

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

### **HEAD 703 – BUILDINGS**

#### **Environmental Hygiene – Toilets and bathhouses**

#### **8NT – Conversion of aqua privies into flushing toilets – phase 2B**

Members are invited to recommend to Finance Committee the upgrading of **8NT** to Category A at an estimated cost of \$36.1 million in money-of-the-day prices for the conversion of 30 aqua privies into flushing toilets.

### **PROBLEM**

With the rising expectations of the community over the standard of public toilet facilities, aqua privies at popular sightseeing spots or locations of heavy usage in the New Territories can no longer meet the present-day demand.

### **PROPOSAL**

2. The Director of Architectural Services, with the support of the Secretary for Health, Welfare and Food, proposes to upgrade **8NT** to Category A at an estimated cost of \$36.1 million in money-of-the-day (MOD) prices for the conversion of 30 aqua privies into flushing toilets.

**/PROJECT .....**

**PROJECT SCOPE AND NATURE**

3. Our objective is to convert 100 aqua privies of relatively higher usage rate or located at popular scenic spots and tourist attractions into flushing toilets. In order to speed up the implementation programme, we have been implementing the conversion works in phases. In July 2004, Members approved the upgrading of **6NT** to Category A for the conversion of 30 of these 100 aqua privies as phase 1 of the project. We have commenced the phase 1 works in batches starting from February 2005 and aim to complete them in the second half of 2006. In May 2005, Members approved the upgrading of **7NT** to Category A for the conversion of another 40 aqua privies as phase 2A of the project. We will start the phase 2A works in October 2005 and aim to complete them by early 2007.

4. A list of the remaining 30 aqua privies covered by phase 2B is at Enclosure 1. Similar to phase 1 and phase 2A, the conversion works under phase 2B are classified into the following three types -

(a) **Type 1 – General refurbishment works at 22 locations, including –**

- (i) conversion of existing aqua privies into toilets with flushing system including alterations to cubicles and the provision of pedestal or squatting type water closets;
- (ii) replacement of internal/external wall and floor finishes;
- (iii) improvement of hand-washing facilities;
- (iv) improvement of lighting and ventilation; and
- (v) conversion of the existing septic tank into an underground holding tank.

/(b) .....

- (b) **Type 2 – Installation of newly introduced bio-toilet system at five locations, including –**
  - (i) general refurbishment works under Type 1; and
  - (ii) installation of a newly introduced bio-treatment system to treat waste by a biological process and to recirculate the treated effluent for flushing purpose.
  
- (c) **Type 3 – Connection with public sewerage at three locations, including –**
  - (i) general refurbishment works under Type 1 items (i) to (iv); and
  - (ii) connecting underground drains of the toilets to the public sewer available in the vicinity.

5. The type of works to be implemented at each aqua privy is subject to site constraints and the availability of public sewer nearby. For Type 1 and Type 2 conversion works, we will convert existing septic tanks into holding tanks for waste. For the 22 Type 1 aqua privies without bio-treatment plant, we will arrange more frequent tankering away of waste. For the five Type 2 aqua privies where sufficient space is available within the existing site area, we will install the newly introduced bio-treatment plants for pilot run (as indicated in Enclosure 1). For the three Type 3 aqua privies, as nearby public sewer is available, we will connect their underground drains to the public sewer.

6. The layout plans of a typical aqua privy and a flushing toilet converted from an aqua privy are at Enclosure 2 and Enclosure 3 respectively. An artist impression of the toilet after the implementation of the proposed conversion works is at Enclosure 4. We plan to carry out the proposed conversion works for the 30 aqua privies in batches and to commence works on site in January 2006. During the closure period of the aqua privies when conversion works are underway, we will make available portable toilets on site for use by the public. We aim to complete the works under phase 2B, and hence the entire project, in late 2007.

