

## **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 \$438.6 million in money-of-the-day (MOD) 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 \$438.6 million in MOD prices for the construction of a grade-separated interchange at the junction of Road T1/Road P1/Road P2.

## 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 upgrading of parts of **277CL** to Category A (see paragraph 32 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.

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

- (a) construction of a 352-m two-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 two-lane northbound and three-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 and from Road T1;

/(f) .....

- (f) construction of a pedestrian subway and extension of two existing pedestrian/cycle subways across Road P2;
- (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 April 2002 for completion in April 2005.

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 planned developments in TKO, we estimate that the population in TKO will increase from the present 270 000 to 390 000 in 2006, and 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 –

/Year .....

<sup>1</sup> Design flow/capacity (DFC) ratio is an indicator that 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; and that above 1.2 indicates more serious congestion with traffic speeds progressively deteriorating with further increases in traffic.

| Year | DFC ratio<br>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 deteriorate with the growth in traffic. The proposed works can greatly improve the vehicular movement as the traffic to and 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 –

| Year | v/c ratio<br>with proposed roadworks |
|------|--------------------------------------|
| 2006 | 0.93                                 |
| 2011 | 0.70 <sup>4</sup>                    |

**/FINANCIAL .....**

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<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> A volume/capacity (v/c) ratio is an indicator that reflects the performance of a road. 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 and the traffic will flow smoothly. A v/c ratio above 1.0 indicates the onset of congestion; and that 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.

**FINANCIAL IMPLICATIONS**

10. We estimate the capital cost of the project to be \$438.6 million in MOD prices (see paragraph 11 below), made up as follows –

|  | <b>\$ million</b> |                            |
|--|-------------------|----------------------------|
| (a) Earthworks   | 21.2              |                            |
| (b) Roadworks with associated footpaths and cycle tracks | 53.3              |                            |
| (c) Vehicular bridges                                    | 109.8             |                            |
| (d) Pedestrian subways                                   | 2.4               |                            |
| (e) Drainage works                                       | 13.1              |                            |
| (f) Traffic control and surveillance facilities          | 18.0              |                            |
| (g) Landscaping works                                    | 7.5               |                            |
| (h) Noise mitigation measures                            | 118.2             |                            |
| (i) noise enclosure                                      | 58.9              |                            |
| (ii) noise barriers                                      | 56.8              |                            |
| (iii) low noise road surfacing                           | 2.5               |                            |
| (i) EM&A programme                                       | 8.3               |                            |
| (j) Consultants' fees                                    | 43.2              |                            |
| (i) construction stage                                   | 5.7               |                            |
| (ii) resident site staff costs                           | 37.5              |                            |
| (k) Contingencies  | 39.5              |                            |
| Sub-total  | 434.5             | (in September 2001 prices) |

/(1) .....

|                                    |                       |
|------------------------------------|-----------------------|
| (l) Provision for price adjustment | 4.1                   |
|                                    | <hr/>                 |
| Total                              | 438.6 (in MOD prices) |
|                                    | <hr/>                 |

Due 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.

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

| Year        | \$ million<br>(Sept 2001) | Price<br>adjustment<br>factor | \$ million<br>(MOD) |
|-------------|---------------------------|-------------------------------|---------------------|
| 2002 – 2003 | 30.0                      | 0.99700                       | 29.9                |
| 2003 – 2004 | 130.0                     | 1.00398                       | 130.5               |
| 2004 – 2005 | 182.0                     | 1.01101                       | 184.0               |
| 2005 – 2006 | 80.0                      | 1.01808                       | 81.4                |
| 2006 – 2007 | 12.5                      | 1.02521                       | 12.8                |
|             | <hr/>                     |                               | <hr/>               |
|             | 434.5                     |                               | 438.6               |
|             | <hr/>                     |                               | <hr/>               |

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 2002 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 annual recurrent expenditure arising from this project to be \$3.78 million.

/PUBLIC .....

