

ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

HEAD 711 - HOUSING Territory Development Transport - Roads 643TH – Trunk Road T7 in Ma On Shan

Members are invited to recommend to Finance Committee the upgrading of **643TH** to Category A at an estimated cost of \$2,011.6 million in money-of-the-day prices.

PROBLEM

The existing road network in Ma On Shan (MOS) will not be able to cope with future traffic demand arising from the planned housing developments in the area.

PROPOSAL

2. The Director of Territory Development (DTD), with the support of the Secretary for Housing and Secretary for Transport, proposes to upgrade **643TH** to Category A at an estimated cost of \$2,011.6 million in money-of-the-day (MOD) prices for the construction of Trunk Road T7 in MOS.

PROJECT SCOPE AND NATURE

3. The scope of works for the proposed Trunk Road T7 comprises -

/ (a)

- (a) construction of a 3.2-kilometre (km) dual 2-lane carriageway between Heng On Estate and Cheung Muk Tau Village including 1.2 km of elevated bridge structures;
- (b) provision of a grade separated junction for connecting the proposed trunk road to Ma On Shan Road at Heng On Estate;
- (c) provision of a grade separated interchange in the form of underpass at the junction of the proposed trunk road with Sai Sha Road at Cheung Muk Tau;
- (d) construction of a 1.2km 2-lane carriageway linking MOS Road/Hang Hong Street roundabout with the existing access road to Ma On Shan Tsuen;
- (e) extension of Nin Fung Road as a re-provisioning of vehicular access to Cheung Muk Tau Village;
- (f) construction of a footbridge and three pedestrian subways;
- (g) associated road and drainage works, slope and landscaping works, road lighting and traffic control surveillance facilities;
- (h) provision of noise mitigation measures including 2 060 metres (m) of semi-enclosed noise barriers (5 to 10 m high) and 1 910 m of cantilever noise barriers (2 to 5 m high); and
- (i) implementation of an environmental monitoring and audit (EM&A) programme for the works mentioned in paragraphs (a) to (h) above.

The sites plans are at Enclosures 1 and 2.

/ **JUSTIFICATION**

JUSTIFICATION

4. The Sha Tin and Ma On Shan District Traffic Study (DTS) completed in March 1996 revealed that the developments at Sai Sha and Cheung Muk Tau would generate a significant volume of traffic passing through MOS. A number of new public and private housing developments are under construction in Areas 77 and 90 of MOS. Other housing sites at Lok Wo Sha and the proposed Lee On Station of the MOS Railway are scheduled for development in the next few years. With the on-going population intake associated with these developments, we estimate the population in MOS will increase from the present population of 174 000 to 238 000 in 2006, and will further increase to 266 000 in 2011. The existing road network in MOS will therefore not be able to cope with the traffic demand arising from the planned residential developments in the area.

5. In December 1997, the Administration commissioned the Kowloon-Canton Railway Corporation (KCRC) to construct the 11km MOS Railway between Lee On in MOS and Tai Wai in Sha Tin. KCRC plans to start the construction works in 2000 for completion in 2004. Taking into account the MOS Railway and the latest projected population intake in MOS, we updated the traffic demand forecast and completed a review of the DTS in June 1999. The review confirmed that the existing road network in MOS would not be able to cope with the future traffic demand arising from the planned developments in MOS, Sai Sha and Cheung Muk Tau. The review also confirmed the need for the proposed Trunk Road T7 to provide a by-pass to accommodate through traffic between Sha Tin, Sai Sha and the Northern part of MOS. The review indicated that a number of road junctions in MOS, particularly, those at Hang Hong Street/MOS Road roundabout, MOS Road/Sai Sha Road and Sai Sha Road/Hang Hong Street, would not be able to cope with the growing traffic demand. Without the proposed Trunk Road T7, all these road junctions will be operating beyond their design capacity by 2006 as shown in the following table -

Junction	Junction performance without Trunk Road T7 in Year			Junction performance with Trunk Road T7 in Year		
	2001	2006	2011	2001	2006	2011
Hang Hong Street/ MOS Road Roundabout Junction ¹	0.69	1.40	1.49	0.69	0.86	0.90

/ MOS

¹ The performance of a roundabout junction is indicated by its "Design Flow/Capacity" (DFC) ratio. A roundabout with DFC greater than 1.0 implies that the junction is overloaded.

