

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

### **HEAD 703 – BUILDINGS**

#### **Environmental Hygiene - Toilets and bathhouses**

#### **6NT – Conversion of aqua privies into flushing toilets – phase 1**

Members are invited to recommend to Finance Committee the upgrading of 6NT to Category A at an estimated cost of \$26.6 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 (D Arch S), with the support of the Secretary for Health, Welfare and Food, proposes to upgrade 6NT to Category A at an estimated cost of \$26.6 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 into flushing toilets. In order to speed up the implementation programme, we intend to implement the conversion works in phases. Phase 1 of the project, which we now propose to upgrade to Category A, covers 30 of the 100 aqua privies which are of heavy usage or located at popular sightseeing spots. The conversion works under phase 1 are classified into the following three types –

- (a) **Type 1 – General refurbishment works at 23 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) **Type 2 – Installation of the bio-toilet system at five locations, including**
  - (i) general refurbishment works under Type 1; and
  - (ii) installation of a proprietary bio-treatment system to treat the wastes by a biological process and to recirculate the treated effluent for flushing purpose.
- (c) **Type 3 – Connection with public sewerage at two 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.

4. 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 23 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 bio-treatment plants (as indicated in Enclosure 1). For the two Type 3 aqua privies, as nearby public sewer is available, we will connect their underground drains to the public sewer.

5. A list of the 30 aqua privies is at Enclosure 1. 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 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 December 2004. 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 in the second half of 2006.

6. We aim to convert the remaining 70 aqua privies in two phases for completion by early 2007 and end 2007 respectively.

## JUSTIFICATION

7. At present, no flushing system is provided to the existing aqua privies. 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 and fungi, reducing the volume of sludge 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 and odour problems, especially inside toilet compartments. Hence, septic tanks are not the desirable sewage discharge/treatment system for public latrines and toilets with high usage rates.

8. The growing popularity of some sightseeing spots in the New Territories and outlying islands strongly calls for the upgrading of the existing aqua privies into 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 sightseeing spots or in locations with high usage rates, in order to improve the hygiene conditions and to enhance the standard of public toilet facilities.

## FINANCIAL IMPLICATIONS

9. We estimate the cost of **6NT** to be \$26.6 million in MOD prices, made up as follows –

	<b>\$ million</b>
(a) Site preparation	1.8
(b) Building	9.1
(c) Building services	4.5
(d) Drainage and external works	8.7
(e) Consultants' fee for contract administration	1.1
(f) Contingencies	2.5
Sub-total	27.7 (in September 2003 prices)
(g) Provision for price adjustment	(1.1)
Total	26.6 (in MOD prices)

D Arch S proposes to engage consultants to undertake contract administration of the project. A detailed breakdown of the estimate for the consultants' fee by man-months is at Enclosure 5. The construction floor area (CFA) of the 30 aqua privies is about 1 750 square metres (m<sup>2</sup>). The estimated construction unit cost, represented by the building and the building services costs, is \$7,771 per m<sup>2</sup> of CFA in September 2003 prices. D Arch S considers the estimated cost of **6NT** reasonable as compared with similar projects implemented by the Government.

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

Year	\$ million (Sept 2003)	Price adjustment factor	\$ million (MOD)
2004 – 05	5.1	0.97150	5.0
2005 – 06	13.1	0.95450	12.5
2006 – 07	6.8	0.95450	6.5
2007 – 08	2.7	0.96643	2.6
	27.7		26.6

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 2004 to 2008. We intend to award the contract on a lump-sum basis because we can clearly define the scope of the works in advance, leaving little room for uncertainty. The contract will not provide for price adjustment because the contract period will not exceed 21 months.

12. The annual recurrent expenditure for the 30 aqua privies will increase from \$1.1 million to \$2.8 million upon completion of the project.

**PUBLIC CONSULTATION**

13. We consulted the Legislative Council Panel on Food Safety and Environmental Hygiene on this project in November 2003. Members generally supported the project. We also consulted various District Councils on the projects in their respective districts in March and April 2004 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

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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 have considered measures to reduce the generation of construction and demolition (C&D) materials. D Arch S has introduced 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. D Arch S 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. D Arch S will ensure that the day-to-day operations on site comply with the approved WMP. D Arch S will control the disposal of public fill and C&D waste to designated public filling facilities and landfills respectively through a trip-ticket system. D Arch S 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 195 cubic metres ( $m^3$ ) of C&D materials. Of these, we will reuse about 58  $m^3$  (30%) on site, 107  $m^3$  (55%) as fill in public filling areas<sup>1</sup>, and dispose of 30  $m^3$  (15%) at landfills. The notional cost of accommodating C&D waste at landfill sites is estimated to be \$3,750 for this project (based on a notional unit cost<sup>2</sup> of \$125/ $m^3$ ).