**PUBLIC CONSULTATION**

14. We consulted the Traffic and Transport Committee of the then Sai Kung Provisional District Board 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 had 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 authorised 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 had no objection to the proposed works. A LegCo Case Conference was held on 2 May 2001 to discuss the request made by the residents of Nan Fung Plaza and On Ning Garden to further enhance our proposed noise mitigation measures under the project. We explained at the Conference that our proposed mitigation measures would meet the current noise standard of 70dB(A).

At the Public Works Subcommittee (PWSC) meeting on 3 May 2001, the Administration further explained that for policy reasons it was not appropriate to further enhance the noise mitigation measures below the current standard of 70 dB(A). The item did not receive majority support on that occasion.

19. After the PWSC meeting, we further discussed with the Chairman of the Traffic and Transport Committee (T&TC) of the Sai Kung District Council (SKDC) and the Chairman of the SKDC on 28 May 2001 and 24 July 2001 respectively, and met with residents of Nan Fung Plaza and On Ning Garden on 9 August 2001. The meeting revealed that the real concern of the residents was the existing traffic noise during the night-time caused by speeding and heavy vehicles (see paragraphs 25 & 26 below).

20. The T&TC of the SKDC and the full Council further discussed the project on 9 August 2001 and 25 September 2001, reaffirmed their support and pointed out that noise mitigation to existing situation and any proposed measures beyond the current noise standard should be dealt with separately. They urged the Administration to resubmit the project to PWSC as soon as possible.

21. We circulated an information paper on this project to the LegCo Panel on Planning, Lands and Works in December 2001.

## **ENVIRONMENTAL IMPLICATIONS**

22. 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.

23. 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) .....



- (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.

24. 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 Nan 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 by up to 13 dB(A) and the noise levels at 273 dwellings in On Ning Garden by up to 6 dB(A). An amended EP incorporating the enhancing noise mitigation measures was issued in May 2001.

25. To address the concerns of the residents of Nan Fung Plaza and On Ning Garden mentioned in paragraph 19 above, we have carried out a night-time traffic and noise survey for seven consecutive nights in October 2001 at four dwellings in Nan Fung Plaza. The results of the survey indicated that noise levels measured between 8:00 p.m. and 8:00 a.m. within these dwellings were below 70dB(A). We envisaged that with our proposed noise mitigation measures, the noise levels to be brought about by operation of the proposed road scheme within the said period would be further reduced to a level ranging from 53dB(A) to 65dB(A).

26. The traffic survey conducted concurrently with the night-time noise survey mentioned above revealed that speeding was common at the location, and that a large proportion of heavy vehicles used the Chiu Shun Road Bridge in the vicinity of Nan Fung Plaza. This has been the main source of traffic noise during the night-time. With these findings, we have examined other measures to bring down the night-time noise. These include installation of speed enforcement camera to deter speeding and the possible prohibition of heavy vehicles on the said bridge during night-time. We will follow up these possible measures and consult the Sai Kung District Council and other relevant parties such as industrial undertakings in the area. We will also lay low noise road surfacing along the entire section of Wan Po Road under this project.

27. 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), noise mitigation measures (\$118.2 million) and an EM&A programme (\$8.3 million) in the overall project estimate.

28. 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 (C&D) materials as much as possible. We estimate that the project will generate about 55 400 cubic metres (m<sup>3</sup>) of C&D materials. Of these, we will reuse about 45 400 m<sup>3</sup> (82%) on site and dispose of 10 000 m<sup>3</sup> (18%) at landfills. The notional cost of accommodating C&D waste at landfill sites is estimated to be \$1.25 million for this project (based on a notional unit cost<sup>5</sup> of \$125/m<sup>3</sup>).

29. 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 require the contractor to separate public fill from C&D waste for disposal at appropriate facilities. We will record the disposal, reuse and recycling of C&D materials for monitoring purposes.

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

/31. ....