Junction	Junction performance without Trunk Road T7 in Year			Junction performance with Trunk Road T7 in Year		
	2001	2006	2011	2001	2006	2011
MOS Road/ Sai Sha Road Signal Junction ²	42%	-70%	-72%	42%	6%	5%
Sai Sha Road/Hang Hong Street Signal Junction	68%	-49%	-51%	68%	14%	8%

With the proposed trunk road in place, the projected journey time from Tai Shui Hang (near the western junction of MOS Road/Sai Sha Road) to Cheung Muk Tau (the eastern junction of MOS Road/Sai Sha Road near to Lee On Station) during evening peak hours in 2006 will be reduced from 20.5 minutes to 5.2 minutes.

6. To relieve traffic congestion on the local roads in MOS and to cater for the traffic flow generated by the residential developments at Sai Sha, we plan to start the construction of the proposed Trunk Road T7 in November 2000 for completion in August 2004.

FINANCIAL IMPLICATIONS

7. We estimate the capital cost of the project to be \$2,011.6 million in MOD prices (see paragraph 8 below), made up as follows –

	\$ million
(a) Earthworks and retaining structures	107.0
(b) Roadworks	97.0
(c) Elevated bridge structures	500.0

/ (i)

² The performance of a traffic signal junction is indicated by its “Reserved Capacity” (RC). A negative RC indicates that the junction is overloaded, thus resulting in traffic queues and longer delay time.

	\$ million	
(i) foundations	127.0	
(ii) substructures	41.0	
(iii) superstructures	332.0	
(d) Underpasses	140.0	
(e) One footbridge and three pedestrian subways	46.0	
(f) Drainage works	54.0	
(g) Road lighting and traffic control surveillance facilities	27.0	
(h) Landscaping works	53.0	
(i) Noise mitigation measures	386.0	
(i) Semi-enclosed noise barriers	292.0	
(ii) Cantilever noise barriers	94.0	
(j) EM&A programme	8.0	
(k) Consultants' fees for -	175.0	
(i) construction stage	20.0	
(ii) site staff costs	155.0	
(l) Contingencies	159.0	
	<hr/>	
Sub-total	1,752.0	(in December 1999 prices)

/ (m)

	\$ million
(m) Provision for price adjustment	<u>259.6</u>
Total	2,011.6 (in MOD prices)
	<u> </u>

Owing to insufficient in-house resources, DTD proposes to employ consultants to carry out the construction supervision. A breakdown by man months of the estimate for the consultants' fees is at Enclosure 3.

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

Year	\$ million (Dec 1999)	Price adjustment factor	\$ million (MOD)
2000 - 2001	80.0	1.00000	80.0
2001 – 2002	370.0	1.04500	386.7
2002 – 2003	370.0	1.10770	409.8
2003 – 2004	430.0	1.17416	504.9
2004 – 2005	430.0	1.24461	535.2
2005 – 2006	72.0	1.31929	95.0
	<u>1752.0</u>		<u>2011.6</u>

9. We have derived the MOD prices on the basis of the Government's forecast of trend labour and construction prices for the period 2000 to 2006. We will tender the proposed works under a standard remeasurement contract because the works involve extensive earthworks and foundation works, the quantities of which may vary depending on the actual ground conditions. We will provide for price adjustment as the contract will exceed 21 months.

