

## **ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE**

**HEAD 707 - NEW TOWNS AND URBAN AREA DEVELOPMENT**  
**New Territories East Development**  
**Civil Engineering – Land development**  
**277CL – Tseung Kwan O development, phase II, remaining engineering  
works**

Members are invited to recommend to Finance  
Committee –

- (a) the upgrading of part of **277CL**, entitled "Grade-separated interchange T1/P1/P2, Tseung Kwan O", to Category A at an estimated cost of \$456 million in money-of-the-day prices; and
- (b) the retention of the remainder of **277CL** in Category B.

### **PROBLEM**

The existing at-grade roundabout at the junction of Tseung Kwan O Tunnel Road (Road T1)/Wan Po Road (Road P1)/Po Shun Road (Road P2) will not be able to cope with future traffic demand arising from the planned developments of Tseung Kwan O (TKO) New Town.

**/PROPOSAL .....**

## PROPOSAL

2. The Director of Territory Development (DTD), with the support of the Secretary for Planning and Lands, proposes to upgrade part of **277CL** to Category A at an estimated cost of \$456 million in money-of-the-day (MOD) prices for the construction of a grade-separated interchange at the junction of Tseung Kwan O Tunnel Road/Wan Po Road/Po Shun Road.

## PROJECT SCOPE AND NATURE

3. The scope of **277CL** covers engineering works associated with the phase 2 development of TKO. Finance Committee has previously approved the upgrade of parts of **277CL** to Category A (see paragraph 26 below). The remaining works under **277CL** comprise reclamation in Area 51 and provision of roads, interchange, flyovers, footbridge, noise mitigation measures and associated drainage, sewerage and landscaping works as set out in the site plan at Enclosure 1.

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4. The scope of the part of **277CL** we now propose to upgrade to Category A comprises -

- (a) construction of a 352-m 2-lane vehicular bridge connecting the westbound carriageway of Road P2 and the northbound carriageway of Road T1 (denoted as Bridge A);
- (b) construction of a 29-m 2-lane northbound and 3-lane southbound vehicular bridge connecting Road T1 and Road P1 (denoted as Bridge B);
- (c) construction of a 159-m single-lane vehicular bridge connecting the southbound carriageway of Road T1 and the westbound carriageway of Road P2 (denoted as Bridge C);
- (d) widening of an existing 34-m vehicular bridge to provide an additional lane for the northbound traffic of Road T1 over Wan Lung Road (denoted as Bridge D);
- (e) widening, realignment and reconstruction of Road T1, Road P1, Road P2 and associated slip roads leading to/from Road T1;
- (f) construction of a pedestrian subway and extension of two existing pedestrian/cycle subways across Road P2;

/(g) .....

- (g) associated works including construction of footpaths, cycle tracks, drainage and landscaping works, and provision of traffic control and surveillance facilities;
- (h) provision of noise mitigation measures including low noise road surfacing, 120 m of full enclosure (10 m high), 780m of cantilever noise barriers (5.5 m high) and 265m of vertical noise barrier (5m high); and
- (i) implementation of an environmental monitoring and audit (EM&A) programme for the works mentioned in paragraphs (a) to (h) above.

----- Details of the proposed works are shown at Enclosures 2, 3 and 4. We plan to start the construction works in October 2001 for completion in October 2004.

5. We will implement the remainder of **277CL**, to be retained in Category B of the Public Works Programme, in stages starting from early 2003 for completion in early 2010.

## JUSTIFICATION

6. With the on-going population intake associated with the developments in TKO, we estimate that the population in TKO will increase from the present population of 270 000 to 390 000 in 2006, and will further increase to 490 000 in 2011. The existing T1/P1/P2 roundabout junction will not be able to cope with the traffic demand generated from the planned developments in the area.

7. The proposed works can help to relieve the traffic congestion and queuing problem at the roundabout junction. According to the traffic impact assessment conducted for this project in early 1998 and the latest traffic forecast, the roundabout is at present operating at its capacity and will be heavily overloaded in 2011 despite the opening of the MTR Tseung Kwan O Extension in 2002. The projected design flow/capacity (DFC) ratio<sup>1</sup> of the existing roundabout during peak hours is given in the following table and the effects are described in paragraph 8 below -

/DFC .....

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<sup>1</sup> Design flow/capacity (DFC) ratio is an indicator which reflects the performance of a roundabout junction. A DFC ratio equal to or less than 1.0 means that the roundabout junction has sufficient capacity to cope with the volume of vehicular traffic and the traffic will flow smoothly. A DFC ratio above 1.0 indicates the onset of congestion; above 1.2 indicates more serious congestion with traffic speeds progressively deteriorating with further increases in traffic.