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<sup>5</sup> This estimate has taken into account the cost for developing, operating and restoring the landfills after they are filled and the aftercare required. It does not include the land opportunity cost for existing landfill sites (which is estimated at \$90 per/m<sup>3</sup>), 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.

**LAND ACQUISITION**

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

**BACKGROUND INFORMATION**

32. 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 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        |

33. 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.

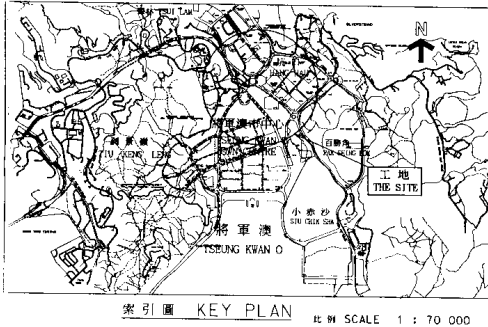
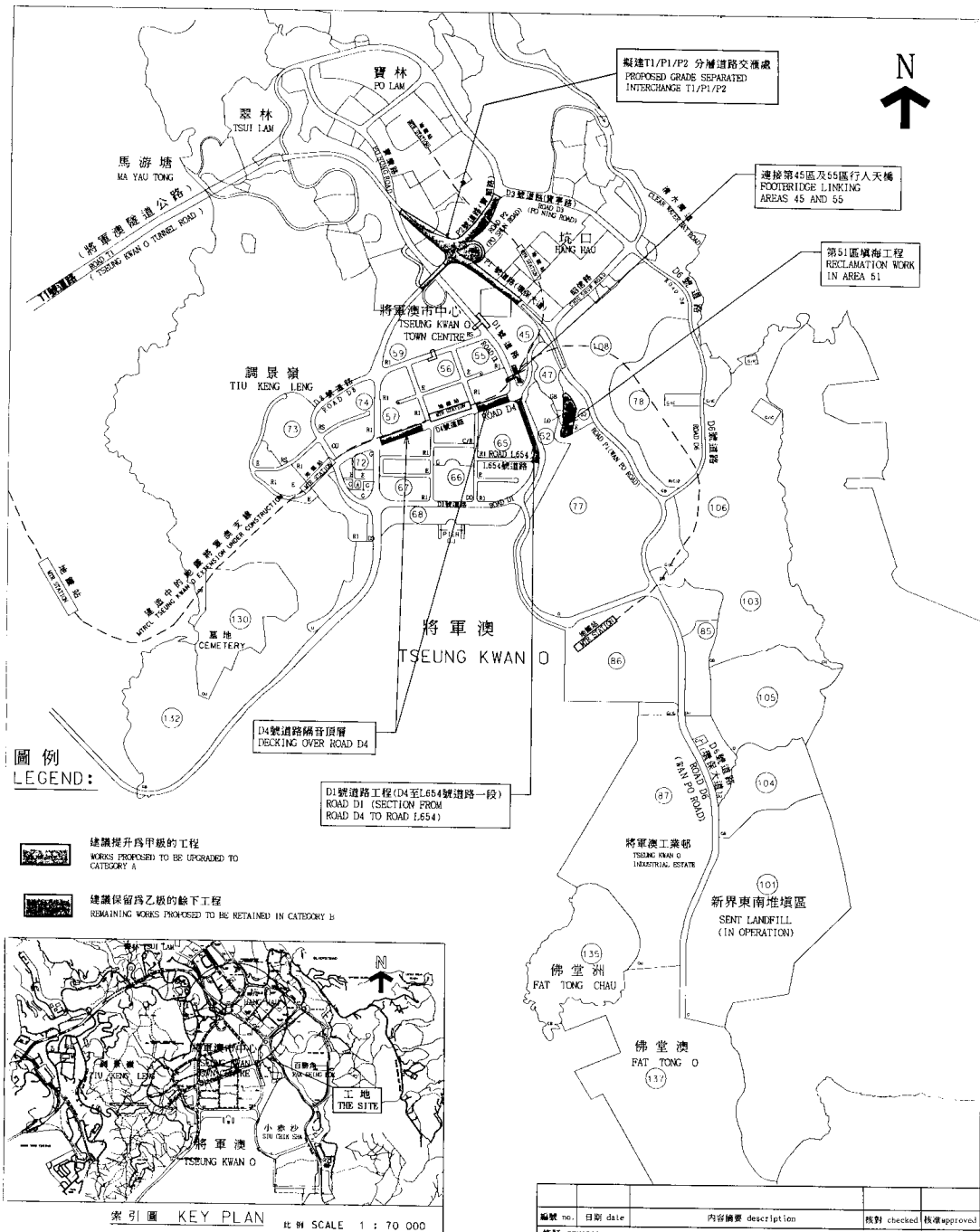
/34. ....