10. We estimate the additional annually recurrent expenditure to be \$30.7 million.

PUBLIC CONSULTATION

11. We consulted the Traffic and Transport Committee of Sha Tin District Board on 10 March 1997. Members supported the project. On 24 February 1998, we consulted the Development and Housing Committee of the Sha Tin Provisional District Board on the findings of the Environmental Impact Assessment (EIA) study. Members supported the project but requested Government to limit the noise level for the operation of Trunk Road T7 to 67dB, i.e. 3dB below the standard of 70dB. We subsequently wrote to the Sha Tin Provisional District Board explaining that we could not apply differential noise standards to certain noise sensitive receivers as this would create a different level of noise abatement among residents and would lead to confusion in the application of standards.

12. We consulted the Traffic and Transport Committee of the Tai Po Provisional District Board on the proposed road scheme on 14 May 1998. Members supported the project. We also consulted the Sai Kung North Rural Committee together with the Village Representative of Cheung Muk Tau Village on the proposed works on 27 July 1998. Members accepted the proposed road scheme.

13. We gazetted the road scheme under the Roads (Works, Use and Compensation) Ordinance on 9 April 1999 and received seven objections. Six objectors were concerned about the noise, air quality and visual impacts from the operation and construction of the road scheme. We explained the details of the project to the objectors as well as the proposed environmental mitigation measures. Four of them then withdrew their objections. The remaining two were still not satisfied that the proposed noise mitigation measures would mitigate the noise from the proposed Trunk road T7 to acceptable levels within the Hong Kong Planning and Standards Guidelines (HKPSG) limits. They therefore maintained their objections. The seventh objector requested Government to construct an access road to the burial ground of Wu Kai Sha Village. We explained that the proposed access road was not supported by the various departments concerned due to anticipated low usage and a hazardous junction layout. Nevertheless, the objector maintained his objection. On 28 March 2000,

the Chief Executive in Council overruled the objections in the public interest and authorized the road scheme with modifications. The modifications included the provision of semi-enclosed noise barriers in certain sections of the road and additional cantilever noise barriers at Cheung Muk Tau.

ENVIRONMENTAL IMPLICATIONS

14. The project is a designated project under Schedule 2 of the Environmental Impact Assessment (EIA) Ordinance and an Environmental Permit is required for the construction and operation of the project. In March 1998, the Advisory Council on the Environment endorsed the EIA report without any condition. In January 2000, we reviewed the EIA report in line with the latest traffic forecasts. The review covered changes since the approval of the EIA report and concluded that the original findings and conclusions were still valid. We have obtained an environmental permit for the project under the EIA Ordinance. We will implement the measures recommended in the approved EIA report and the review.

15. The key environmental measures include the replanting of trees and the provision of direct noise mitigation measures. To compensate for the loss of 5 hectares of woodland, we will plant trees and shrubs on all disturbed and new slopes with screen planting along the roadside and interchange areas covering a total landscaping area of about 6.5 hectares. The direct noise mitigation measures include 1 910m of cantilever noise barriers (2m to 5m high) and 2 060m of semi-enclosed noise barriers (5m to 10m high) to abate traffic noise. The review also confirmed that the project would comply with the Air Quality Objectives established under the Air Pollution Control Ordinance. We will incorporate into the relevant contracts standard measures to control pollution arising during construction. These measures will include frequent watering of the site and the provision of wheel-washing facilities to reduce emission of fugitive dust, the use of silenced construction plant to reduce noise generation and other procedures as recommended in Environmental Protection Department's Recommended Pollution Control Clauses. We have included the costs of landscaping works (\$53 million), noise mitigation measures (\$386 million) and an EM&A programme (\$8 million) in the overall project estimate.

16. At the planning and design stages, we have considered optimising the road levels and the formation levels of the landscaping areas to reduce the generation of construction and demolition material (C&DM) as much as possible. We estimate that about 387 000 cubic metres of C&DM will be generated, of which about 7 000 cubic metres of C&D waste will be disposed of at landfills. All the remaining 380 000 cubic metres public fill will be reused as filling material within the project area.