	DFC ratio
Year	Without proposed roadworks
2001	1.08
2006	1.00 <sup>2</sup>
2011	1.44

8. The problem of the junction at present is reflected by the queuing on the westbound lane of Road P2 and the northbound lane of Road P1, where vehicles have difficulty entering the roundabout from the approach roads. The problem is expected to further deteriorate with the growth in traffic. The proposed works can greatly improve the vehicular movement as the traffic to/from Kowloon can flow freely via the proposed vehicular bridges A, B and C.

9. After the completion of the grade-separated interchange, the performance of the road junction can be measured by the volume/capacity (v/c) ratio<sup>3</sup>. The worst projected v/c ratios of the connecting approach roads to the grade-separated interchange T1/P1/P2 during peak hours, based on the latest traffic forecast, are set out below -

	v/c ratio
Year	With proposed roadworks
2006	0.93
2011	0.70 <sup>4</sup>

## FINANCIAL IMPLICATIONS

10. We estimate the capital cost of the project to be \$456 million in MOD prices (see paragraph 11 below), made up as follows –

### \$ million

(a) Earthworks 20.4

/(b) .....

<sup>2</sup> The projected DFC ratio would improve as a result of the opening of the MTR Tseung Kwan O Extension in 2002.

<sup>3</sup> Volume/capacity (v/c) ratio is an indicator which reflects the performance of a road. 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 and the traffic will flow smoothly. A v/c ratio above 1.0 indicates the onset of congestion; above 1.2 indicates more serious congestion with traffic speeds progressively deteriorating with further increases in traffic.

<sup>4</sup> The projected v/c ratio assumes the completion of Western Coast Road by 2011, which is now being planned.

	<b>\$ million</b>	
(b) Roadworks with associated footpaths and cycle tracks	49.4	
(c) Vehicular bridges	103.7	
(d) Pedestrian subways	2.4	
(e) Drainage works	12.4	
(f) Traffic control and surveillance facilities	18.0	
(g) Landscaping works	7.5	
(h) Noise mitigation measures	117.9	
(i) noise enclosure	58.9	
(ii) noise barriers	56.8	
(iii) low noise road surfacing	2.2	
(i) EM&A programme	8.3	
(j) Consultants' fees for	40.0	
(i) Construction stage	5.1	
(ii) Site staff costs	34.9	
(k) Contingencies	38.0	
Sub-total	418.0	(in September 2000 prices)
(l) Provision for price adjustment	38.0	
Total	456.0	(in MOD prices)

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 5.

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

<b>Year</b>	<b>\$ million (Sept 2000)</b>	<b>Price adjustment factor</b>	<b>\$ million (MOD)</b>
2001 – 2002	11.0	1.02550	11.3
2002 – 2003	125.0	1.05627	132.0
2003 – 2004	132.0	1.08795	143.6
2004 – 2005	125.0	1.12059	140.1
2005 – 2006	20.0	1.15421	23.1
2006 – 2007	5.0	1.18884	5.9
	418.0		456.0

12. We have derived the MOD estimate on the basis of the Government's latest forecast of trend labour and construction prices for the period from 2001 to 2007. We will tender the proposed works under a standard remeasurement contract because the works involve extensive foundation works, the quantities of which may vary depending on the actual ground conditions. The contract will provide for price adjustments because the contract period will exceed 21 months.

13. We estimate the annually recurrent expenditure arising from this project to be \$3.78 million.

## **PUBLIC CONSULTATION**

14. We consulted the Traffic and Transport Committee (T&TC) of the then Sai Kung Provisional District Board (SKPDB) on the proposed works on 25 August 1999. The Committee supported the proposal and urged the Government to implement the works as soon as possible.

15. We gazetted the road scheme under Roads (Works, Use and Compensation) Ordinance on 3 February 2000. We briefed the Tseung Kwan O (South) Area Committee on the proposed works on 23 February 2000 together with the representatives from On Ning Garden, Chung Ming Court and King Lam Estate. Some members were concerned about the location, design and environmental impacts of Bridge C. We explained the details of the project and the proposed environmental mitigation measures to the members. We also informed them that the temporary traffic management scheme would include measures to ensure that all existing pedestrian subways and adjacent footpaths would remain open during construction of the works.

