For discussion **PWSC(2007-08)36**
on 20 June 2007

ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

HEAD 703 – BUILDINGS
Environmental Hygiene – Toilets and bathhouses
9NT – Conversion of aqua privies into flushing toilets – phase 3
10NT – Conversion of aqua privies into flushing toilets – phase 4

Members are invited to recommend to Finance Committee –

(a) the upgrading of **9NT** to Category A at an estimated cost of $66.0 million in money-of-the-day (MOD) prices for the conversion of 30 aqua privies into flushing toilets; and

(b) the upgrading of **10NT** to Category A at an estimated cost of $42.6 million in MOD prices for the conversion of 20 aqua privies into flushing toilets.

PROBLEM

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

/PROPOSAL .....

PROPOSAL

2. The Director of Architectural Services, with the support of the Secretary for Health, Welfare and Food, proposes to upgrade the following projects to Category A -

			Estimated cost (in MOD prices)
(a)	**9NT**	Conversion of aqua privies into flushing toilets – phase 3	$66.0 million
(b)	**10NT**	Conversion of aqua privies into flushing toilets – phase 4	$42.6 million

PROJECT SCOPE AND NATURE

3. Our objective is to convert aqua privies of relatively higher usage rate or located at popular scenic spots and tourist attractions into flushing toilets. To speed up the conversion programme, we have been implementing the conversion works for 100 aqua privies in different locations in the New Territories and outlying islands by phases under phase 1 (**6NT**), phase 2A (**7NT**) and phase 2B (**8NT**). We have commenced **6NT** for the conversion of 30 aqua privies starting from early 2005 and the conversion works for the 30 aqua privies have already been completed. We have also commenced **7NT** and **8NT** for the conversion works of the remaining 70 aqua privies by batches starting from end 2005 and early 2006 respectively and aim to complete the entire conversion project on 100 aqua privies by late 2007.

4. To further speed up the conversion process to meet public demand and as a continued effort to improve the environmental hygiene of Hong Kong, conversion works will be extended to another 30 and 20 aqua privies under phase 3 (**9NT)** and phase 4 (**10NT**) respectively. The conversion programme of these 50 aqua privies are separated into two phases because we originally planned to implement phase 3 first upon the completion of the current conversion programme. By the adoption of standard design now for the conversion works and a new term contract tender for these 50 aqua privies, it would be more efficient and cost effective for both **9NT** and **10NT** to be carried out at the same time. Therefore, we are able to advance the programme of **10NT** to tie in with that for **9NT**.

/5. .....

5. The list of 30 and 20 aqua privies covered by phase 3 and phase 4 are at Enclosures 1 and 2. The conversion works under phase 3 and phase 4 are classified into the following three types -

(a) **Type 1 – General refurbishment works at 16 locations in phase 3 and 14 locations in phase 4, 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 newly introduced bio-treatment system at 11 locations in phase 3 and five locations in phase 4, 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) .....

(c) **Type 3 – Connection with public sewerage at three locations in phase 3 and one location in Phase 4, 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.

6. 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 Type 1 aqua privies without bio-treatment plant, we will arrange more frequent tankering away of waste. For the Type 2 aqua privies where sufficient space is available within the existing site area and the site conditions permit, we will install the newly introduced bio-treatment plants. For the Type 3 aqua privies, as nearby public sewer is available, we will connect their underground drains to the public sewer. The aqua privies under phase 3 and phase 4 and the conversion method recommended for each aqua privy may be subject to change in case of unforeseen circumstances and we will consider selecting other suitable aqua privies to replace those aqua privies which cannot be implemented due to such reason.

7. The layout plans of a typical aqua privy and a flushing toilet converted from an aqua privy are at Enclosure 3 and Enclosure 4 respectively. Exterior and interior views of the toilet after the completion of the proposed conversion works are at Enclosure 5. We plan to carry out the proposed conversion works under **9NT** and **10NT** in batches starting from November 2007 for completion of the entire project by May 2009. 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.

/**JUSTIFICATION** .....

JUSTIFICATION

8. 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 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 desirable public toilet facilities. The upgrading of the existing aqua privies to flushing toilets with proper hand-washing facilities at locations of relatively higher usage rate or popular scenic spots and tourist attractions will improve the hygiene conditions, eliminate odour and pest problems arising from the conventional design of aqua privies and upgrade the standard of provision of toilet facilities.

