially completed the detailed design for **759TH** and **736TH** and related working drawings are being prepared. For SWC, we plan to invite tenders in April 2003 and commence construction in August 2003. For DBL, we plan to invite tenders in February 2003 and commence construction in June 2003. Both projects are scheduled for completion in December 2005.

JUSTIFICATION

6. The capacities of the three existing vehicular boundary crossings at Lok Ma Chau, Man Kam To and Sha Tau Kok between the HKSAR and Shenzhen are near saturation. The average total daily vehicular traffic using the three crossings in 2001 was 31 006, representing a 27% growth over the past five years and an average annual growth of 5%.

7. The Crosslinks Further Study (the Study) completed by Planning Department in early 2001 has assessed the future cross-boundary traffic demand and confirmed the need to construct the fourth vehicular land boundary crossing (i.e. the SWC) to cater for the increasing traffic demand and the future development needs in the NWNT. The SWC will connect the NWNT to Shekou of Shenzhen. The DBL is the connecting road for conveying the cross-boundary traffic from the SWC to the existing YLH. The average daily two-way traffic demand in 2001 and the estimated traffic in 2006, 2011 and 2016 in respect of the existing and future cross-boundary points, assuming the commissioning of the SWC in 2005, are as follows –

/Cross

Cross-Boundary Points	2001 ¹	2006	2011	2016
	(two-way vehicles/day)			
Lok Ma Chau	21 824	24 800	24 700	25 000
Man Kam To	6 885	9 700	9 800	10 000
Sha Tau Kok	2 297	2 200	2 400	2 300
SWC	-	28 400	46 100	80 000
Total	31 006	65 100	83 000	117 300

The projected daily vehicular traffic in 2006 would exceed the handling capacity of 42 500 vehicles per day of the three existing boundary crossings.

8. The SWC, together with the DBL, would facilitate the flow of people and cargo between Hong Kong and the southern part of the Mainland. They will enhance the status of Hong Kong as a business/trade/logistics hub in the Pearl River Delta, and will also bring substantial benefits to Hong Kong. The Study estimates the net benefit of the SWC would be \$175 billion (in 1998 prices) over a 20-year planning horizon from 2000 to 2020.

FINANCIAL IMPLICATIONS

Estimate for 759TH

9. We estimate the cost of the section of the SWC to be funded by the HKSAR Government to be \$3,188.0 million in MOD prices, made up as follows –

	\$ million
(a) Approach viaduct	1,582.2
(b) Cable-stayed bridge	729.0
(c) Roadworks, traffic aids, lighting and waterworks	228.5
(d) Environmental mitigation measures (including Mai Po Enhancement Scheme)	18.4
(e) TCSS	17.9
(f) E&M works	79.0
(g) Lane change-over facilities	110.0

/(h)

¹ Actual figures provided by Immigration Department.

		\$ million	
(h)	Overseas duty visits ²	0.2	
(i)	Consultants' fees	166.9	
	(i) construction supervision and contract administration	16.6	
	(ii) site staff costs	144.3	
	(iii) environmental monitoring and audit (EM&A) programme	3.0	
	(iv) Electrical and Mechanical Services Trading Fund (EMSTF) charges ³	3.0	
(j)	Contingencies	280.0	
	Sub-total	3,212.1	(in September 2002 prices)
(k)	Provision for price adjustment	(24.1)	
	Total	3,188.0	(in MOD prices)

A breakdown of the estimates for consultants' fees is at Enclosure 4.

10. The approach viaduct of the SWC is a 2.7-kilometre long elevated concrete viaduct with a deck area of about 87 000 square metres (m²). The pier spacing is about 70 to 75 metres. The estimated costs for the pier and pile foundation are about \$776.9 million while that for the elevated deck is about \$805.3 million. The cable-stayed bridge has a main span of 210 metres and is 458 metres long in total. It is supported by a single central inclined 158 metre high

/tower

² Duty visits are required to ensure that overseas acceptance tests for some specialised components of the bridge and steel bridge deck fabrication are properly done. Attendance on factory acceptance tests of E&M components is also required. While the exact nature of the duty visits will be confirmed after the award of contract, it is estimated that five overseas visits, each lasting three to five days (depending on the number of places to be visited) to be attended by two officers between 2003 and 2005 are needed. The costs of air passage, subsistence allowances, etc. are subject to the relevant provisions in the Civil Service Regulations.

³ Since the establishment of the EMSTF on 1 August 1996 under the Trading Fund Ordinance, the EMSTF charges government departments for design and technical consultancy services for E&M installations provided by Electrical and Mechanical Services Department (EMSD). The services rendered for this project include checking consultants' submissions on all E&M installations and providing technical advice to the Government on all E&M works and their impacts on the project.

tower. The tower structure, including its foundation and cable support system, is estimated to cost \$145.7 million. The elevated steel deck, which has an area of about 17 700 m², is estimated to cost \$435.5 million. The side span supports and associated ship impact protection structures are estimated to cost \$147.8 million. The \$228.5 million roadworks, traffic aids, lighting and waterworks item includes road surfacing and water proofing, road drainage and street lighting, utilities, traffic aids and associated access road improvement works.

11. We have also included in the proposed scope of construction of the SWC project a provision for lane change-over facilities in view of the different traffic configurations in Hong Kong and the Mainland. Owing to site constraints on the Hong Kong side, we have agreed with the Shenzhen Municipal People's Government that the lane change-over facilities, in the form of elevated viaducts, will be located within the Shenzhen portion of the SWC near Dongjiaotou. As the facilities are essential features serving the needs of both Hong Kong and Shenzhen, the cost will be shared between the two sides. Pending our discussion with the Shenzhen side over the layout design and the detailed cost sharing arrangement, we have included an estimate of \$110 million in the total project cost, which is about half of the cost of the lane change-over facilities as estimated by the Shenzhen side.

12. At the 4th Plenary of the Hong Kong / Guangdong Cooperation Joint Conference held on 25 July 2001, agreement was reached on the principle of co-locating the boundary crossing facilities (BCF) for immigration and customs on the new reclamation at Dongjiaotou in Shenzhen. The scope of the BCF does not form part of the SWC project and will be the subject of a separate submission of funding proposal by the Secretary for Security. However, the TCSS for the SWC project will require to be extended beyond the HKSAR boundary to provide data and communication linkage with the Hong Kong Portion of the BCF. This linkage, which is outside the boundary of the HKSAR, is included in the SWC project scope. The purpose of this linkage is to enable the BCF to receive information in relation to the traffic situation on the SWC and the DBL so that in the event of traffic incidents or accidents, corresponding responsive actions and emergency plans in the BCF can be triggered.