16. At the end of the objection period of the gazette notice, we received two objections. The objectors were concerned about the environmental impacts, in particular noise from the operation of the road scheme and the close proximity of Bridge C to On Ning Garden. We explained to the objectors details of the project and the proposed environmental mitigation measures. They were not satisfied with our explanation and refused to withdraw their objections. To review the noise impact assessment (NIA) in line with the latest traffic forecasts, we completed a supplementary NIA study in November 2000, which recommended the provision of further noise mitigation measures. One of the objectors eventually withdrew her objection after we proposed to enhance the noise mitigation measures. The remaining objector refused to withdraw the objection.

17. On 20 February 2001, the Chief Executive in Council overruled the objections on grounds of public interest and authorized the road scheme with modifications. The modifications include provision of additional noise barriers along the central median of Wan Po Road and upgrading of the noise barriers along the southbound verge of Wan Po Road and along Bridge C.

18. On 2 April 2001, the LegCo Panel on Planning, Lands and Works discussed and supported the proposed works.

## **ENVIRONMENTAL IMPLICATIONS**

19. The project is a designated project under Schedule 2 of the Environmental Impact Assessment (EIA) Ordinance and an Environmental Permit (EP) is required for the construction and operation of the project.

20. In October 1999, the EIA report for the project was approved under the EIA Ordinance which concluded that the environmental impacts of the project could be controlled to within the requirements of the EIA Ordinance and its Technical Memorandum. An EP was issued in August 2000 under the EIA Ordinance for the construction and operation of the project. The key mitigation measures as recommended in the approved EIA report include -

- (a) noise enclosure/barriers and low noise road surfacing at appropriate sections of new roads of the project. These measures will reduce the noise level at a total of 2 690 dwellings and 130 classrooms by 1 dB(A) up to a maximum of 22 dB(A);
- (b) dense tree and shrub planting, re-instatement of street planting and consideration of design and materials for enhancing the visual and landscape quality; and
- (c) an environmental monitoring and audit programme.

21. To address the concerns of the objectors of the road scheme gazetted on 3 February 2000, a supplementary NIA study completed in November 2000 recommended enhancing the existing noise barriers along the section of Wan Po Road in front of Nam Fung Plaza and On Ning Garden and the recommended noise barrier on Bridge C. The NIA study confirmed that the enhanced noise mitigation measures could bring the noise levels at all dwellings in Nan Fung Plaza affected by the existing Wan Po Road to full compliance with the noise standard of 70 dB(A) or less. Moreover, the enhanced noise mitigation measures would further reduce the noise levels at 336 dwellings in Nan Fung Plaza up to 13 dB(A) and the noise levels at 273 dwellings in On Ning Garden up to 6 dB(A). We have submitted our application for a variation to the current EP in respect of the enhanced noise mitigation measures in April 2001.

22. We will incorporate into the relevant contract standard measures to control pollution arising during construction. These measures will include frequent watering of the site, the provision of wheel-washing facilities and covering of materials on trucks to reduce emission of dust, the use of silenced construction plant and siting of equipment and mobile noise barriers for controlling construction noise and other procedures as recommended in Environmental Protection Department's Recommended Pollution Control Clauses. We have included the costs of landscaping works (\$7.5 million in September 2000 prices), noise mitigation measures (\$117.9 million) and an EM&A programme (\$8.3 million) in the overall project estimate.



23. At the planning and design stages, we have considered optimizing the road levels and the formation levels of the landscaping areas to reduce the generation of construction and demolition (C&D) materials as much as possible. We estimate that about 55 000 cubic metres (m<sup>3</sup>) of C&D materials will be generated, of which about 45 000 m<sup>3</sup> (82%) will be reused on site and the remaining 10 000 m<sup>3</sup> (18%) of C&D waste will be disposed of at landfills.

24. We will require the contractor under the contract to submit a waste management plan to the Engineer for approval, with appropriate mitigation measures, including the allocation of an area for waste segregation. We will ensure that the day-to-day operations on site comply with the approved plan. To further minimise the generation of C&D materials, we will minimise carriageway reconstruction by resurfacing, use precast concrete paving blocks for footpaths and encourage the contractor to use non-timber materials for formwork, hoarding and other temporary works. We will require the contractor to implement necessary measures set out in the Recommended Pollution Control Clauses for Construction Contracts issued by EPD to minimise the generation of C&D materials and to reuse and recycle C&D materials. We will control the disposal of C&D waste to designated landfills through a trip-ticket system. We will record the disposal, reuse and recycling of C&D materials for monitoring purposes.

## LAND ACQUISITION

25. The proposed works do not require any land acquisition or clearance.

## BACKGROUND INFORMATION

26. We upgraded **277CL** to Category B in April 1988. Since then, Finance Committee has approved the upgrading of various parts of **277CL** to Category A for the reclamation of 79 hectares of land at TKO town centre, the provision of engineering infrastructure at TKO town centre north and TKO town centre central and widening of Wan Po Road as detailed below –

Upgrade to Cat A	Project (Approved Project Estimate)	Start date	Completion date
Dec 1989	<b>337CL</b> TKO development, phase II, stage II, engineering works (\$110 million)	June 1990	Feb 1995

/June .....