9. Furthermore, as most part of the New Territories districts are becoming more urbanised, there is a need to bring about long-term improvement to the toilet facilities in these districts. It is our policy intent to convert all aqua privies in the territory wherever resources and circumstances permit and to expedite the conversion programme for completion in five to six years.

FINANCIAL IMPLICATIONS

10. We estimate the capital costs of **9NT** and **10NT** to be $66.0 million and $42.6 million respectively in MOD prices (see paragraph 11 below), made up as follows –

	$ million	
	9NT	**10NT**
(a) Site preparation	7.1	5.2
(b) Building	14.0	10.9

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		$ million		
(c)	Building services	8.0	5.3	
(d)	Drainage	24.0	12.4	
(e)	External works	3.2	2.5	
(f)	Consultants' fees for -	1.5	1.0	
	(i) Contract administration	1.2	0.8	
	(ii) Site supervision	0.3	0.2	
(g)	Provision of temporary portable toilets	1.3	0.9	
(h)	Contingencies	5.9	3.8	
	Sub-total	65.0	42.0	(in September 2006 prices)
(i)	Provision for price adjustment	1.0	0.6	
	Total	66.0	42.6	(in MOD prices)

We propose to engage consultants to undertake contract administration and site supervision of the project. A detailed breakdown of the estimate for consultants' fee by man-month is at Enclosure 6. The construction floor area (CFAs) of the **9NT** and **10NT** are about 2 616 and 1 962 square metres (m^2) respectively. The estimated construction unit costs of **9NT** and **10NT**, represented by the building and the building services costs, are $8,410 per m^2 and $8,257 per m^2 of CFA in September 2006 prices. We consider this unit cost reasonable as compared with similar projects implemented by the Government.

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

Year	$ million (Sept 2006)		Price adjustment factor	$ million (MOD)	
	9NT	**10NT**		**9NT**	**10NT**
2007 – 08	5.0	0.5	0.99900	5.0	0.5
2008 – 09	22.0	20.0	1.00649	22.1	20.1
2009 – 10	17.0	11.0	1.01656	17.3	11.2
2010 – 11	12.0	7.0	1.02672	12.3	7.2
2011 – 12	9.0	3.5	1.03699	9.3	3.6
	65.0	42.0		66.0	42.6

12. 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 2007 to 2012. We intend to deliver the proposed works under a design and construction term contract. The contract is specially created to meet the needs of the phased conversion programme of aqua privies into flushing toilets including phase 3 and 4 as well as future phases. This is a 36-month re-measurement contract with provision for price adjustments.

13. Upon completion of the project, the annual recurrent expenditure for the 50 aqua privies under phases 3 and 4 will be about $4.6 million.

PUBLIC CONSULTATION

14. We circulated an information paper to the Legislative Council Panel on Food Safety and Environmental Hygiene on the conversion project on 50 aqua privies under **9NT** and **10NT** in 8 May 2007. Members did not raise any objection to the proposal.

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15. We consulted all relevant District Councils or their subcommittees between November 2006 and May 2007. They all supported the proposed conversion works. A list of the District Councils and subcommittees consulted is at Enclosure 7.

ENVIRONMENTAL IMPLICATIONS

16. The project is not a designated project under the Environmental Impact Assessment Ordinance and will not cause long term environmental impact. We have included in the project estimates the cost to implement suitable mitigation measures to control short term environmental impacts.

17. 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.

18. We have considered measures in the planning and design stages to reduce the generation of construction and demolition (C&D) materials where possible. These include the use of prefabricated building elements such as steel frame construction, proprietary toilet partitions, counter top, wall finishes, and fittings and fixtures to reduce temporary formwork and construction waste. We will reduce demolition and thereby off-site disposal by retaining the existing construction and structures of the aqua privies as far as possible. We will reuse inert C&D materials on site or in other suitable construction sites as far as possible (e.g. the use of excavated materials for filling within the site, the use of metal hoardings and signboards so that these materials can be recycled or reused in other sites), in order to minimise the disposal of C&D materials at public fill reception facilities[1]. We will encourage the contractor to maximise the use of recycled or recyclable C&D materials, as well as the use of non-timber formwork to further minimise the generation of construction waste.

/19. .....

[1] Public fill reception facilities are specified in Schedule 4 of the Waste Disposal (Charges for Disposal of Construction Waste) Regulation. Disposal of public fill at public fill reception facilities requires a licence issued by the Director of Civil Engineering and Development.