17. Under the terms of the contract, we will require the contractor to submit a waste management plan for approval setting out waste avoidance and reduction measures, including the allocation of an area for waste segregation on site to facilitate reuse/recycling of C&DM. We will ensure that the day-to-day operations on site comply with the approved waste management plan. We will require the contractor to implement necessary measures to minimise the generation of C&DM and to reuse and recycle C&DM. To further minimise the generation of C&DM, we will encourage the contractor to use non-timber materials for formwork, hoarding and other temporary works. We will control the disposal of public fill and C&D waste to designated public filling areas and landfills respectively through a trip-ticket system. We will record the disposal, reuse and recycle of C&DM for monitoring purposes.

LAND ACQUISITION

18. We will resume about 930 square metres of agricultural land under the road scheme authorized by the Chief Executive in Council. The land acquisition and clearance will affect two households involving two persons. The Director of Housing will offer eligible clearerees accommodation in public housing in accordance with the existing housing policy. We will charge the cost of land acquisition and clearance, estimated at \$4.82 million, to Head **701** – Land Acquisition.

BACKGROUND INFORMATION

19. We upgraded **643TH** to Category B in September 1996. In January 1997 we engaged consultants to undertake the EIA and traffic impact assessment studies for the project and charged the cost of \$2.4 million to Subhead **B100HX** “Minor housing development related works, studies and investigations for items in Category D of the Public Works Programme”. In September 1997 we engaged consultants to undertake the preliminary design for Trunk Road T7 and charged the cost of \$2.6 million to the same Subhead.

20. In September 1998, we upgraded part of **643TH** to Category A as **648TH** “Trunk Road T7 in Ma On Shan – detailed design and site investigations” at an estimated cost of \$66.7 million in MOD prices for engaging consultants to carry out the site investigation and detailed design of the project. The consultants have completed the site investigation, detailed design and drawings for the proposed works.

21. We submitted a paper (referenced PWSC(2000-01)34) to the Public Works Subcommittee (PWSC) on 24 May 2000 proposing to upgrade the project to Category A. At the meeting, Members requested additional information on traffic figures for the existing Sai Sha Road and Ma On Shan Road, and the proposed Trunk Road T7 at present and in year 2006. Members also queried the adequacy of the proposed cantilever noise barriers at three sections of the Trunk Road T7 (near Heng On Estate, Kam Ying Court and Symphony Bay) given that semi-enclosed noise barriers had been proposed at other sections of the road. The Administration withdrew the paper pending provision of the requested information and clarification.

22. In response to Members’ request, the relevant traffic figures, expressed in volume/capacity (V/C) ratios³, are shown in the following table –

	Present	Year 2006
Sai Sha Road (Town Centre Section)	0.36	0.44
MOS Road (Town Centre Section)	0.64	0.76
Proposed Trunk Road T7	-	0.73

23. Regarding the adequacy of the proposed cantilever noise barriers, we have submitted a separate information paper (ref. HB 12/2/5) to Members to elaborate on the noise impact assessment for the trunk road T7 project. We have explained in the paper that as a matter of practice we calculate whether the noise levels at the relevant Noise Sensitive Receivers (NSRs) would exceed the noise

/ standard

³ A V/C ratio equal to or less than 1.0 means that the road has sufficient capacity to cope with the volume of vehicular traffic under consideration. A V/C ratio above 1.0 indicates the onset of mild congestion, above 1.2 indicates more serious congestion with traffic speeds progressively deteriorating with further increase in traffic.