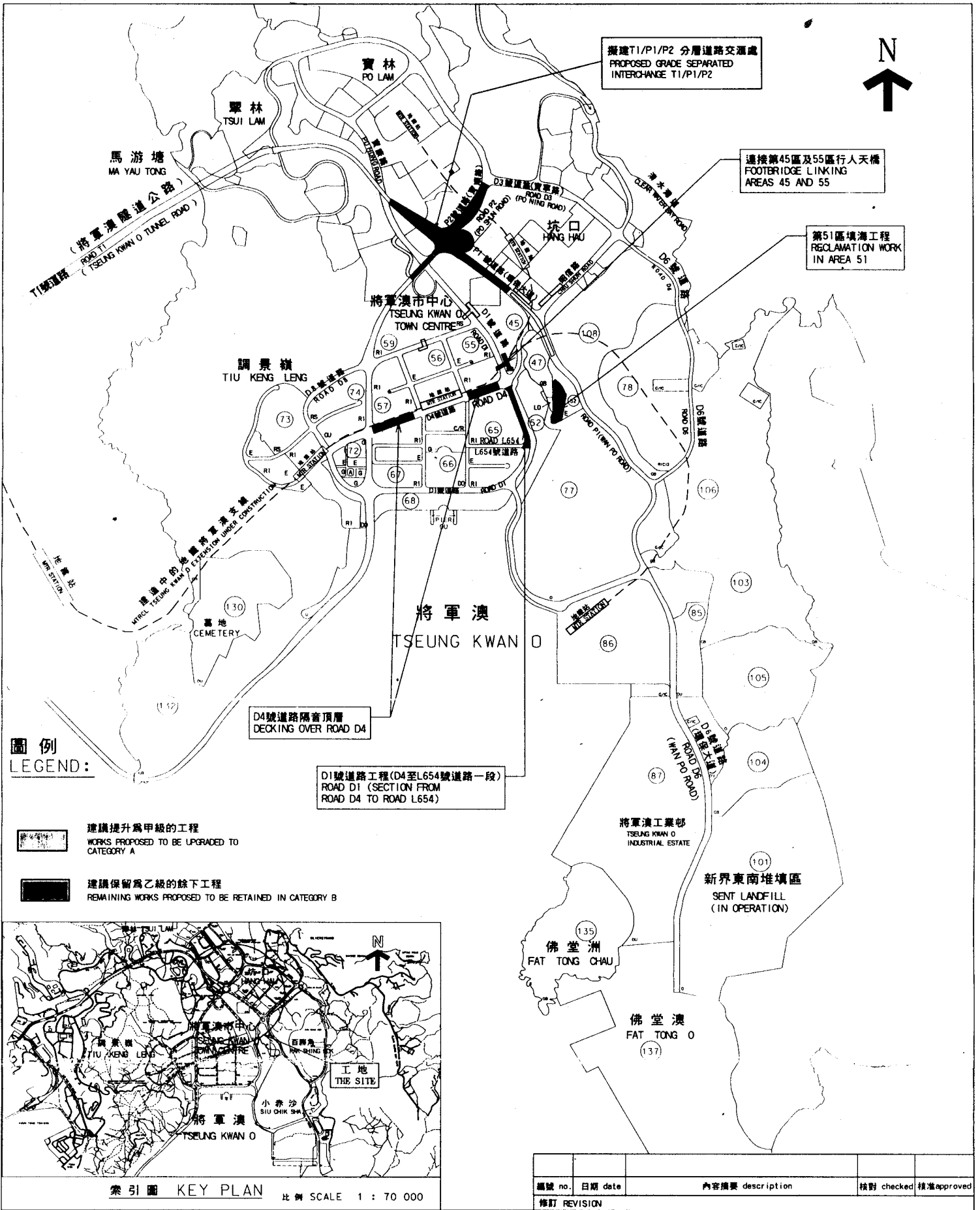
Upgrade to Cat A	Project (Approved Project Estimate)	Start date	Completion date
June 1992	<b>393CL</b> TKO development, phase II, stage IIIA, engineering works (\$332 million)	Dec 1992	Dec 1998
June 1993	<b>412CL</b> TKO development, phase II, remaining reclamation and main drainage works (\$200 million)	June 1994	Dec 1998
July 1995	<b>456CL</b> TKO development, engineering infrastructure at town centre north (\$385.6 million)	Dec 1995	June 1999
Dec 1997	<b>492CL</b> TKO development, engineering infrastructure at town centre central and widening of Wan Po Road (\$577 million)	Mar 1998	Dec 2002

27. In September 1997, we engaged consultants to undertake detailed design and investigation for this project and charged the cost of \$12.5 million to the block allocation **Subhead 7100CX** "New towns and urban area works, studies and investigations for items in Category D of the Public Works Programme". The consultants have completed the detailed design and drawings.