13. We estimate the annual recurrent expenditure arising from the proposed works within HKSAR to be \$17.1 million.

/Estimate

Estimate for 736TH

14. We estimate the cost of the DBL to be \$4,594.6 million in MOD prices, made up as follows –

	\$ million
(a) Elevated highway structures	2,735.1
(b) Site formation, slope works and retaining structures	216.7
(c) Roadworks, drainage, traffic aids, lighting and waterworks	445.7
(d) Environmental mitigation measures ⁴	458.9
(i) noise barriers	323.2
(ii) semi-enclosures	102.9
(iii) others ⁵	32.8
(e) TCSS	37.4
(f) Weighing station, helipad, E&M and other ancillary works	14.5
(g) Landscaping works	32.8
(h) Re provisioning for Hing Tak Public School ⁶	0.8

/(i)

⁴ Out of the estimated cost of \$426.1 million for noise barriers and semi enclosures, provisions for noise barriers for existing and planned developments are estimated to be \$139.1 million and \$287.0 million respectively.

⁵ Other environmental mitigation measures include –

- (a) noise-reducing road surfacing;
- (b) on site dust-control measures and noise screens during construction;
- (c) construction wastewater treatment system including chemical processes and sedimentation;
- (d) appraisal and remediation of existing contaminated land;
- (e) construction and maintenance of temporary wetland compensation and construction of wetland compensation area;
- (f) construction of a one-metre wide shoulder inside two road crossing drainage culverts for terrestrial wildlife to pass through; and
- (g) archaeological rescue works.

⁶ The DBL will affect the existing Hing Tak Public School at Lam Tei and we need to re provision the school. A new standard school is now being constructed under **301EP** by the Architectural Services Department near Hing Ping Road at Tuen Mun for completion before the 2004/05 school year. Apart from re provisioning the existing school to be affected by the DBL, the new school will also cater for the projected shortfall in classrooms in the Tuen Mun District. During the period between the anticipated clearance of Hing Tak Public School in July 2003 and the completion date of the new school, we have to arrange temporary schooling in another school at Butterfly Estate of Tuen Mun. The cost of school removals as well as the student coach services as requested by the school management during the temporary schooling period will be charged to the project vote of **736TH**.

		\$ million	
(i)	Consultants' fees	321.4	
	(i) construction supervision and contract administration	26.3	
	(ii) site staff costs	290.4	
	(iii) EM&A programme	1.8	
	(iv) EMSTF charges	2.9	
(j)	Contingencies	366.0	
	Sub-total	4,629.3	(in September 2002 prices)
(k)	Provision for price adjustment	(34.7)	
	Total	4,594.6	(in MOD prices)

A breakdown of the estimates for consultants' fees is at Enclosure 4.

15. The elevated highway structures at an estimated cost of \$2,735.1 million comprise the construction of all sections of elevated structures, namely, the 3.4-kilometre dual three-lane mainline of the DBL and all elevated ramps at Lam Tei and Ha Tsuen Interchanges. The costs include piling and foundation works, column erection and the construction of the viaduct decks including street furniture such as profile barriers. The estimate has taken into account the construction method by precast segmental construction, site arrangements and access routes and the tight commissioning programme.

16. The estimated cost of the site formation, slope works and retaining structures are \$216.7 million. The works include general excavation, filling, slope cutting, retaining walls and bored pile walls for the construction of elevated roads and natural terrain hazard mitigation measures such as stabilisation of boulders or provision of boulder fences.

17. The estimated costs for the item on roadworks, drainage, traffic aids, lighting and waterworks are \$445.7 million. The estimate includes earthworks for the construction of the at-grade sections of the carriageway, sign gantries and other traffic aids, street lighting, utilities and drainage provisions.

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18. We estimate that the annual recurrent expenditure arising from the proposed works to be \$32.9 million.

Easterly Link Road

19. We consulted the Legislative Council Panel on Transport in November 2001 and January 2002 on the SWC and the DBL prior to making the funding submission to the Public Works Sub-committee (PWSC) in January 2002 on the detailed design of the two projects. In March 2002, the Finance Committee approved the funding for the detailed design of the two projects together with the requirement to investigate and design an Easterly Link Road (ELR) as requested by Members. The ELR serves as an additional access road connecting the SWC/DBL to the existing road system to facilitate traffic heading east from DBL after landing at Ngau Hom Shek.

20. We have conducted a study and identified initially 13 possible alignments for the ELR at Enclosure 5. Six options were shortlisted for further study. We consider alignment option 6A as shown at Enclosure 5 to be the most preferred one having regard to engineering, land, planning, environmental and transport considerations. An analysis of the six shortlisted options is at Enclosure 6.

21. The analysis also shows that the transport benefit of the preferred option of ELR is rather limited with a saving of journey time of about two minutes while the cost of this option is \$900 million (excluding land acquisition costs). There are also other implications on the planning of the Hung Shui Kiu New Development Area.

22. Given the problems identified above, we consider it prudent to consider further on the way forward for the ELR in the context of an on-going overall review of the transport infrastructure in NWNT, including projects which may need to be advanced for the transport link to the West Bank of the Pearl River Delta i.e. the Tuen Mun Western Bypass and the Tuen Mun-Chek Lap Kok Link. This will enable a more comprehensive look at the relative priorities of planned road projects in the NWNT in the light of limited financial resources.

23. The proposal for the DBL cannot be delayed since it is the only link with the SWC and the local network. The SWC cannot operate without the DBL. It is the stated commitment of both the Shenzhen Municipal People's Government and the HKSAR Government to strive to complete the SWC by 2005 in view of its economic significance to both Shenzhen and Hong Kong. The SWC/DBL are to be taken as the centre piece in our review of the transport infrastructure in NWNT.

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24. Subject to approval, we will phase the expenditure as follows -

Estimate for 759TH

Year	\$ million (Sep 2002)	Price Adjustment Factor	\$ million (MOD)
2003 – 2004	448.0	0.99250	444.6
2004 – 2005	1,192.0	0.99250	1,183.1
2005 – 2006	1,215.0	0.99250	1,205.9
2006 – 2007	223.2	0.99250	221.5
2007 – 2008	133.9	0.99250	132.9
	3,212.1		3,188.0

Estimate for 736TH

Year	\$ million (Sep 2002)	Price Adjustment Factor	\$ million (MOD)
2003 – 2004	771.9	0.99250	766.1
2004 – 2005	1,378.4	0.99250	1,368.1
2005 – 2006	1,658.6	0.99250	1,646.2
2006 – 2007	407.7	0.99250	404.6
2007 – 2008	101.1	0.99250	100.3
Beyond 2008 ⁷	311.6	0.99250	309.3
	4,629.3		4,594.6

⁷ Expenditure beyond 2008 is for provision of those noise barriers (inclusive of contingencies) which will be phased in to tie in with the planned developments they are intended to serve.

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25. We have derived the MOD estimate on the basis of the Government's latest forecast of trend labour and construction prices for the period 2003 to 2008. We will tender the proposed works under standard re-measurement contracts because the actual quantities of the foundation works are subject to variations. The contracts will provide for price adjustment as the construction periods will exceed 21 months.

PUBLIC CONSULTATION

26. We presented the major findings of the detailed feasibility studies for the SWC and the DBL to the Tuen Mun District Council and the Yuen Long District Council on 15 March and 19 March 2002 respectively. Both District Councils supported the projects.