**/JUSTIFICATION .....**

## JUSTIFICATION

7. At present, aqua privies are not provided with flushing system. Toilet waste passes down the squatting hole of each toilet compartment and is collected in the septic tank underneath the aqua privies. The sewage undergoes an anaerobic decomposition by action of bacteria, reducing the volume of solid waste substantially. The resulting effluent passes through a soakage pit for filtering before it is discharged. The sludge will need to be pumped out and carried away by desludging vehicles/barges normally not less than once every six months depending on the usage rate of an aqua privy. Although the anaerobic process of a septic tank system helps reduce the volume of sludge, the absence of a flushing system may still create hygiene, pest and odour problems inside toilet compartments. Hence, aqua privies are not the desirable public toilet facilities at locations of relatively higher usage rate or popular scenic spots and tourist attractions.

8. Furthermore, the growing popularity of some sightseeing spots in the New Territories and outlying islands strongly calls for the upgrading of the existing aqua privies to flushing toilets with proper hand-washing facilities. The former Team Clean, chaired by the Chief Secretary for Administration, has therefore recommended, among other things, to accelerate the conversion programme for about 100 aqua privies which are close to scenic spots, tourist attractions or in locations with relatively higher usage rates, in order to improve the hygiene conditions, eliminate pest problems arising from the design of aqua privies and upgrade the standard of provision of toilet facilities.

## FINANCIAL IMPLICATIONS

9. We estimate the capital cost of **8NT** to be \$36.1 million in MOD prices (see paragraph 10 below), made up as follows –

	<b>\$ million</b>
(a) Site preparation	3.1
(b) Building	9.1
(c) Building services	5.2
(d) Drainage	10.1
(e) External works	2.8

/(f) .....

	<b>\$ million</b>	
(f) Consultants' fees for contract administration	1.5	
(g) Provision of temporary portable toilets	1.0	
(h) Contingencies	<u>3.1</u>	
Sub-total	35.9	(in September 2004 prices)
(i) Provision for price adjustment	0.2	
Total	<u>36.1</u>	(in MOD prices)

We will engage consultants to undertake contract administration of the project. A detailed breakdown of the estimate for consultants' fee by man-months is at Enclosure 5. The construction floor area (CFA) of the 30 aqua privies is about 1 931 square metres (m<sup>2</sup>). The estimated construction unit cost, represented by the building and the building services costs, is \$7,405 per m<sup>2</sup> of CFA in September 2004 prices. We consider this unit cost reasonable as compared with similar projects implemented by the Government.

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

<b>Year</b>	<b>\$ million (Sep 2004)</b>	<b>Price adjustment factor</b>	<b>\$ million (MOD)</b>
2005 – 06	2.0	1.00450	2.0
2006 – 07	13.8	1.00576	13.9
2007 – 08	11.8	1.00576	11.9
2008 – 09	6.3	1.00576	6.3
2009 – 10	2.0	1.00953	2.0
	<u>35.9</u>		<u>36.1</u>

/11. ....

11. We have derived the MOD estimates on the basis of the Government's latest forecast of trend rate of change in the prices of public sector building and construction output for the period 2005 to 2010. We intend to award the contract on a lump-sum basis because we can clearly define the scope of works in advance. The contract will not provide for price adjustment because the contract period will not exceed 21 months.

12. At present, the annual recurrent expenditure for the 30 aqua privies under phase 2B is \$1.2 million. Upon completion of the project, the annual recurrent expenditure will increase to about \$2.5 million.

## **PUBLIC CONSULTATION**

13. We consulted the Legislative Council Panel on Food Safety and Environmental Hygiene on this project in November 2003. The Panel generally supported the project. In July 2004, Members approved the upgrading of 6NT to Category A for the conversion of 30 aqua privies into flushing toilets as phase 1 of the project. In May 2005, Members also approved the upgrading of 7NT to Category A for the conversion of another 40 aqua privies as phase 2A of the project. We consulted all relevant District Councils on phase 2B of the project in March and April 2004 and January, February and April 2005, and they supported the proposed conversion works.