28. To minimise traffic disruption during construction, we will liaise with various departments concerned, and carry out temporary traffic diversion arrangements as and when necessary.

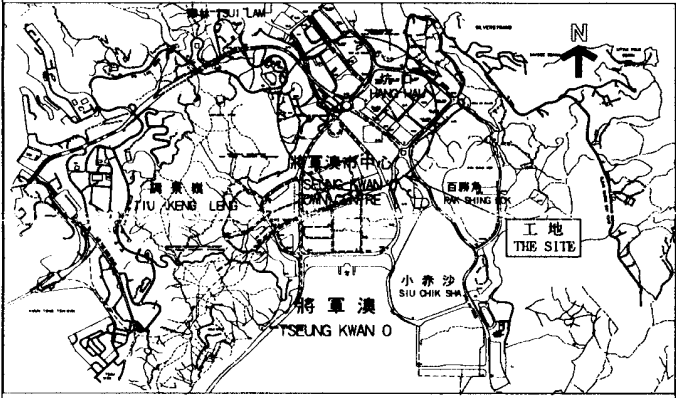
29. We estimate that the project will create some 250 jobs comprising 50 professional/technical staff and 200 labourers totalling 9 850 man-months.

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**圖例**  
LEGEND:


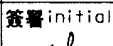
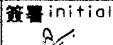

-  建議提升為甲級的工程  
WORKS PROPOSED TO BE UPGRADED TO CATEGORY A
-  建議保留為乙級的餘下工程  
REMAINING WORKS PROPOSED TO BE RETAINED IN CATEGORY B