34. On 3 May 2001, we put forward paper PWSC(2001-02)19 to PWSC proposing the upgrading of part of **277CL** to Category A for the construction of the proposed works. As mentioned in paragraph 18 above, the paper did not receive majority support from members.

35. 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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Planning and Lands Bureau  
December 2001

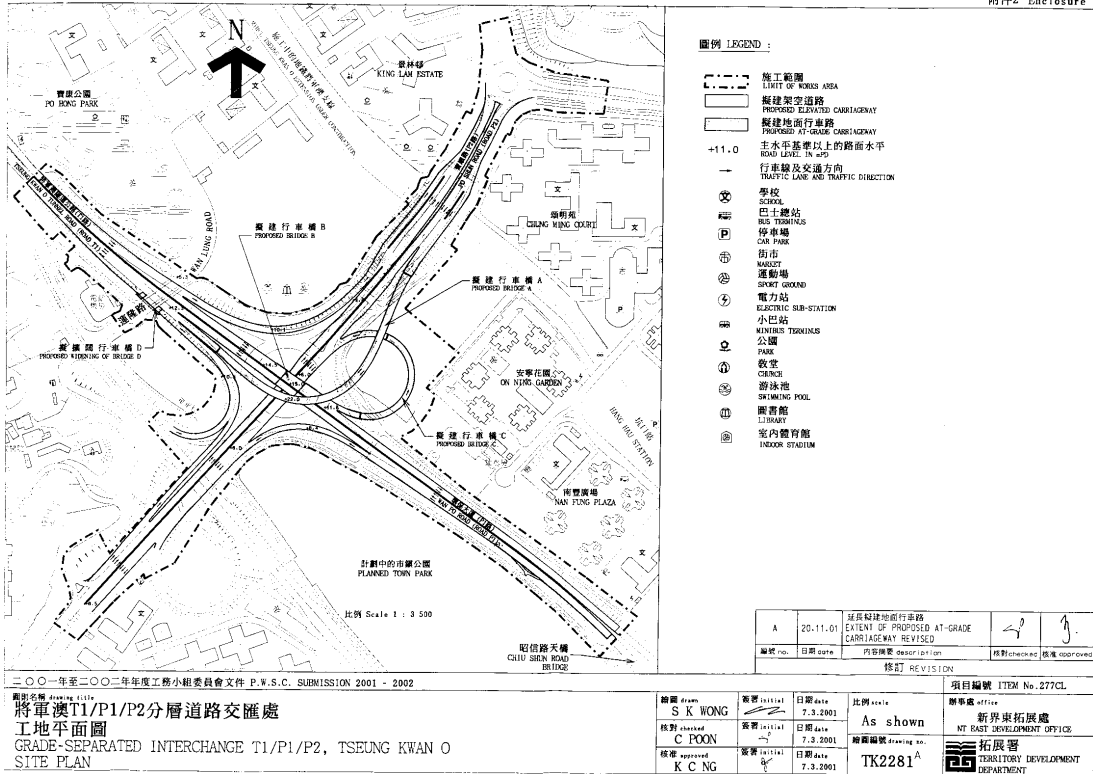


| 編號 no.      | 日期 date | 內容摘要 description | 核對 checked | 核准 approved |
|-------------|---------|------------------|------------|-------------|
| 修訂 REVISION |         |                  |            |             |