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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.

<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/ $m^3$ ), 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**

18. The project does not require land acquisition.

**BACKGROUND INFORMATION**

19. We upgraded **6NT** to Category B in May 2004. We engaged consultants to carry out detailed design and tender documentation at a total cost of \$0.5 million. We charged 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”. The consultant has completed the detailed design of the project and the other consultant is finalizing the tender documents. D Arch S has 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.

21. We estimate that the proposed works will create about 50 jobs (42 for labourers and another eight for professional/technical staff) providing a total employment of 700 man-months.

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Health, Welfare and Food Bureau  
June 2004

**6NT – Conversion of aqua privies into flushing toilets – phase 1**

**Locations of aqua privies**

**A. Locations of 23 aqua privies to be converted under Type 1 works**

**Islands District**

1. Lower Tong Fuk Village, Lantau Island
2. Shui Hau, Lantau Island
3. Law Uk Village, Lantau Island

**North District**

1. Ma Wat Tsuen, Fanling
2. Lo Wai, Fanling
3. Luk Keng, Sha Tau Kok
4. Nam Chung, Sha Tau Kok
5. Lai Chi Wo, Sha Tau Kok
6. Wu Kau Tan, Sha Tau Kok

**Sai Kung District**

1. Pak Sha Wan Carpark
2. Sha Kiu
3. Tai Po Tsai
4. Tseng Lan Shue
5. Tai Mong Tsai

**Tai Po District**

1. Tap Mun Ha Wai
2. Tap Mun New Fisherman's Village Site I
3. Tap Mun New Fisherman's Village Site III
4. Wong Yee Au Village