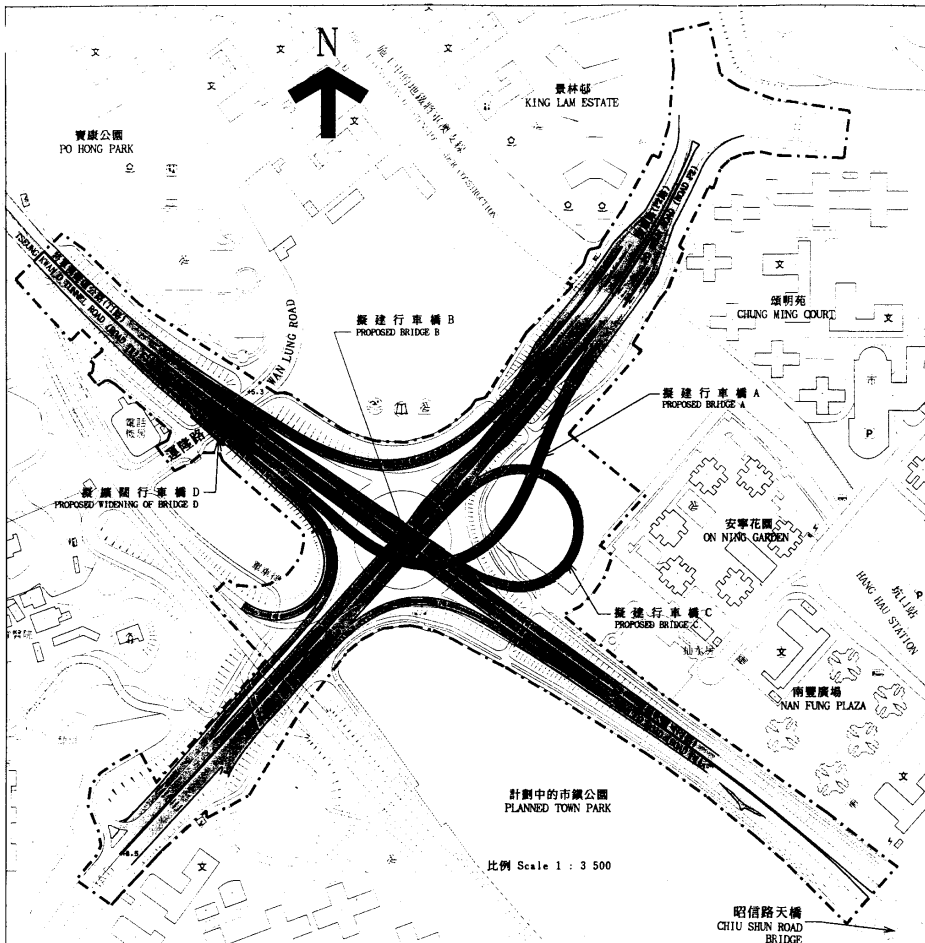


索引圖 KEY PLAN 比例 SCALE 1 : 70 000

編號 no.	日期 date	內容摘要 description	核對 checked	核准 approved
修訂 REVISION				

二〇〇一年至二〇〇二年年度工務小組委員會文件 P. W. S. C. SUBMISSION 2001-2002 項目編號 ITEM No.277CL

圖則名稱 drawing title <b>將軍澳發展計劃 第II期餘下工程</b> TSEUNG KWAN O DEVELOPMENT, PHASE II - REMAINING ENGINEERING WORKS	繪圖 drawn S K WONG	簽署 initial 	日期 date 28.12.2000	比例 scale 1:21 000	辦事處 office <b>新界東拓展處</b> NT EAST DEVELOPMENT OFFICE
	核對 checked C POON	簽署 initial 	日期 date 28.12.2000		
	核准 approved K C NG	簽署 initial 	日期 date 28.12.2000	圖則編號 drawing no. <b>TK 2272</b>	 <b>拓展署</b> TERRITORY DEVELOPMENT DEPARTMENT



圖例 LEGEND :

- 施工範圍  
LIMIT OF WORKS AREA
- 擬建架空道路  
PROPOSED ELEVATED CARRIAGEWAY
- 擬建地面行車路  
PROPOSED AT-GRADE CARRIAGEWAY
- +11.0  
主水平基準以上的路面水平  
ROAD LEVEL IN mPD
- 行車線及交通方向  
TRAFFIC LANE AND TRAFFIC DIRECTION
- 學校  
SCHOOL
- 巴士總站  
BUS TERMINUS
- 停車場  
CAR PARK
- 街市  
MARKET
- 運動場  
SPORT GROUND
- 電力站  
ELECTRIC SUB-STATION
- 小巴站  
MINIBUS TERMINUS
- 公園  
PARK
- 教堂  
CHURCH
- 游泳池  
SWIMMING POOL
- 圖書館  
LIBRARY
- 室內體育館  
INDOOR STADIUM