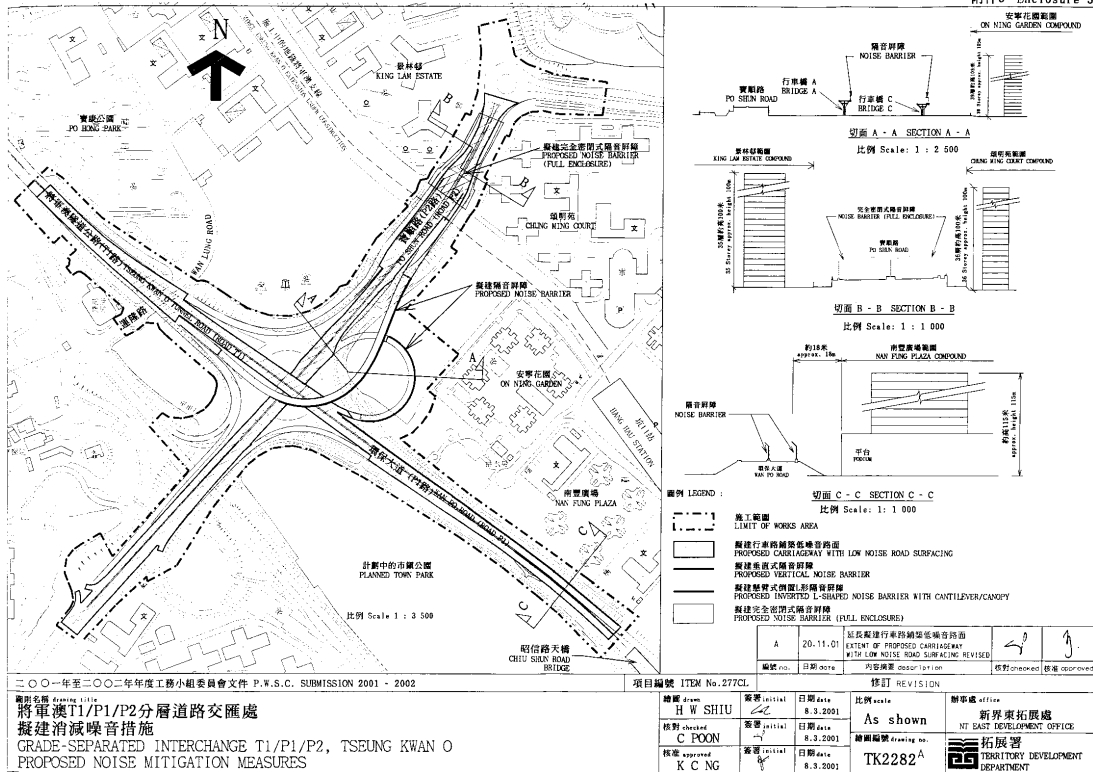
二〇〇一年至二〇〇二年度工務小組委員會文件 P. W. S. C. SUBMISSION 2001-2002 項目編號 ITEM No. 277CL