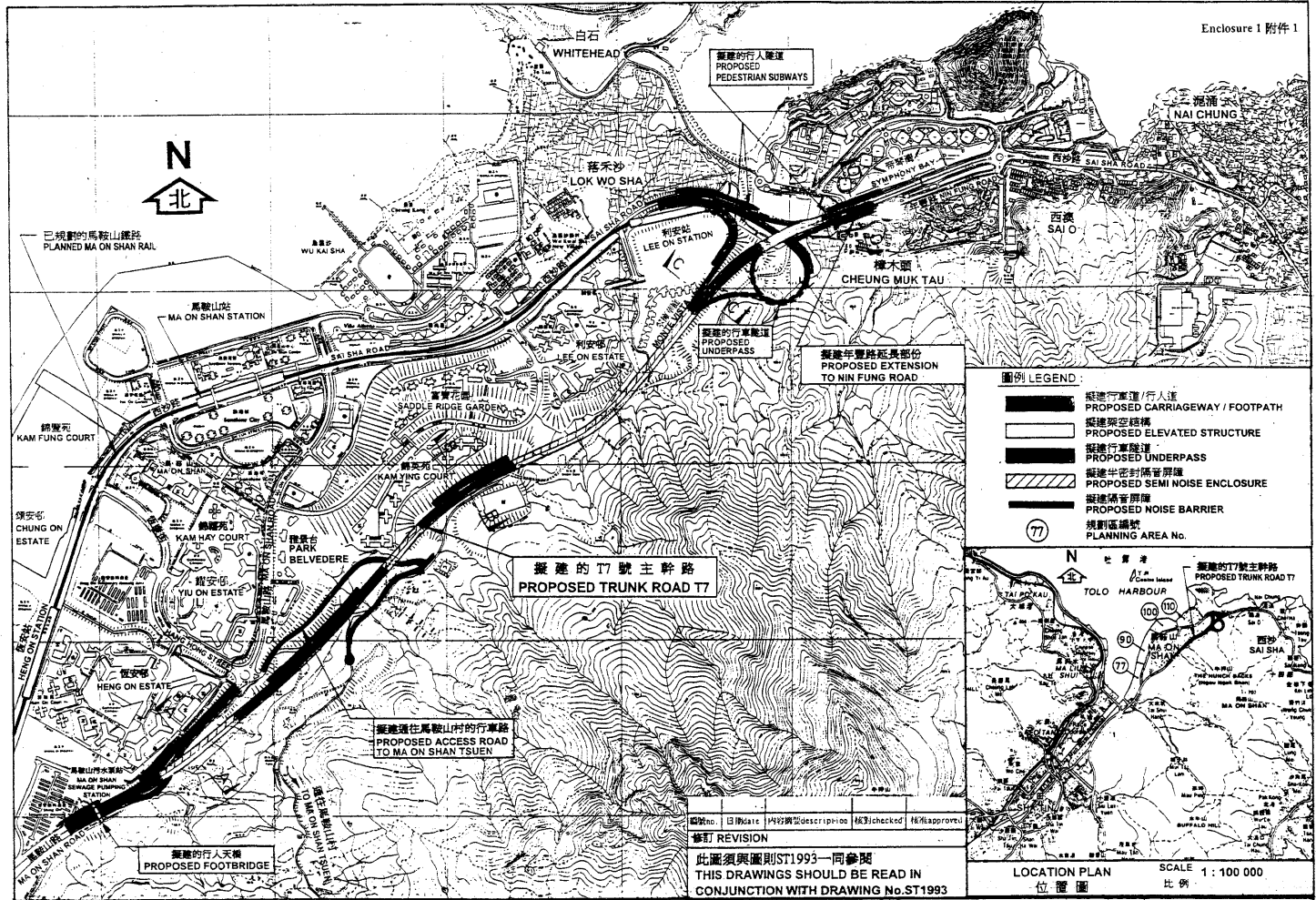
standard of 70 dB specified in the HKPSG for domestic premises if we construct cantilever noise barriers. If the noise levels at a certain NSR exceed the noise standard, we would then adopt semi-enclosed noise barriers at that particular section of the proposed road. As regards the three road sections concerned, noise calculations show that the proposed cantilever noise barriers would already suffice to contain noise generated by the proposed T7 to levels within the HKPSG standards. Accordingly, semi-enclosed noise barriers are not necessary. If semi-enclosed noise barriers were constructed for these three sections, the construction cost would increase by \$50 million, from \$30.6 million to \$80.5 million. We have arranged an informal meeting on 2 June 2000 with Members for further clarification.