27. We gazetted the road schemes for the SWC and the DBL under the Roads (Works, Use and Compensation) Ordinance on 15 March 2002. For the SWC, we received three objections. Among these objections, one was from the World Wide Fund for Nature Hong Kong (WWF) in relation to the environmental degradation of Deep Bay, while the other two were from the tenant 'Tang Yau Kung Tong' and sub-tenant 'Yue Wo Tong' in relation to the renewal of the oyster bed tenancy in Deep Bay. In handling the three objections, we clarified the misunderstanding of the objectors on the road scheme, and where appropriate explained the Government's policies and measures which could be taken to address their concerns. The three objectors ultimately withdrew their objections unconditionally. The project was authorised under the Roads (Works, Use and Compensation) Ordinance and the notice of authorisation was gazetted on 3 January 2003. As for the DBL, we received 1 014 objections from the public. We conducted three series of meetings with the objectors and explained to them the relevant government policies. Ten objections were resolved and the remaining unresolved objections were submitted to the Chief Executive-in-Council for consideration. Among these unresolved objections, 600 objections were primarily concerned about the land acquisition, compensation and re-housing arrangement. The remaining ones were related to the need, timing and alignment of the DBL. The Chief Executive-in-Council authorised the road scheme of the DBL on 26 November 2002 and the notice of authorisation was gazetted on 29 November 2002. A Legislative Council Brief announcing the authorisation was issued on 27 November 2002.

/28.

28. We consulted the Legislative Council Panel on Transport on 20 December 2002. Panel Members noted the proposal and the Administration's recommendation to defer the decision on the ELR pending the outcome of the review of the transport infrastructure in the NWNT. Members expressed concern in relation to the congestion of Tuen Mun Road. Members also raised concern and requested additional information on the noise barriers provided under the DBL project. On the need for funding at this stage for the noise barriers for planned developments, we have explained to Members that we have to fulfill the requirements under the Environmental Impact Assessment (EIA) Ordinance and the proposed noise barriers are in accordance with the recommendation of the EIA study. Hence, to show our commitment to the EIA requirement, we apply for funding for all the noise barriers though those for planned developments will only be erected at later stages to phase in with the timing for such developments. We issued a supplementary Information Paper on 4 January 2003 providing the above information.

ENVIRONMENTAL IMPLICATIONS

29. The SWC and DBL projects are designated projects under the EIA Ordinance and environmental permits are required for their construction and operation. As required by the EIA Ordinance, EIA reports for the projects were submitted to the Director of Environmental Protection (DEP) for approval. The assessments conclude that the environmental impacts of the projects can be controlled to within statutory levels.

30. The main environmental impact of the SWC is the possible deterioration in the water quality both during and after construction, causing damage to the ecology of Deep Bay. We will implement a series of mitigation measures during construction including installation of cofferdam and silt curtains at the dredging sites, use of close grab dredger and implementation of standard site practices to maintain the water quality of Deep Bay. Furthermore, to enhance the ecosystem of Deep Bay in the long term and abate the impact of degrading sedimentation situation on the Mai Po Nature Reserve, we have proposed an enhancement measure by dredging a water channel connecting Gei Wais to Deep Bay. This will relieve the problem of long term sediment deposition in the water channel, improve the water exchange rate to the Gei Wais and thus enhance the feeding ground for birds.

31. The key environmental mitigation measures for the DBL include low-noise road surfacing and noise barriers, establishment of a wetland compensation area, archaeological surveys and salvage excavation, screen planting and earth mounding. The noise barriers comprise three vertical types from three metres to six metres high

/and

and two cantilever types featuring a 5.5-metre high vertical portion with either a 2.2-metre or 2.5-metre bend in 45 degrees to the vertical. In addition, there is a section of about 200 metres of semi-enclosures. A plan showing the location of the noise barriers to be provided is at Enclosure 7.

32. The noise barriers are of transparent vertical or cantilever type while the semi-enclosures have transparent sides with non-transparent roof. Drawings showing an artistic impression of the noise barriers/semi-enclosures are at Enclosures 8 and 9. These mitigation measures will help control the noise levels to within the statutory levels. We estimate that about 2 200 existing dwellings will benefit from the provision of these noise barriers, including high rise residential buildings (e.g. the buildings at Botania Villa and Shun Tat Street), village type development (e.g. Fuk Hang Tsuen and San Sang San Tsuen) and schools (e.g. Lam Tei Gospel School). Some 7 480 future dwellings mainly at Hung Shui Kiu New Development Area and about 880 future dwellings in other planned developments are also expected to benefit from the proposed noise barriers, the timing of provision of which will phase in with such developments. The average cost of providing noise barriers per dwelling is about \$40,000. We will consult the Tuen Mun and Yuen Long District Councils on the detailed design of the barriers.

33. The Advisory Council on the Environment endorsed the EIA report on DBL on 27 August 2002 and that on SWC on 21 October 2002. Subsequently, the DEP approved the reports on 13 September 2002 and 4 November 2002 respectively. We will apply for the permit before commencement of the contracts and implement the environmental mitigation measures as recommended in the approved reports and as stipulated in the environmental permits.

34. During the planning and design stage for DBL, we have tried wherever possible to minimise the generation of construction and demolition (C&D) materials by optimising the quantities of cut and fill in the earthworks. However, since a considerable length of DBL is on viaducts, it is not possible to substantially reduce the amount of C&D materials generated from the DBL project. During the construction stage, we will control noise, dust and site surface water run-off nuisance through appropriate mitigation measures specified in the works contracts. We will implement EM&A programmes as stipulated in the EM&A Manuals during the course of construction and operation to ensure that proactive mitigation measures are in place.

35. We estimate that the DBL project will generate about 19 700 cubic metres (m³) of C&D materials. Of these, we will reuse 15 760 m³ (80%) on site, dispose of 3 940 m³ (20%) at landfills. We estimate that the SWC project will generate about 700 m³ of C&D materials and we will dispose all at landfills. The notional cost of accommodating C&D waste at landfill sites is estimated to be \$490,000 and \$88,000 for DBL and SWC respectively (based on a notional unit cost⁸ of \$125/m³).

36. We also estimate the construction of the SWC bridge piers (57 000 m³) and dredging of the water channel at Mai Po (8 800 m³) will generate about 65 800 m³ of dredged marine mud. Of these, we will deliver 34 500 m³ (52%) to an open sea disposal site and 31 300 m³ (48%) to a confined marine disposal site.

37. We will require the contractors to submit waste management plans (WMPs) for approval. The WMPs will include appropriate mitigation measures such as the identification of a designated area for waste segregation prior to disposal. We will ensure that the day-to-day operations on site comply with the approved WMPs. We will also require the contractors to use steel instead of timber for formwork and temporary work as far as practicable to further minimise the generation of waste. We will control the disposal of the C&D materials through trip-ticket systems. We will record the disposal, reuse and recycling of the C&D materials for monitoring purposes. We will maximise the use of recycled aggregates and rock products in the permanent works.