## **ENVIRONMENTAL IMPLICATIONS**

14. The project is not a designated project under the Environmental Impact Assessment Ordinance and will have little potential for giving rise to adverse environmental impacts. During construction, we will control noise, dust and site run-off nuisances to within established standards and guidelines through the implementation of mitigation measures in the relevant contract. These include the use of silencers, mufflers, acoustic lining or shields for noisy construction activities, and frequent cleaning and watering of the site.

15. At the planning and design stages, we will consider measures to reduce the generation of construction and demolition (C&D) materials. We will introduce more prefabricated building elements into the project design to reduce temporary formwork and construction waste. These include dry-wall partitioning and proprietary fittings and fixtures. We will use suitable excavated materials for filling within the project site to minimise off-site disposal. In addition, we will require the contractor to use metal site hoardings and signboards so that these materials can be recycled or reused in other projects.

16. We will require the contractor to submit a waste management plan (WMP) for approval. The WMP will include appropriate mitigation measures to avoid, reduce, reuse and recycle C&D materials. We will ensure that the day-to-day operations on site comply with the approved WMP. We will control the disposal of public fill and C&D waste to designated public filling facilities and landfills respectively 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.

17. We estimate that the project will generate about 180 cubic metres (m<sup>3</sup>) of C&D materials. Of these, we will reuse about 54 m<sup>3</sup> (30.0%) on site, reuse about 103 m<sup>3</sup> (57.2%) as fill in public filling areas<sup>1</sup>, and dispose of about 23 m<sup>3</sup> (12.8%) at landfills. The notional cost of accommodating C&D waste at landfill sites is estimated to be \$2,875 for this project (based on a notional unit cost<sup>2</sup> of \$125/m<sup>3</sup>).

## LAND ACQUISITION

18. The proposed works do not require any land acquisition.

## BACKGROUND INFORMATION

19. We upgraded 8NT to Category B in May 2005. We engaged consultants to undertake detailed design and tender documentation of the project at a total estimated cost of \$600,000, and will charge this amount to block allocation **Subhead 3100GX** "Project feasibility studies, minor investigations and consultants' fees for items in Category D of the Public Works Programme". We have completed the site investigation using in-house staff resources.

20. The proposed aqua privies conversion works will not involve any tree removal or planting proposals.

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<sup>1</sup> A public filling area is a designated part of a development project that accepts public fill for reclamation purposes. Disposal of public fill in a public filling area requires a licence issued by the Director of Civil Engineering and Development.

<sup>2</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/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.

21. We estimate that the proposed works will create about 55 jobs (47 for labourers and eight for professional/technical staff) providing a total employment of 850 man-months.

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Health, Welfare and Food Bureau  
May 2005



**8NT – Conversion of aqua privies into flushing toilets – phase 2B**

**Locations of aqua privies**

**A. Locations of 22 aqua privies to be converted under Type 1 works**

**Islands District**

1. Ma Wan Chung, Tung Chung

**North District**

1. Ho Ka Yuen, Fanling
2. Ho Sheung Heung Old Village Site I, Sheung Shui
3. Ho Sheung Heung Old Village Site II, Sheung Shui
4. Yin Kong Site II, Sheung Shui

**Sai Kung District**

1. Pik Uk Village
2. Tai Chung Hau
3. Tso Wo Hang
4. Wo Mei

**Tai Po District**

1. Po Sam Pai Village

**Tsuen Wan District**

1. Hon Man Upper Village

**Yuen Long District**

1. Ha Tsuen San Wai
2. Ha Tsuen Shi
3. Kam Tin Shi
4. Kam Tin Tze Tong Tsuen
5. Lau Fan Shan Kau Nam Street
6. Ping Shan Shui Bin Tsuen
7. San Tin Pak Hok Chau
8. San Tin Tai Sang Wai
9. San Tin Tsing Lung Tsuen
10. Shap Pat Heung Wong Uk Tsuen
11. Wang Chau Yeung Uk Tsuen