24. We have also deposited a copy each of the Environmental Impact Assessment Report (February 1998) and the Environmental Review (March 2000) with the Clerk to LegCo for Members' inspection.

25. To minimise traffic disruption during construction, we will carry out temporary traffic diversion arrangements as and when necessary.

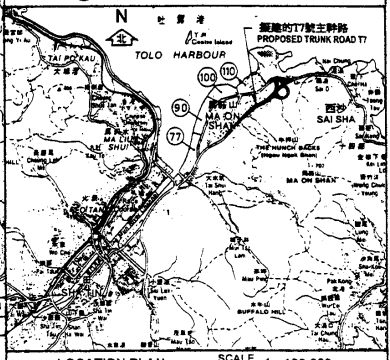
26. We estimate that the project will provide some 970 jobs totalling 43 650 man months comprising 38 professional/managerial staff, 122 technical/ancillary staff and 810 labourers.

Housing Bureau
May 2000



圖例 LEGEND:

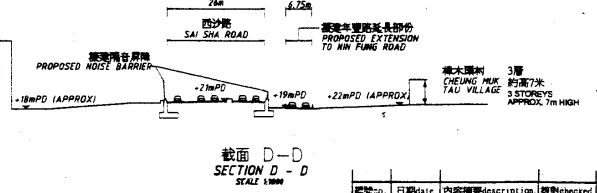
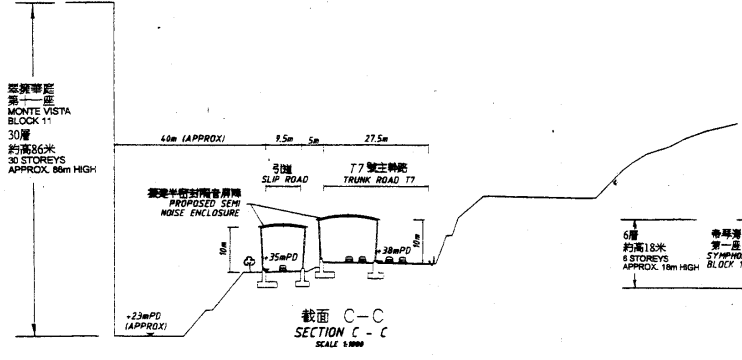
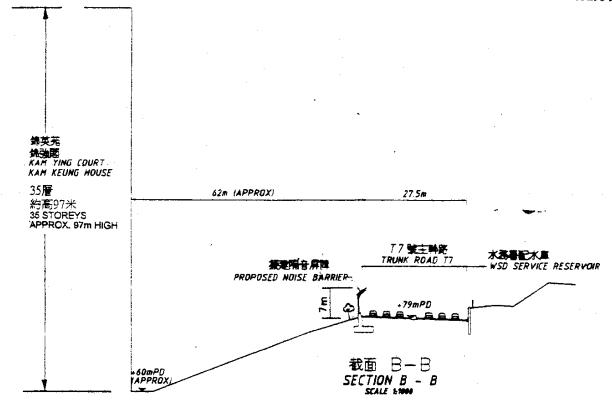
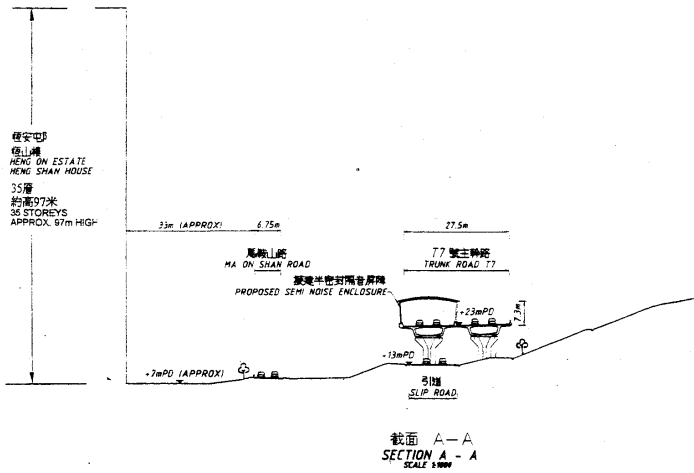
	擬建行車道/行人道 PROPOSED CARRIAGEWAY / FOOTPATH
	擬建架空結構 PROPOSED ELEVATED STRUCTURE
	擬建行車隧道 PROPOSED UNDERPASS
	擬建半密封隔音屏障 PROPOSED SEMI NOISE ENCLOSURE
	擬建隔音屏障 PROPOSED NOISE BARRIER
	規劃區編號 PLANNING AREA No.