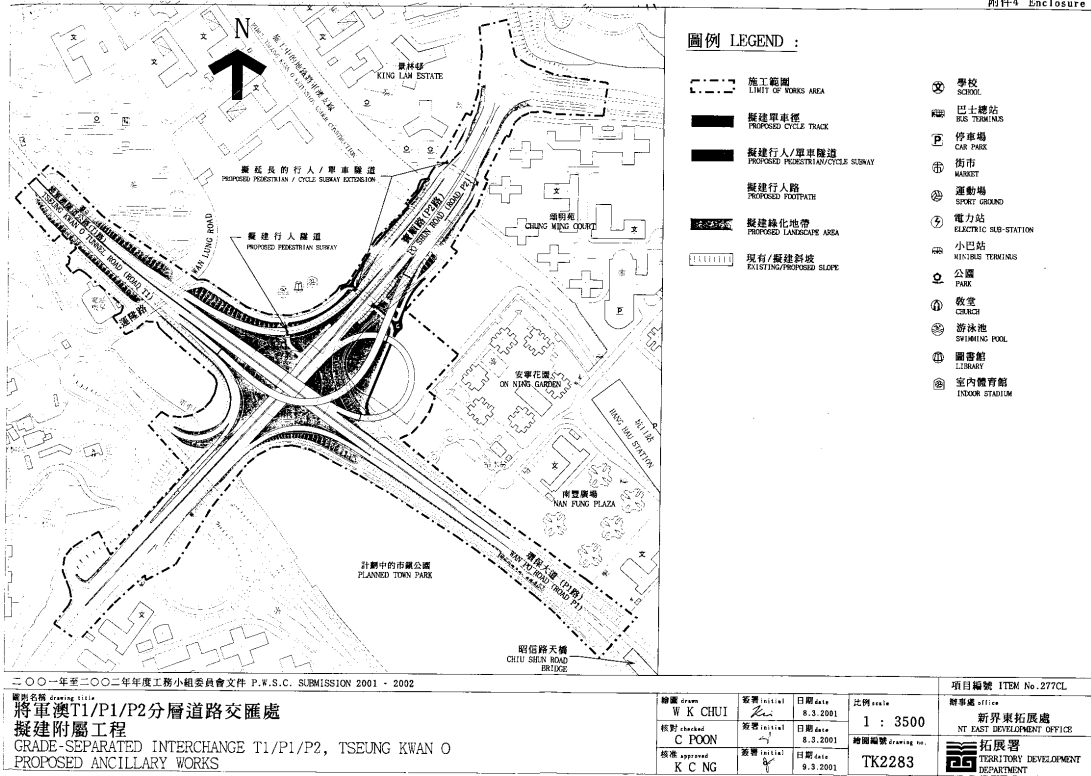
|   |  |                       |                |                       |                             |  |
|---|--|-----------------------|----------------|-----------------------|-----------------------------|--|
| 圖則名稱 drawing title<br><b>將軍澳發展計劃<br/>                 第 II 期餘下工程</b><br>TSEUNG KWAN O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

附件 1 Enclosure 1



附件3 Enclosure 3





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



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

**Breakdown of the estimates for consultants' fees**

| <b>Consultants' staff costs</b>                     |              | <b>Estimated man-months</b> | <b>Average MPS* salary point</b> | <b>Multiplier</b> | <b>Estimated fees (\$ million)</b> |
|---|--------------|-----------------------------|----------------------------------|-------------------|------------------------------------|
| <b>(a) Consultants' fees for construction stage</b> |              |                             |                                  |                   |                                    |
| (i) Contract administration                         | Professional | 29                          | 38                               | 2.4               | 4.2                                |
|   | Technical    | 15                          | 14                               | 2.4               | 0.7                                |
| (ii) Preparation of as-built drawings               | Professional | 2                           | 38                               | 2.4               | 0.3                                |
|   | Technical    | 10                          | 14                               | 2.4               | 0.5                                |
| <b>(b) Resident site staff costs</b>                | Professional | 170                         | 38                               | 1.7               | 17.5                               |
|   | Technical    | 602                         | 14                               | 1.7               | 20.0                               |
| <b>Total consultants' staff costs</b>               |              |                             |                                  |                   | 43.2                               |

\* MPS = Master Pay Scale

**Notes**

1. A multiplier of 2.4 is applied to the average MPS point to estimate the full staff costs including the consultants' overheads and profit, as the staff will be employed in the consultants' offices. A multiplier of 1.7 is applied in the case of resident site staff supplied by the consultants. (At 1.4.2001, MPS pt. 38 = \$60,395 per month and MPS pt. 14 = \$19,510 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 consultancy agreement for the Tseung Kwan O Development Phase II.