二〇〇一年至二〇〇二年度工務小組委員會文件 P.W.S.C. SUBMISSION 2001 - 2002

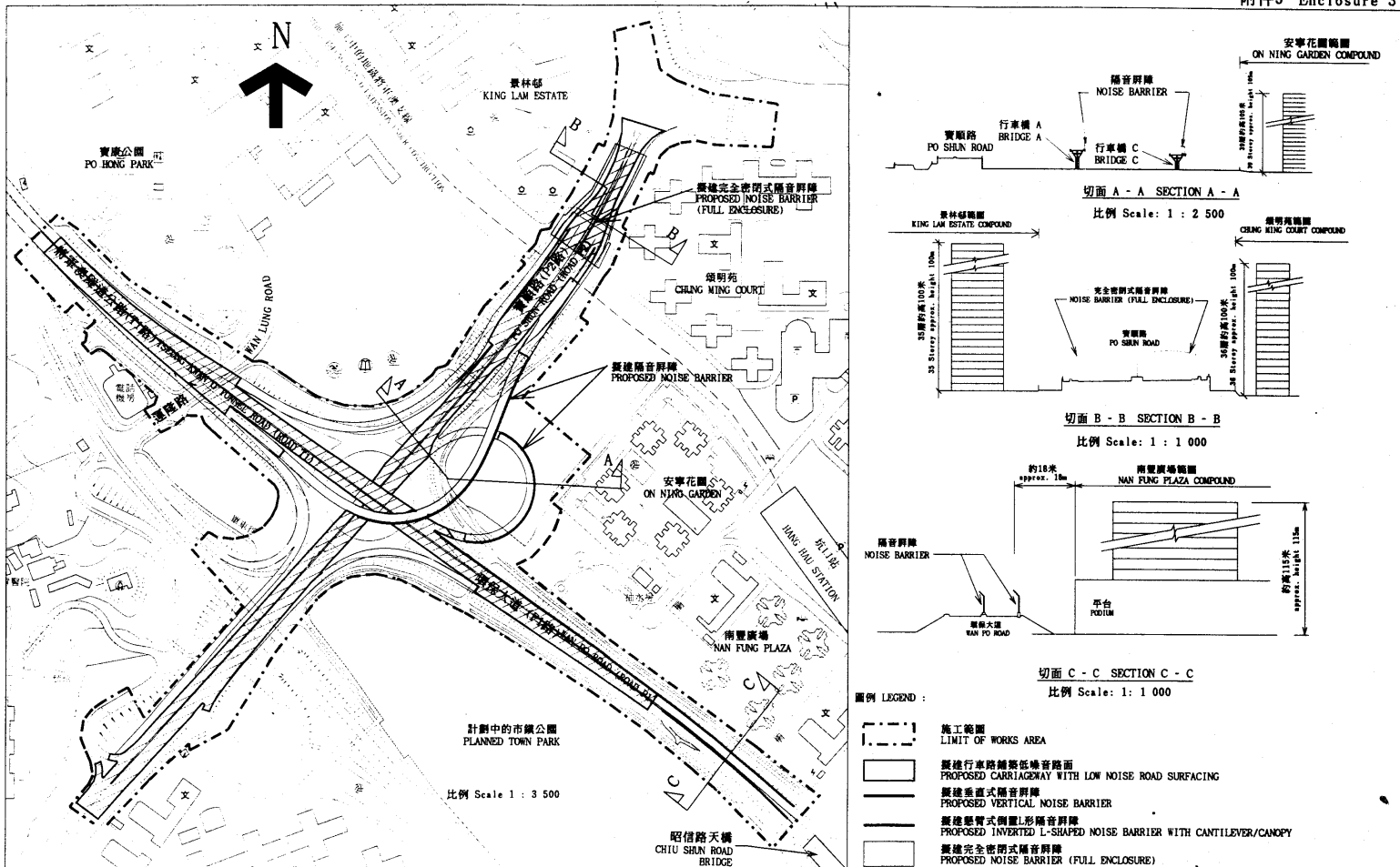
項目編號 ITEM No. 277CL

圖則名稱 drawing title  
將軍澳T1/P1/P2分層道路交匯處  
工地平面圖  
GRADE-SEPARATED INTERCHANGE T1/P1/P2, TSEUNG KWAN O  
SITE PLAN

繪圖 drawn S K WONG	簽署 initial 	日期 date 7.3.2001	比例 scale As shown
核對 checked C POON	簽署 initial 	日期 date 7.3.2001	繪圖編號 drawing no. TK2281
核准 approved K C NG	簽署 initial 	日期 date 7.3.2001	