編號 no.	日期 date	內容/說明 description	核對 checked	核准 approved
修訂 REVISION				
此圖須與圖則ST1993一同參閱 THIS DRAWINGS SHOULD BE READ IN CONJUNCTION WITH DRAWING No. ST1993				

二〇〇〇至二〇〇一年度工務小組委員會文件 P.W.S.C. SUBMISSION 2000-2001

圖則名稱 drawing title	繪圖 drawn	簽署 initial	日期 date	比例 scale	辦事處 office
	核對 checked	簽署 initial	日期 date		
馬鞍山 T7 號主幹路 TRUNK ROAD T7 IN MA ON SHAN	核對 checked	簽署 initial	日期 date	圖則編號 drawing no.	新界東拓展處 NT EAST DEVELOPMENT OFFICE
	核准 approved	簽署 initial	日期 date		



編號No.	日期date	內容描述description	核對checked	核准approved
修訂 REVISION				
此圖須與圖則ST1991一同參閱 THIS DRAWINGS SHOULD BE READ IN CONJUNCTION WITH DRAWING No. ST1991				

二〇〇〇至二〇〇一年度工務小組委員會文件 P.W.S.C. SUBMISSION 2000-2001

圖則名稱 drawing title

馬鞍山T7號主幹路 - 截面圖

TRUNK ROAD T7 IN MA ON SHAN - SECTIONS

繪圖 drawn W. K. CHUI	簽署 initial <i>W. K. CHUI</i>	日期 date 2.2.2000	比例 scale 1:1 000	辦事處 office 新界東拓展處 NT EAST DEVELOPMENT OFFICE
核對 checked W. H. KWAN	簽署 initial <i>W. H. KWAN</i>	日期 date 2.2.2000	圖則編號 drawing no. ST1993	拓展署 TERRITORY DEVELOPMENT DEPARTMENT
核准 approved W. TSUI	簽署 initial <i>W. TSUI</i>	日期 date 2.2.2000		

643TH – Trunk Road T7 in Ma On Shan

Breakdown of estimate for consultants' fees

Consultants' staff costs			Estimated man months	Average MPS* salary point	Multiplier factor	Estimated fee (\$ million)
(a)	Consultants' fees for construction stage					
(i)	contract administration	Professional Technical	104 56	40 16	2.4 2.4	15.7 2.8
(ii)	preparation of as-built drawings	Professional Technical	4 18	40 16	2.4 2.4	0.6 0.9
(b)	Resident site staff costs	Professional Technical	651 2394	40 16	1.7 1.7	69.5 85.5
Total consultants' staff costs						175.0

* MPS = Master Pay Scale

Notes

1. A multiplier factor of 2.4 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 factor of 1.7 is applied to the average MPS point in the case of resident site staff supplied by the consultants. (At 1.4.99, MPS pt. 40 = \$62,780 p.m. and MPS pt. 16 = \$21,010 p.m.)
2. The figures given above are based on estimates prepared by the Director of Territory Development. The consultancy works for this project have been included as part of an existing consultancy agreement for the development of Sha Tin New Town (Stage 2). We will only know the actual man months and fees when we have appointed the resident site staff.