LAND ACQUISITION

38. We will resume about 300 000 m² of private land and clear about 410 000 m² of Government land. Land acquisition and clearance will affect 2 979 structures comprising 326 families/856 persons, 56 business undertakings, nine pig farms and 21 poultry farms. The Director of Housing will rehouse the eligible clearances in public housing in accordance with the existing policy. We will charge the land acquisition and clearance costs, estimated to be \$663.6 million for DBL and \$11.3 million for SWC in September 2002 prices to **Head 701** - "Land Acquisition" **Subhead 1100CA** - "Compensation and ex-gratia allowances in respect of projects in the Public Works Programme".

/39.

⁸ 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/m³), nor the cost to provide new landfills (which are likely to be more expensive) when the existing ones are filled. The notional cost estimate is for reference only and does not form part of this project estimate.

BACKGROUND INFORMATION

39. We upgraded **759TH** and **736TH** and to Category B in October 2001 and September 1999 respectively.

40. We engaged consultants in August 2001 to undertake the investigation and planning of SWC at a cost of \$14.5 million in MOD prices under **Subhead 6100TX**. We completed the investigation in November 2002. We have engaged consultants to undertake the investigation and preliminary design of DBL at an estimated cost of \$12.7 million in MOD prices under **Subhead 6100TX** - "Highway works, studies and investigations for items in Category D of the Public Works". We completed the investigation and preliminary design in September 2002.

41. We upgraded part of **759TH** to Category A as **772TH** "Shenzhen Western Corridor - detailed design and associated site investigations" and part of **736TH** to Category A as **773TH** "Deep Bay Link - detailed design and associated site investigations" and at an estimated cost of \$66.1 million and \$87.7 million in MOD prices respectively in March 2002. We engaged consultants to undertake the detailed design of the projects in March 2002.

42. To minimise disruption to traffic, we will carry out temporary traffic diversion arrangements as and when required. We will consult the relevant District Councils on major temporary traffic diversion arrangements before their implementation.

43. We estimate that **759TH** will generate 1 980 jobs comprising 340 professional/technical staff and 1 640 labourers, totalling 50 000 man-months. For **736TH**, we estimate that the project will generate 3 180 jobs comprising 540 professional/technical staff and 2 640 labourers, totalling 86 000 man-months.



圖例 LEGEND	
—	現有的項目 EXISTING PROJECTS
.....	建議的項目 PROPOSED PROJECTS

附件一
ENCLOSURE 1

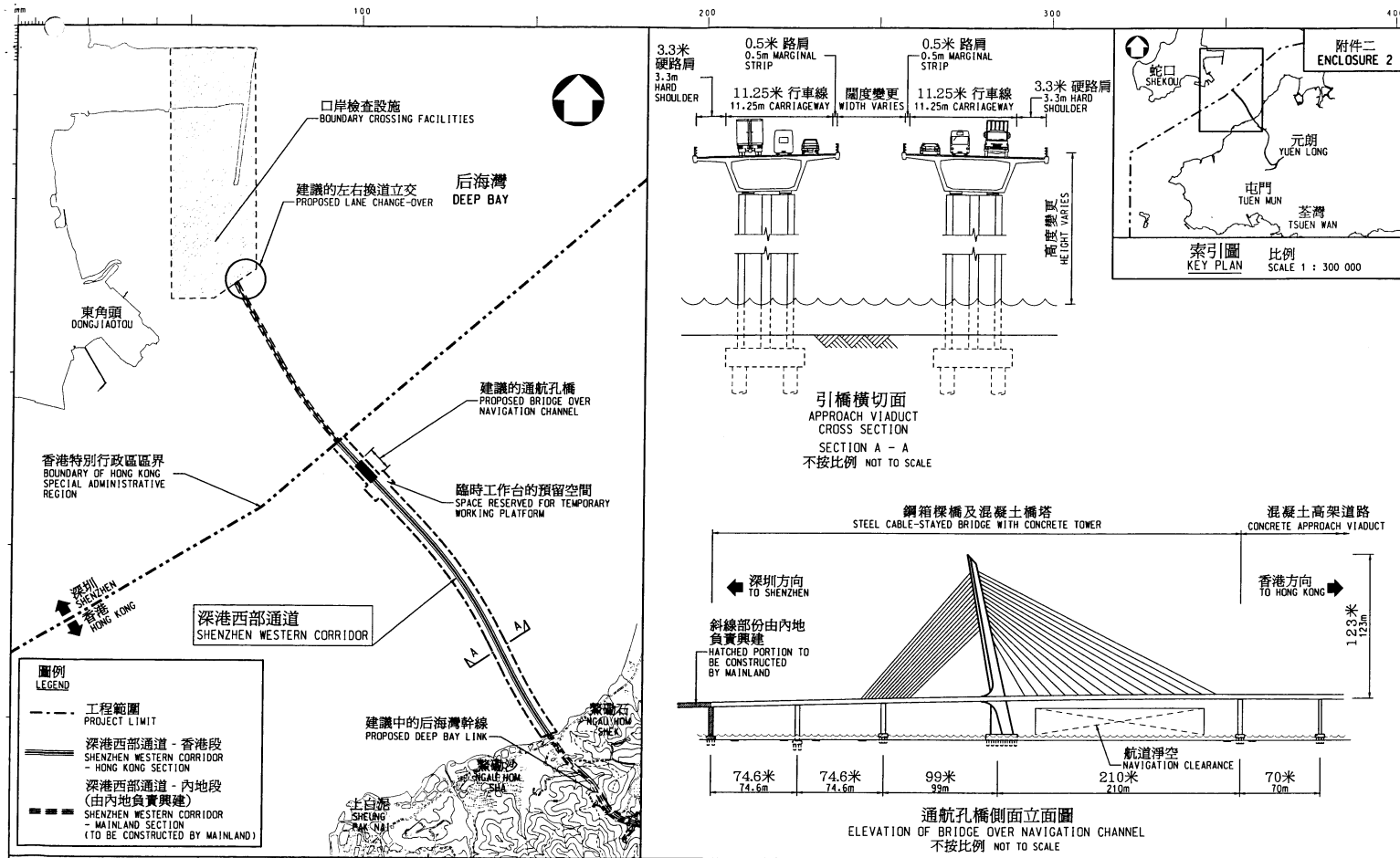
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新界西北現有及計劃中之項目
PLANNED AND EXISTING PROJECTS IN NORTHWEST
NEW TERRITORIES

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覆核 checked C.F.KU 08/01/03	批准 approved W.C. LI 08/01/03
主要工程管理局 MAJOR WORKS PROJECT MANAGEMENT OFFICE	

圖則編號 drawing no. HMW6736TH-SP0014	比例 scale 不按比例 N.T.S.
© 版權所有 COPYRIGHT RESERVED  HIGHWAYS DEPARTMENT 路政署 HONG KONG	