**Tsuen Wan District**

1. Ku Hang Village

**Tuen Mun District**

1. Chung Uk Tsuen
2. Tsing Chuen Wai

**Yuen Long District**

1. Shap Pat Heung Choi Uk Tsuen
2. Pok Wai Tsuen



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

**North District**

1. Kat O Island, Sha Tau Kok

**Tai Po District**

1. Tap Mun Pier

**Yuen Long District**

1. Ping Shan Heritage Trail
2. Kam Tin Yuen Kong Tsuen
3. Sheung Tsuen Ku Miu

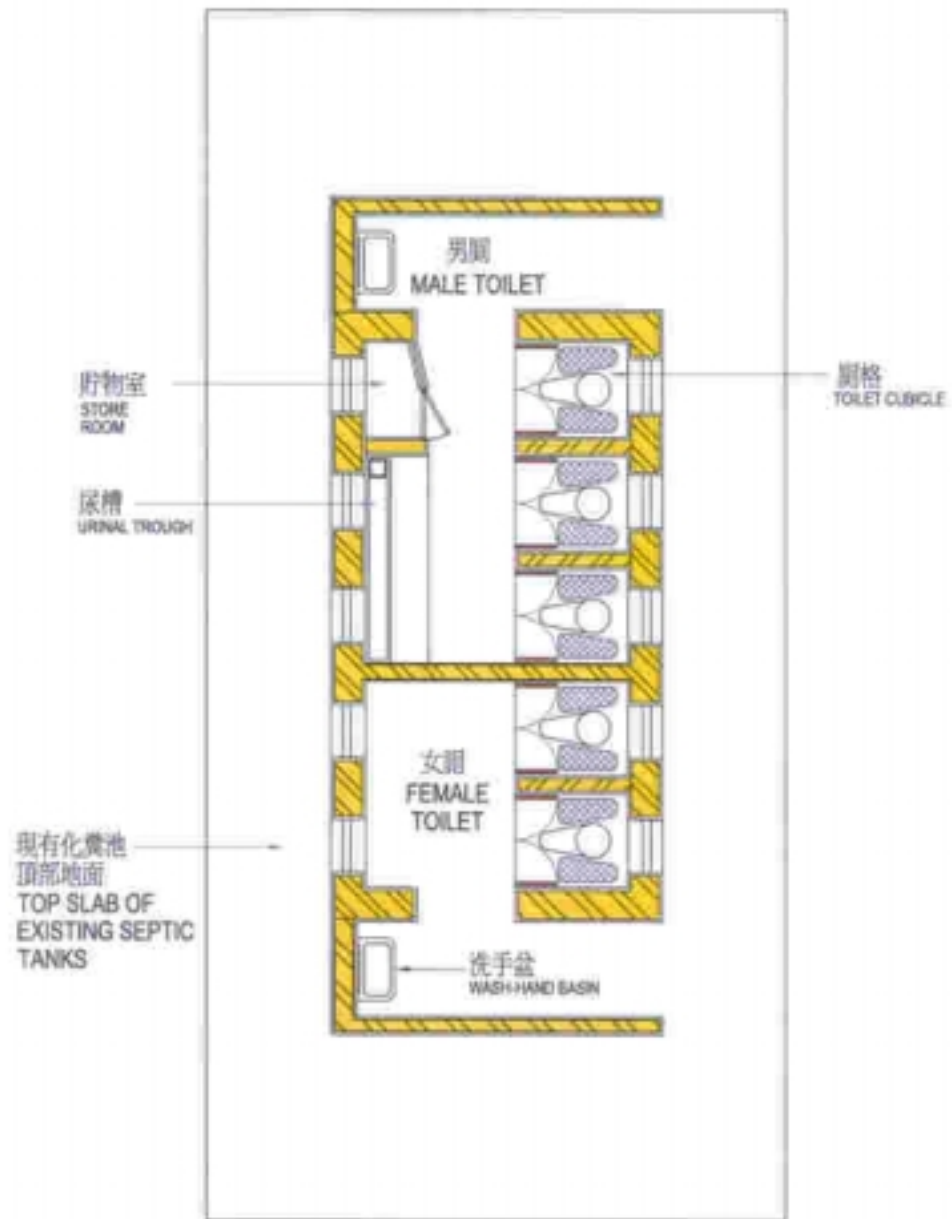
**C. Locations of two aqua privies to be converted under Type 3 works**