**B. Locations of five aqua privies to be converted under Type 2 works**

**North District**

1. Kan Lung Wai, Fanling
2. Ap Chau Site I, Sha Tau Kok

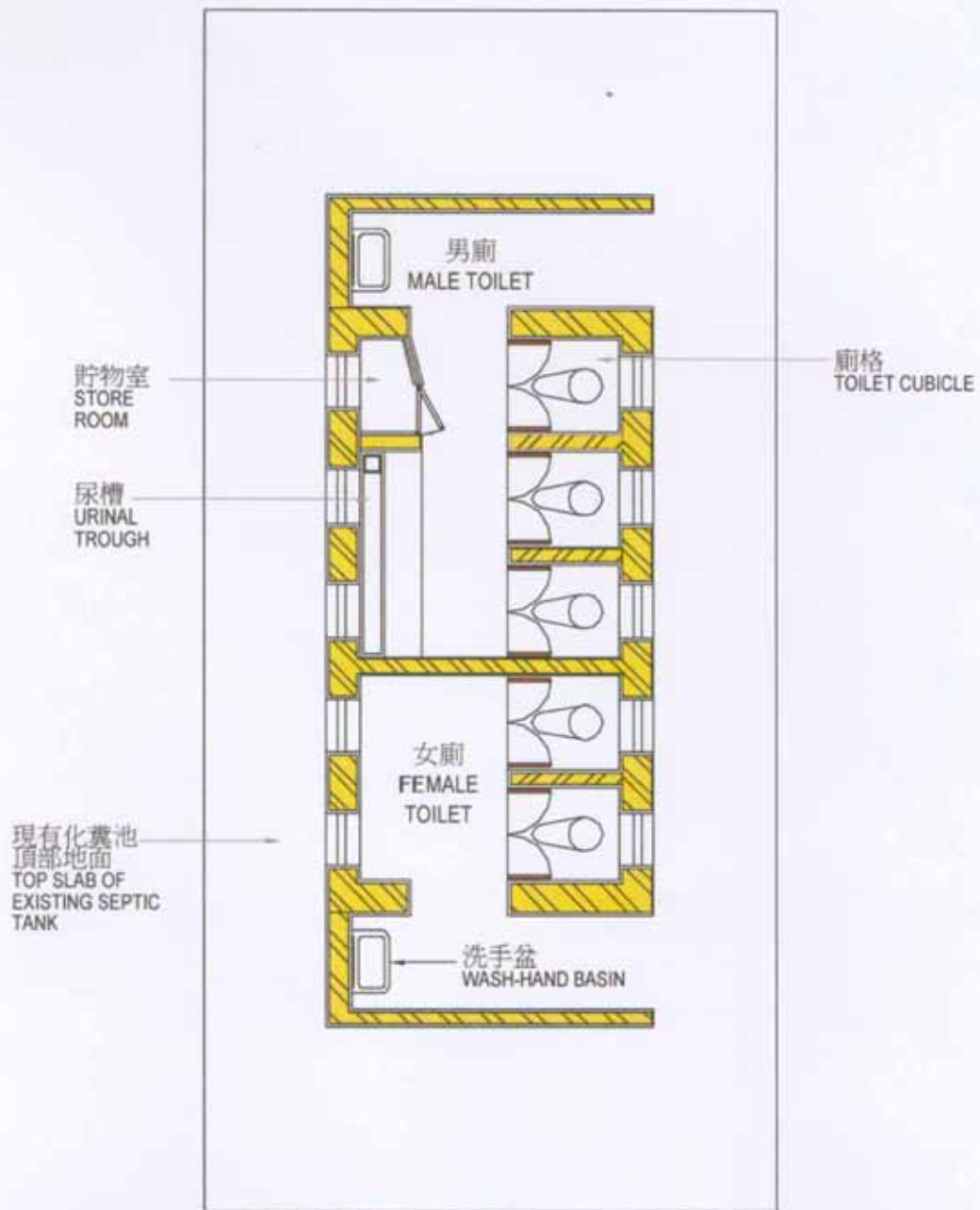
**Sai Kung District**

1. Chek Keng
2. Ham Tin
3. Sai Wan Site II

**C. Locations of three aqua privies to be converted under Type 3 works**

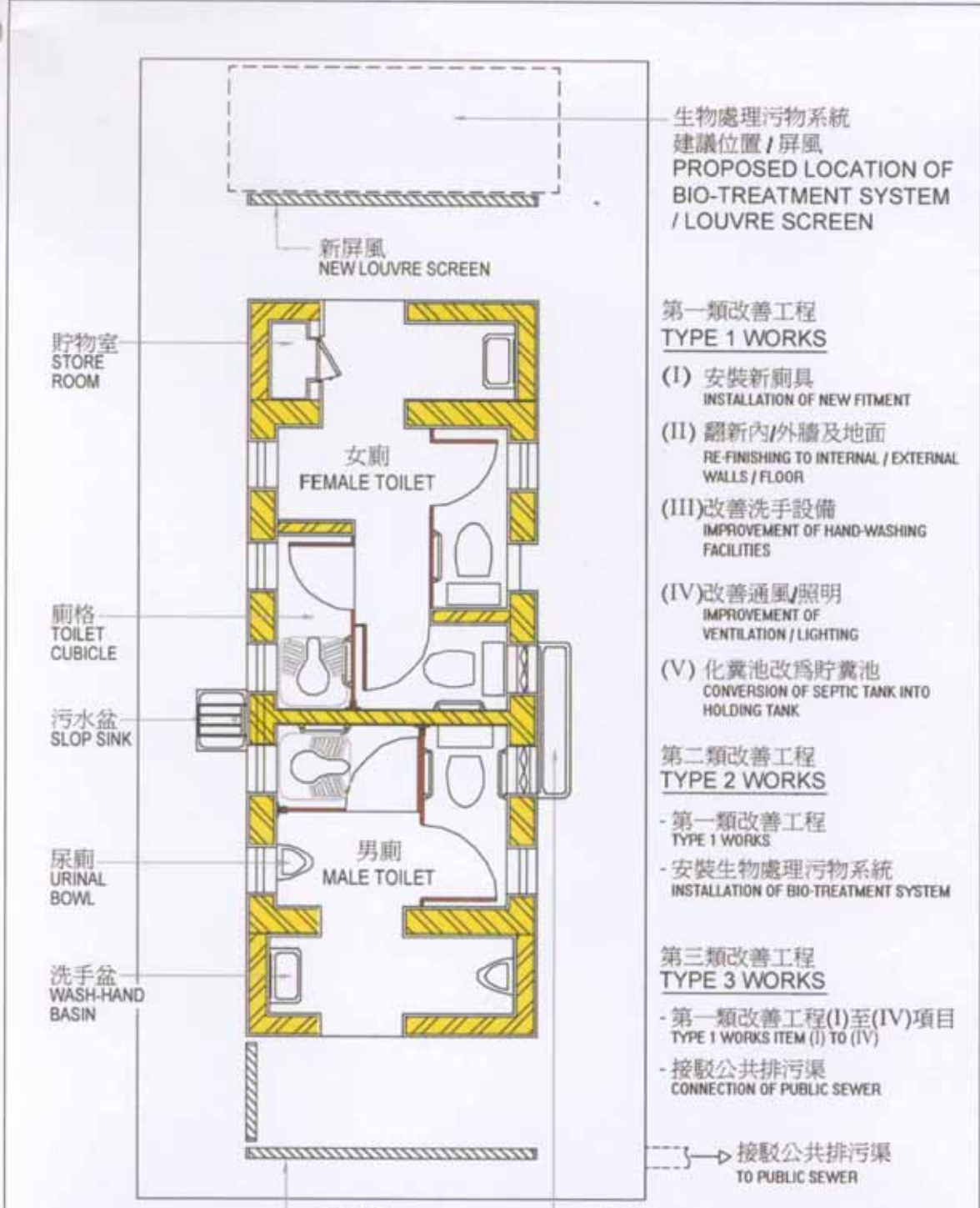
**Islands District**

1. Lutheran Village Site I, Cheung Chau
2. Tai Kwai Wan , Cheung Chau
3. Wai Tsai Street, Peng Chau



現有旱廁佈置圖  
EXISTING AQUA PRIVY LAYOUT

title 8NT 把旱廁改為沖水式廁所 - 第2B期 CONVERSION OF AQUA PRIVIES INTO FLUSHING TOILETS - PHASE 2B	drawn by BILLY CHOW	date 06.05.05	drawing no. AB/7012/P2B/XA102	scale 1:50
	approved K WONG	date 06.05.05	 ARCHITECTURAL SERVICES DEPARTMENT	
	office ARCHITECTURAL BRANCH			



建議新公廁設計  
TYPICAL SCHEMATIC LAYOUT PROPOSAL

生物處理污物系統  
建議位置 / 屏風  
PROPOSED LOCATION OF  
BIO-TREATMENT SYSTEM  
/ LOUVRE SCREEN

第一類改善工程  
TYPE 1 WORKS

- (I) 安裝新廁具  