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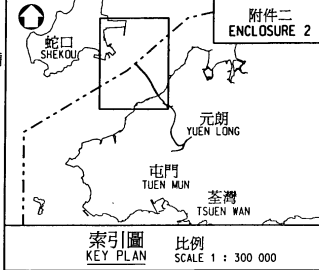
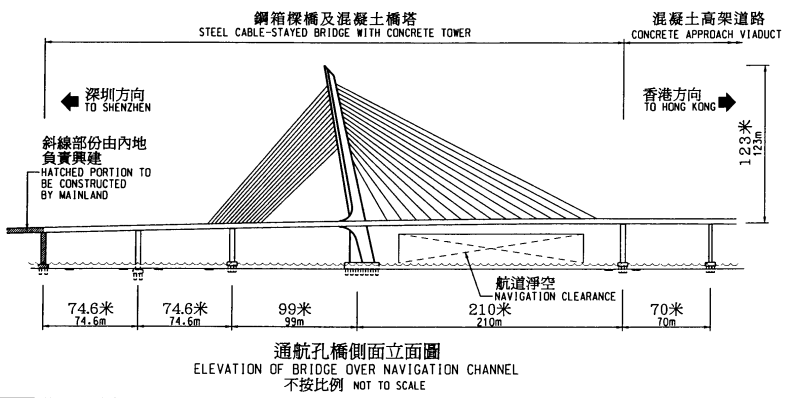
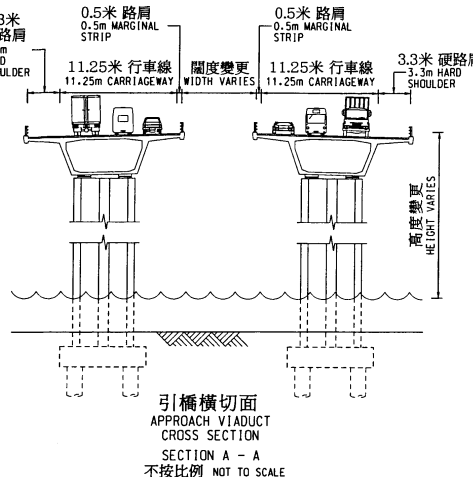


圖例
LEGEND

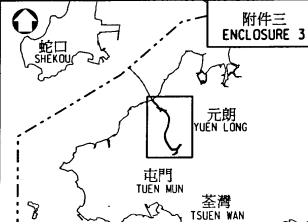
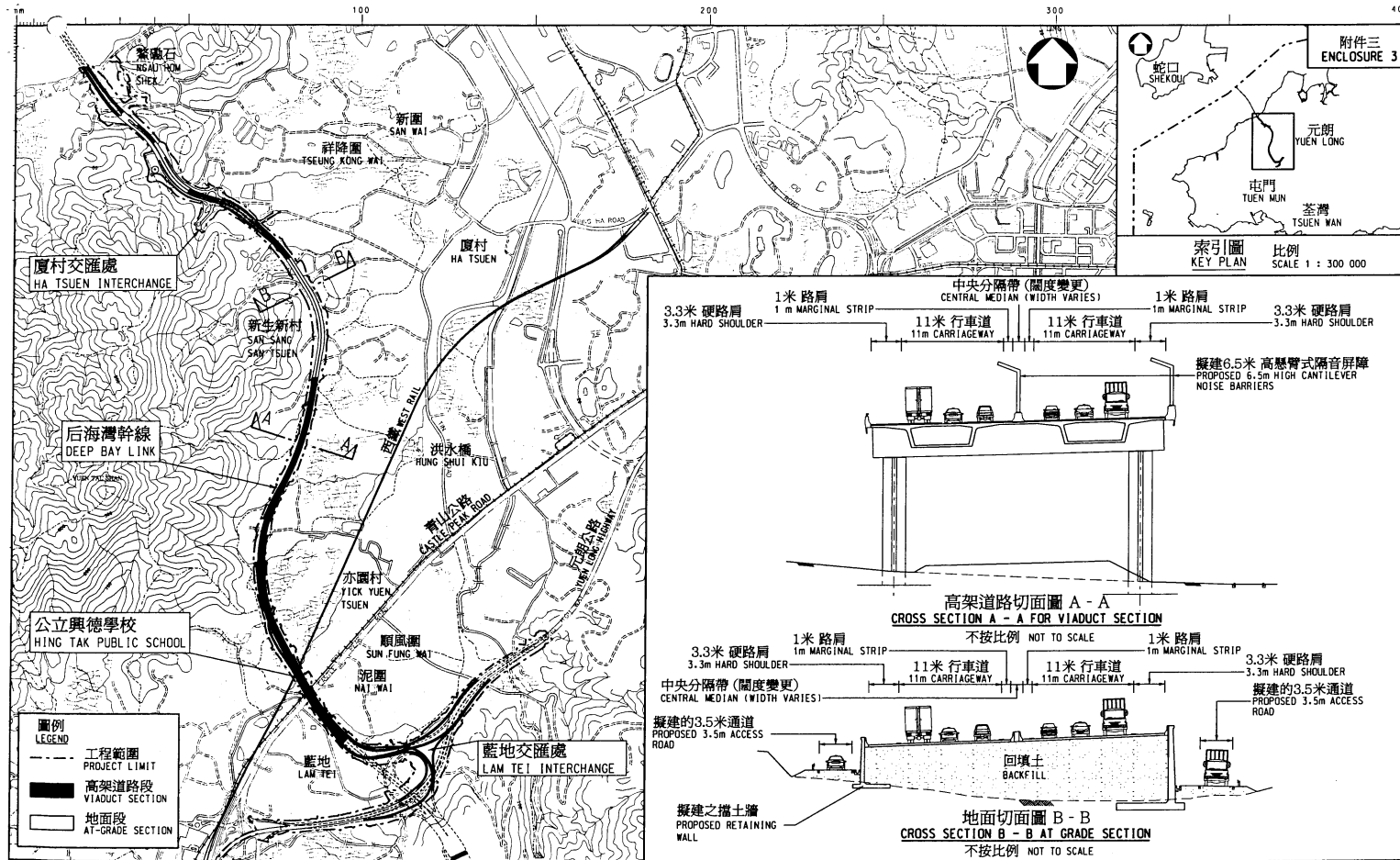
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==	深港西部通道 - 香港段 SHENZHEN WESTERN CORRIDOR - HONG KONG SECTION
---	深港西部通道 - 內地段 (由內地負責興建) SHENZHEN WESTERN CORRIDOR - MAINLAND SECTION (TO BE CONSTRUCTED BY MAINLAND)

圖則名稱 drawing title
工務計劃項目第 759TH 號
深港西部通道
PWP ITEM NO. 759TH
SHENZHEN WESTERN CORRIDOR

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設計 designed C.F.KU 07/01/03	繪圖 drawn M.K.LEUNG 07/01/03	圖則編號 drawing no. HMW6759TH-SP0003	比例 scale 1:30 000
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索引圖 比例 SCALE 1 : 300 000

圖例 LEGEND

	工程範圍 PROJECT LIMIT
	高架道路段 VIADUCT SECTION
	地面段 AT-GRADE SECTION

圖則名稱 drawing title
 工務計劃項目第736TH號
 后海灣幹線
 PWP ITEM NO.736TH
 DEEP BAY LINK

設計 designed C.F.KU <i>ky</i> 07/01/03	繪圖 drawn M.K.LEUNG 07/01/03	圖則編號 drawing no. HMW6736TH-SP0003	比例 scale 1:20 000
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Enclosure 4 to PWSC(2002-2003)80