**Tsuen Wan District**

1. Fu Yung Shan San Tsuen

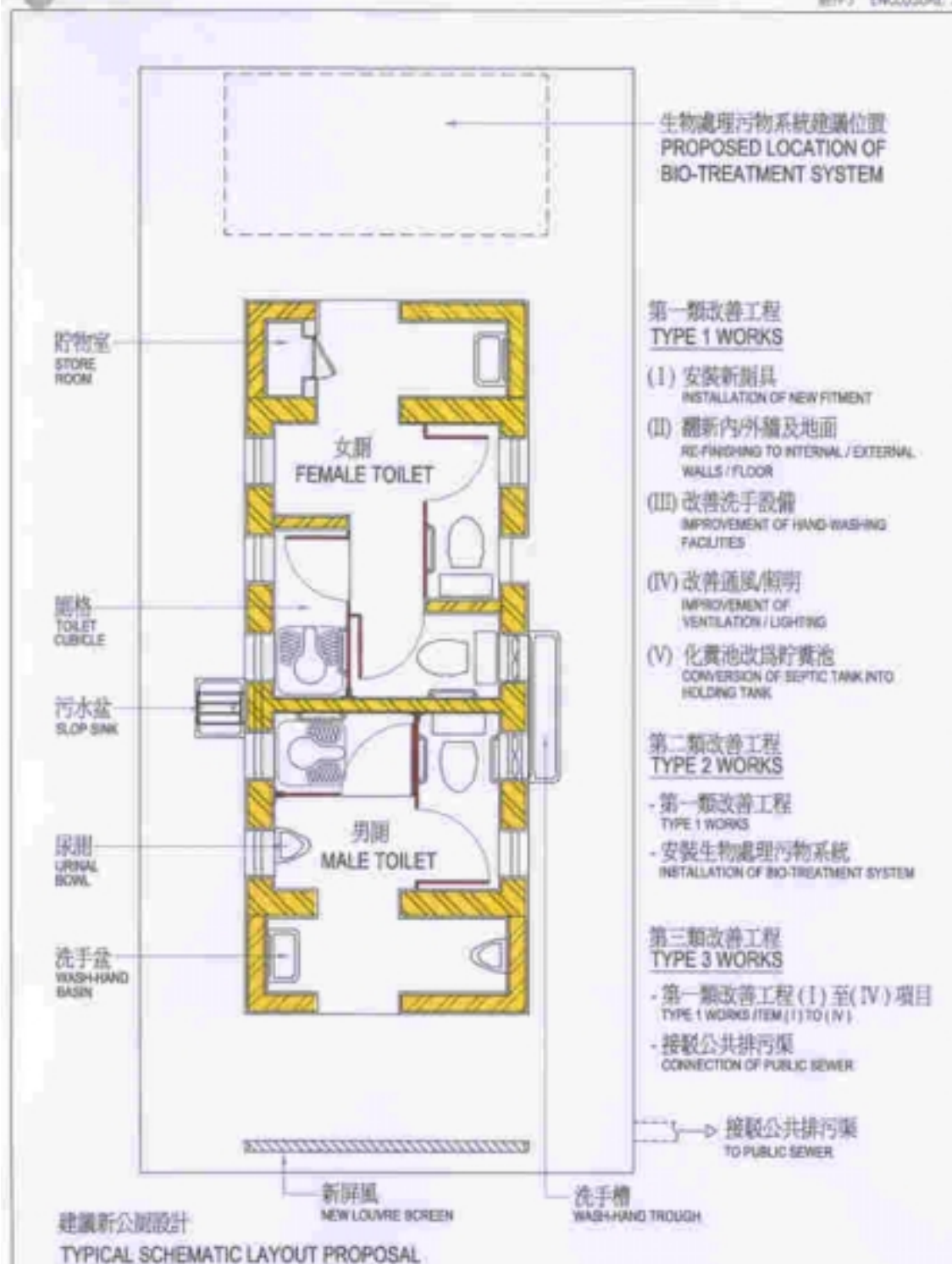
**Tuen Mun District**


1. San Hing Tsuen



現有旱廁佈置圖  
EXISTING AQUA PRIVY LAYOUT

title 把旱廁改為沖水式廁所-第一期 CONVERSION OF AQUA PRIVIES INTO FLUSHING TOILETS - PHASE 1	drawn by W.H. WU	date 11,6,04	drawing no. AB/6901/XA102	scale 1:50
	approved KEN WONG	date 11,6,04	 ARCHITECTURAL SERVICES DEPARTMENT	
	office ARCHITECTURAL BRANCH			



title 6M 把旱廁改為沖水式廁所-第一期 CONVERSION OF AQUA PRIVES INTO FLUSHING TOILETS - PHASE 1	drawn by W.H. WU	date 11.6.04	drawing no. AB/6901/TFS/XA103	scale 1:50
	approved KEN WONG	date 11.6.04	 ARCHITECTURAL SERVICES DEPARTMENT	
	office ARCHITECTURAL BRANCH			

附件4 ENCLOSURE 4



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

EIDa 0NT 把旱廁改為沖水式廁所-第一期 CONVERSION OF AQUA PRIVES INTO FLUSHING TOILETS - PHASE 1	drawn by TF LAW	date 11,6,04	drawing no. AB/6901/XA104	scale NTS
	approved KEN WONG	date 11,6,04	 ARCHITECTURAL SERVICES DEPARTMENT	
	office ARCHITECTURAL BRANCH			

**6NT – Conversion of aqua privies into flushing toilets – phase 1**

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

<b>Consultants' staff cost</b>		<b>Estimated man-months</b>	<b>Average MPS* salary point</b>	<b>Multiplier</b> <small>(Note 1)</small>	<b>Estimated fee</b> <b>(\$ million)</b>
(a) Contract administration <small>(Note 2)</small>	Professional	–	–	–	0.7
	Technical	–	–	–	0.4
				<b>Total</b>	1.1

\* MPS = Master Pay Scale

**Notes**

1. A multiplier of 1.6 is applied to the average MPS point to estimate the cost of resident site staff supplied by the consultants. (As at 1 January 2004, MPS point 38 = \$55,993 per month and MPS point 14 = \$18,603 per month.)
2. The consultants' staff cost for contract administration is calculated in accordance with the existing consultancy agreement for the design and construction of 6NT. The assignment will only be executed subject to Finance Committee's approval to upgrade 6NT to Category A.