INSTALLATION OF NEW FITMENT
- (II) 翻新內/外牆及地面  
RE-FINISHING TO INTERNAL / EXTERNAL  
WALLS / FLOOR
- (III) 改善洗手設備  
IMPROVEMENT OF HAND-WASHING  
FACILITIES
- (IV) 改善通風/照明  
IMPROVEMENT OF  
VENTILATION / LIGHTING
- (V) 化糞池改為貯糞池  
CONVERSION OF SEPTIC TANK INTO  
HOLDING TANK


第二類改善工程  
TYPE 2 WORKS

- 第一類改善工程  
TYPE 1 WORKS
- 安裝生物處理污物系統  
INSTALLATION OF BIO-TREATMENT SYSTEM

第三類改善工程  
TYPE 3 WORKS

- 第一類改善工程(I)至(IV)項目  
TYPE 1 WORKS ITEM (I) TO (IV)
- 接駁公共排污渠  
CONNECTION OF PUBLIC SEWER

接駁公共排污渠  
TO PUBLIC SEWER


title BNT 把旱廁改為沖水式廁所 - 第2B期 CONVERSION OF AQUA PRIVIES INTO FLUSHING TOILETS - PHASE 2B	drawn by BILLY CHOW	date 06.05.05	drawing no. AB/7012/P2B/XA103	scale 1:50
	approved K WONG	date 06.05.05	 ARCHITECTURAL SERVICES DEPARTMENT	
	office ARCHITECTURAL BRANCH			



廁所改善後之內貌  
INTERIOR VIEW OF TOILET AFTER IMPROVEMENT



廁所改善後之外貌  
EXTERIOR VIEW OF TOILET AFTER IMPROVEMENT

title 8NT 把旱廁改爲沖水式廁所 - 第2B期 CONVERSION OF AQUA PRIVIES INTO FLUSHING TOILETS - PHASE 2B	drawn by BILLY CHOW	date 06.05.05	drawing no. AB/7012/P2B/XA104	scale NTS
	approved K WONG	date 06.05.05	 ARCHITECTURAL SERVICES DEPARTMENT	
	office ARCHITECTURAL BRANCH			

**8NT – Conversion of aqua privies into flushing toilets – phase 2B**

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

		<b>Estimated man- Months</b>	<b>Average MPS* salary point</b>	<b>Multiplier (Note 1)</b>	<b>Estimated fee (\$ million)</b>
<b>Consultants' staff costs</b>					
(a) Contract	Professional	7.4	38	2.0	0.8
administration (Note 2)	Technical	19.4	14	2.0	0.7
<b>Total</b>					1.5

\*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 consultant's overheads and profit, as the staff will be employed in the consultant's office. (As at 1 January 2005, MPS point 38 = \$54,255 per month and MPS point 14 = \$18,010 per month.)
2. We will only know the actual man-months and actual fees after we have selected the consultant through the usual competitive bidding system.