759TH – Shenzhen Western Corridor

Breakdown of the estimate for consultants' fees (in September 2002 prices)

Consultants' staff costs			Estimated man-months	Average MPS* salary point	Multiplier	Estimated fee (\$ million)
(i)	Consultants' fees for - Construction supervision and contract administration (Note 2)	Professional				9.1
		Technical				7.5
(ii)	Resident site staff	Professional	934	38	1.6	86.3
		Technical	1 888	14	1.6	58.0
(iii)	EM&A programme	Professional	15	38	2.0	1.7
		Technical	34	14	2.0	1.3
(iv)	EMSTF charges				Sub-total	163.9
					Total	166.9

736TH – Deep Bay Link

Breakdown of the estimates for consultants' fees (in September 2002 prices)

Consultants' staff costs			Estimated man-months	Average MPS* Salary point	Multiplier	Estimated fee (\$ million)
(i)	Consultants' fees for - Construction supervision and contract administration (Note 2)	Professional				15.9
		Technical				10.4
(ii)	Resident site staff	Professional	1 880	38	1.6	173.7
		Technical	3 800	14	1.6	116.7
(iii)	EM&A programme	Professional	9	38	2.0	1.0
		Technical	20	14	2.0	0.8
(iv)	EMSTF charges				Sub-total	318.5
					Total	321.4

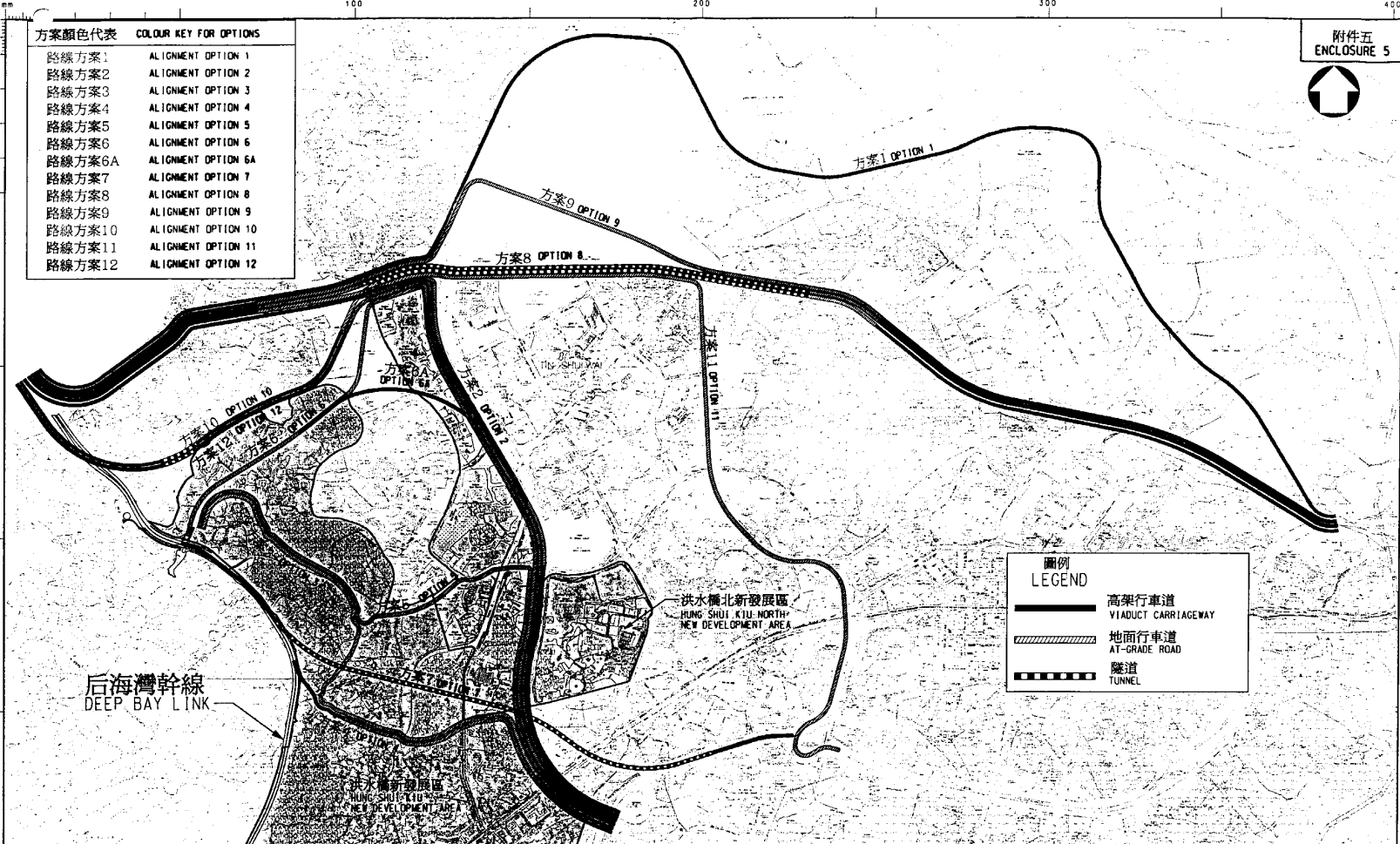
* MPS = Master Pay Scale

Notes

- (1) A multiplier of 2.0 is applied to the average MPS point to estimate the full staff costs including the consultants' overheads and profits, as the staff will be employed in the consultant's offices. A multiplier of 1.6 is applied to the average MPS in the case of resident site staff supplied by the consultants. (As at 1.10.2002, MPS pt. 38 = \$57,730 per month, and MPS pt. 14 = \$19,195 per month).
- (2) The consultants' fees for construction stage are estimated and will be controlled in accordance with the terms stipulated respectively in Agreement No. CE 56/2000 titled "Design and Construction Assignment for Deep Bay Link" and Agreement No. CE 51/2001 titled "Design and Construction Assignment for Shenzhen Western Corridor".



方案顏色代表	COLOUR KEY FOR OPTIONS
路線方案1	ALIGNMENT OPTION 1
路線方案2	ALIGNMENT OPTION 2
路線方案3	ALIGNMENT OPTION 3
路線方案4	ALIGNMENT OPTION 4
路線方案5	ALIGNMENT OPTION 5
路線方案6	ALIGNMENT OPTION 6
路線方案6A	ALIGNMENT OPTION 6A
路線方案7	ALIGNMENT OPTION 7
路線方案8	ALIGNMENT OPTION 8
路線方案9	ALIGNMENT OPTION 9
路線方案10	ALIGNMENT OPTION 10
路線方案11	ALIGNMENT OPTION 11
路線方案12	ALIGNMENT OPTION 12



圖例 LEGEND	
	高架行車道 VIADUCT CARRIAGEWAY
	地面行車道 AT-GRADE ROAD
	隧道 TUNNEL

圖則名稱 drawing title
東行連接路
EASTERLY LINK ROAD
路線方案
ALIGNMENT OPTIONS

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**Proposed Easterly Link Road (ELR)
An Analysis of the Six Shortlisted Options**

Option 1

The proposed ELR branches off from the southern end of the Shenzhen Western Corridor (SWC) and goes eastward to the junction of Tin Wah Road and Tin Ying Road. After it routes along the northern periphery of the new development at Tin Shui Wai (TSW), it goes through some fishponds at the northern part of Wang Chau and Nam Sang Wai before joining the Yuen Long Highway (YLH) at Au Tau.