辦事處 office  
新界東拓展處  
NT EAST DEVELOPMENT OFFICE

拓展署  
TERRITORY DEVELOPMENT  
DEPARTMENT

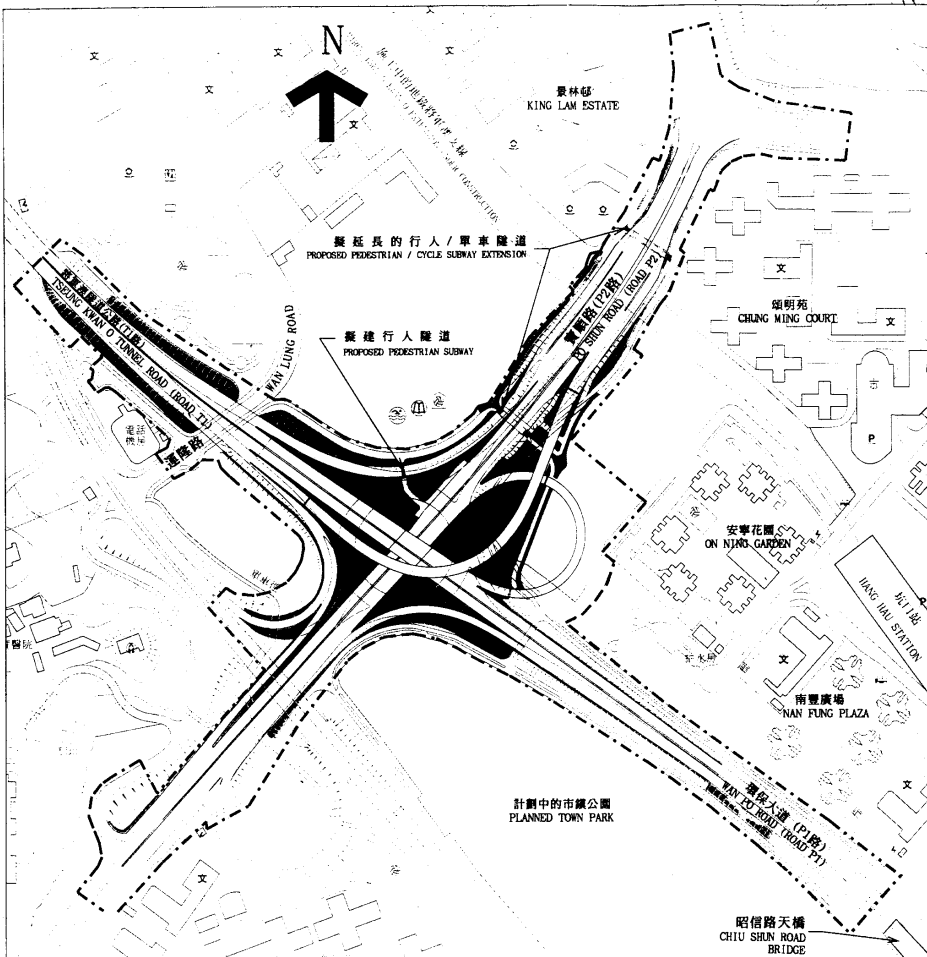


二〇〇一年至二〇〇二年年度工務小組委員會文件 P.W.S.C. SUBMISSION 2001 - 2002

圖則名稱 drawing title  
 將軍澳T1/P1/P2分層道路交匯處  
 擬建消滅噪音措施  
 GRADE-SEPARATED INTERCHANGE T1/P1/P2, TSEUNG KWAN O  
 PROPOSED NOISE MITIGATION MEASURES

繪圖 drawn H W SHUI	簽署 initial HW	日期 date 8.3.2001	比例 scale As shown	辦事處 office 新界東拓展處 NT EAST DEVELOPMENT OFFICE
核對 checked C POON	簽署 initial CP	日期 date 8.3.2001	繪圖編號 drawing no. TK2282	拓展署 TERRITORY DEVELOPMENT DEPARTMENT
核准 approved K C NG	簽署 initial KC	日期 date 8.3.2001		

項目編號 ITEM No.277CL



圖例 LEGEND :

- 施工範圍  
LIMIT OF WORKS AREA
- 擬建單車徑  
PROPOSED CYCLE TRACK
- 擬建行人/單車隧道  
PROPOSED PEDESTRIAN/CYCLE SUBWAY
- 擬建行人路  
PROPOSED FOOTPATH
- 擬建綠化地帶  
PROPOSED LANDSCAPE AREA
- 現有/擬建斜坡  
EXISTING/PROPOSED SLOPE
- 學校  
SCHOOL
- 巴士總站  
BUS TERMINUS
- 停車場  
CAR PARK
- 街市  
MARKET
- 運動場  
SPORT GROUND
- 電力站  
ELECTRIC SUB-STATION
- 小巴士  
MINIBUS TERMINUS
- 公園  
PARK
- 教堂  
CHURCH
- 游泳池  
SWIMMING POOL
- 圖書館  
LIBRARY
- 室內體育館  
INDOOR STADIUM

二〇〇一年至二〇〇二年年度工務小組委員會文件 P.W.S.C. SUBMISSION 2001 - 2002

圖則名稱 drawing title  
**將軍澳T1/P1/P2分層道路交匯處**  
**擬建附屬工程**  
 GRADE-SEPARATED INTERCHANGE T1/P1/P2, TSEUNG KWAN O  
 PROPOSED ANCILLARY WORKS

繪圖 drawn W K CHUI	簽署 initial <i>W K CHUI</i>	日期 date 8.3.2001	比例 scale 1 : 3500	項目編號 ITEM No. 277CL
核對 checked C POON	簽署 initial <i>C POON</i>	日期 date 8.3.2001	辦事處 office 新界東拓展處 NT EAST DEVELOPMENT OFFICE	
核准 approved K C NG	簽署 initial <i>K C NG</i>	日期 date 9.3.2001	繪圖編號 drawing no. TK2283	拓展署 TERRITORY DEVELOPMENT DEPARTMENT

## Enclosure 5 to PWSC(2001-02)19

### 277CL – Tseung Kwan O development, phase II, remaining engineering works

#### Breakdown of the estimates 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	27	38	2.4	3.7
	Technical	15	14	2.4	0.7
(ii) Preparation of as-built drawings	Professional	2	38	2.4	0.3
	Technical	9	14	2.4	0.4
(b) Resident site staff costs	Professional	165	38	1.7	16.1
	Technical	580	14	1.7	18.8
<b>Total consultants' staff costs</b>					40.0

\* 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 profits 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 1.4.2000, MPS pt. 38 = \$57,525 per month and MPS pt. 14 = \$19,055 per month)
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 the overall consultancy agreement for the Tseung Kwan O Development Phase II.