2. As this route is long (about 10km) and tortuous, the construction cost and programme are expected to be high and long. Technical difficulty aside, the proposed route will affect many fishponds at the TSW north and Nam Sang Wai area and will encroach on the wetland conservation area, thus posing a very serious environmental problem. In addition, it is estimated that over 95% of the affected lands are private lots (around the area at Deep Bay Road, Sha Kong Tsuen, Fung Kong Tsuen and Wang Chau). Resumption will be extremely difficult.

Option 5

3. The proposed ELR spins off from Ha Tsuen Interchange, then routes through the planned roads of Hung Shui Kiu New Development Area (HSK NDA) as well as Ping Ha Road. After crossing the at-grade junction at Hung Tin Road/Ping Ha Road, it goes up the Hung Tin Road Flyover to cross Castle Peak Road, then uses the TSW West Interchange (TSWWI) to YLH.

4. This proposal is mainly at-grade, relatively less expensive and construction is relatively more straight forward. It is however a tortuous route with many junctions, hence the design speed can only be

50km/hour which may not be attractive to motorists (the traveling time using this route is expected to be four minutes more than using the main DBL route). Moreover, many private lots and container yards will be affected. The peripheral areas of both the HSK NDA and HSK North NDA will be affected.

Option 6

5. After spinning off from Ha Tsuen Interchange, this proposed route follows the alignment of the planned internal road of HSK NDA and it extends northwards to the junction of Tin Wah Road and Tin Ying Road. It then goes along Ting Ying Road and Hung Tin Road to reach YLH via the TSWWI.

6. This proposed route is mainly in the form of at-grade roads and there are no significant difficulties with construction. However, this route is tortuous with many junctions and hence may not be attractive to users (the traveling time using this route is expected to be about six minutes more than using the main DBL route). Furthermore, some private lots and container yards will be affected. This alignment will also impact extensively on the HSK North NDA along the northern periphery and Tin Ying Road, hence developments have to be set back.

Option 6A

7. This alignment is a modification of Option 6. After spinning off from Ha Tsuen Interchange, similar to Option 6, the proposed ELR follows the alignment of the planned internal road of HSK NDA; it then goes straight east and passes over Ping Ha Road and Tin Ying Road by a viaduct. It then goes along Tin Ying Road and Hung Tin Road to reach YLH via the TSWWI. This route is shorter than Option 6 by about one kilometre.

8. This is the preferred option having regard to engineering, environmental, lands, traffic and planning considerations. That said, the cost of construction is estimated to be about \$900 million while the saving in travelling time is about two minutes. Some private lots, container yards and fish ponds will be affected. There is also extensive

impact on the HSK North NDA.

Option 7

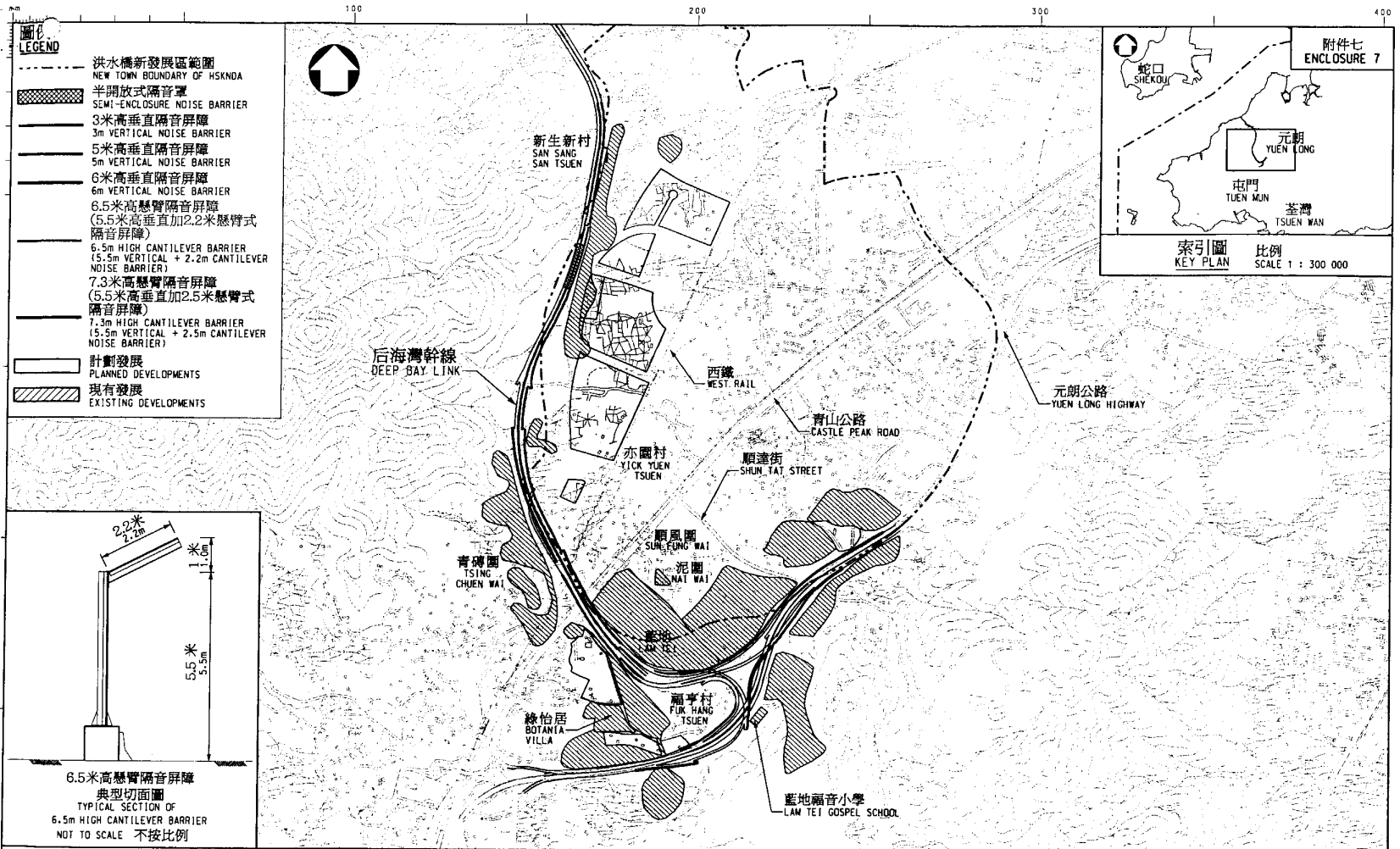
9. This proposed route is in the form of a tunnel joining the DBL mainline at San Sang San Tsuen and YLH near Tong Yan San Tsuen. The tunnel is aligned to avoid the impact on the foundations of the existing structures and planned developments by going through the various “Village”, “Green Belt” and low density development zones of HSK NDA.

10. While this option has relatively less impact on both the HSK and HSK North NDAs, it is very difficult to construct since the tunnel will have to be deep to pass the Light Right Transit track and has to be bored. The construction period is expected to take 60 months. Both the capital and recurrent costs, estimated to be about \$3,800 million and \$20 million per annum respectively, are high. In addition, there are significant land implications as a lot of private lots, industrial buildings, villages and graves will be affected. On the environment side, some fishponds will also be affected. The associated ventilation buildings will also be very close to the residential areas.

Option 8

11. This proposed route follows the alignment of Option 1 for the Deep Bay Road section, it then takes the form of a 2.6 kilometre dual two-lane cut and cover tunnel under Tin Wah Road and joins the YLH at Au Tau. This is a most direct connection heading towards Route 3.

12. Construction of the cut and cover tunnel underneath the existing large drainage channel in crossing Tin Ying Road will be extremely difficult and require a long construction period. Also, during the construction period, Tin Wah Road has to be closed to traffic completely which is unacceptable. Some mudflats, fishponds and private lots along Deep Bay Road as well as the northern periphery of the HSK North NDA will also be affected.



圖則名稱 drawing title
工務計劃項目第736TH號
后海灣幹線 - 隔音屏障的安裝位置
PWP ITEM NO. 736TH
DEEP BAY LINK - EXTENT OF NOISE BARRIERS

設計 designed C.F.KU <i>[Signature]</i> 07/01/03	繪圖 drawn M.K.LEUNG 07/01/03
覆核 checked C.F.KU <i>[Signature]</i> 07/01/03	批准 approved W.C.LAU <i>[Signature]</i> 07/01/03

主要工程管理處
MAJOR WORKS PROJECT MANAGEMENT OFFICE

圖則編號 drawing no. HMW6736TH-SP0004	比例 scale 1:15 000
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圖則名稱 drawing title

工務計劃項目第736TH號
 后海灣幹線 - 畫家筆下的隔音屏障
 PWP ITEM NO. 736TH
 DEEP BAY LINK - ARTISTIC IMPRESSION OF NOISE BARRIERS

設計 designed

C.F. AS
 08/01/03

繪圖 drawn

M.K. LEUNG
 08/01/03

圖則編號 drawing no.

HMW6736TH-SPO015

比例 scale

不按比例
 N.T.S.


覆核 checked

C.F. AS
 08/01/03

批准 approved

M.C. LAU
 08/01/03

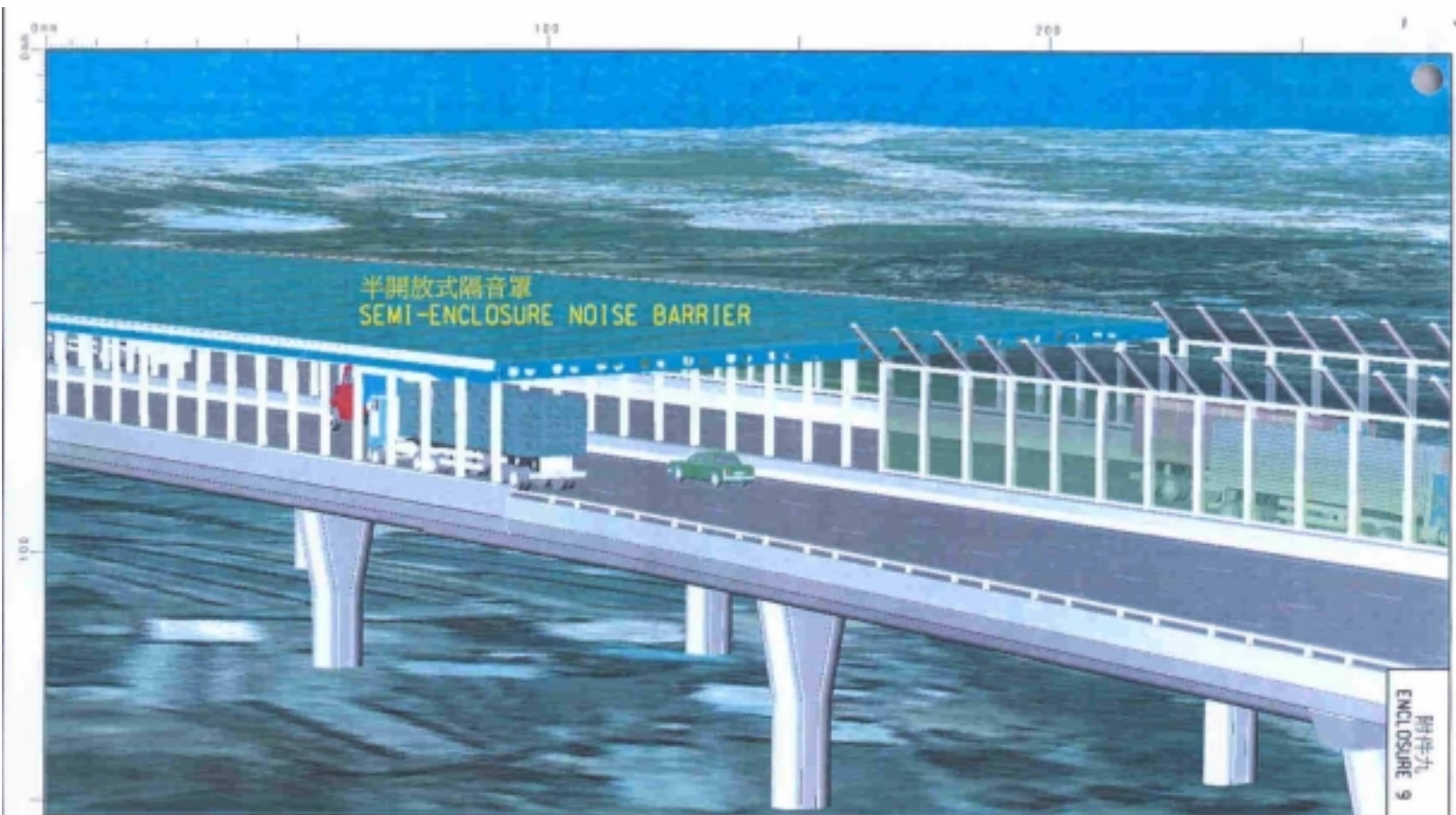
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附件九
ENCLOSURE 9

圖則名稱 drawing title

工務計劃項目第736TH號
 后海灣幹線 - 畫家筆下的半開放式隔音罩
 PWP ITEM NO. 736TH
 DEEP BAY LINK - ARTISTIC IMPRESSION OF SEMI-ENCLOSURES

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圖則編號 drawing no-
HMM6736TH-SP0016

比例 scale
不設比例
N.T.S.

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