19. We will also 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, C&D materials and C&D waste at public fill reception 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.

20. We estimate that the projects will generate the following C&D materials –

	9NT		**10NT**	
	tonnes	**%**	**tonnes**	**%**
C&D materials reused / recycled on site	100.0	31.2	80.0	33.3
C&D materials to public fill reception facilities for subsequent reuse	190.0	59.4	140.0	58.3
C&D materials to landfills	30.0	9.4	20.0	8.4
Total C&D materials generated	320.0	100.0	240.0	100.0

The total cost for accommodating C&D materials at public fill reception facilities and landfill sites is estimated to be $8,880 for **9NT** and $6,280 for **10NT** (based on a unit cost of $27/tonne for disposal at public fill reception facilities and $125/tonne[2] at landfills).

/LAND .....

[2] 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.

LAND ACQUISITION

21. The project does not require any land acquisition.

BACKGROUND INFORMATION

22. We upgraded **9NT** and **10NT** to Category B in March 2006 and January 2007 respectively. We will engage a consultant to undertake tender documentation of the project at a total estimated cost of $1.0 million, 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 site investigation and sketch plans using in-house staff resources.

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

24. We estimate that the proposed works will create the following job opportunities -

	Professional / Technical staff	**Labourer**	**Total**	**Estimated total man-months**
9NT	10	95	105	1 600
10NT	7	60	67	1 000

Health, Welfare and Food Bureau
June 2007

Enclosure 1 to PWSC(2007-08)36

9NT – Conversion of aqua privies into flushing toilets – phase 3

Locations of aqua privies

A. Locations of 16 aqua privies to be converted under Type 1 works

Islands District

1. Ngong Ping Camp Site, Lantau

North District

1. Tan Chuk Hang
2. Lin Tong Mei
3. Sheung Shui Wai Sheung Pak Tsuen
4. San Uk Tsuen, Sheung Shui

Sai Kung District

1. Nam Wai Village

Tai Po District

1. San Tong
2. Lin Au

Yuen Long District

1. Ping Shan Tong Fong Tsuen
2. Ping Shan Hung Uk Tsuen
3. Tai Shu Ha
4. Wan Chau Tai Tseng Wai Tsuen
5. Lau Fau Shan Pak Nai near Vegetable Market Office
6. Ngau Hom Tsuen
7. Kam Tin Kam Hing Wai North
8. Ha Tsuen San Wai

B. Locations of 11 aqua privies to be converted under Type 2 works

Islands District

1. Hau Wong Temple, Tung Chung, Lantau
2. Mo Tat Village, Lamma

Shatin District

1. To Tau Village

Yuen Long District

1. Kam Tin Kat Hing Wai
2. Kam Tin Shui Mei Tsuen
3. Kam Tin Fung Kut Heung

4. Pat Heung Sheung Tsuen Wing Hing Wai
5. Ha Tsuen Tseung Kong Wai
6. Tai Shu Ha West
7. Lau Fau Shan Sheung Pak Nai Sha Kong Miu
8. Tai Tong Road Nam Hang Pai

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

North District

1. Queen's Hill, Fanling

Sai Kung District

1. Sun On Tsuen

Shatin District

1. Fo Tan Village

Enclosure 2 to PWSC(2007-08)36

10NT – Conversion of aqua privies into flushing toilets – phase 4

Locations of aqua privies

A. Locations of 14 aqua privies to be converted under Type 1 works

North District

1. Tam Shui Hang Village
2. Tong Hang Tsuen
3. Lin Tong Mei Residential Area
4. Liu Pok Tsuen (North)

Sai Kung District

1. Nam Shan Village

Tai Po District

1. Hang Ha Po
2. Wai Tau Tsuen

Tuen Mun District

1. Tuen Tsz Wai
2. Tuen Tsz Wai Lam Tei Vegetable Market Office

Yuen Long District

1. Shek Wu Wai
2. San Tin Fan Tin Tsuen (2)
3. Ping Shan Fung Chi Tsuen
4. Pat Heung Tin Sum Tsuen
5. Ha Tsuen Pau Wai

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

Islands District

1. San Tau, Tung Chung, Lantau
2. Yung Shue Ha, Sok Kwu Wan, Lamma

North District

1. Kam Tsin Tsuen (South)
2. Ling Shan Tsuen

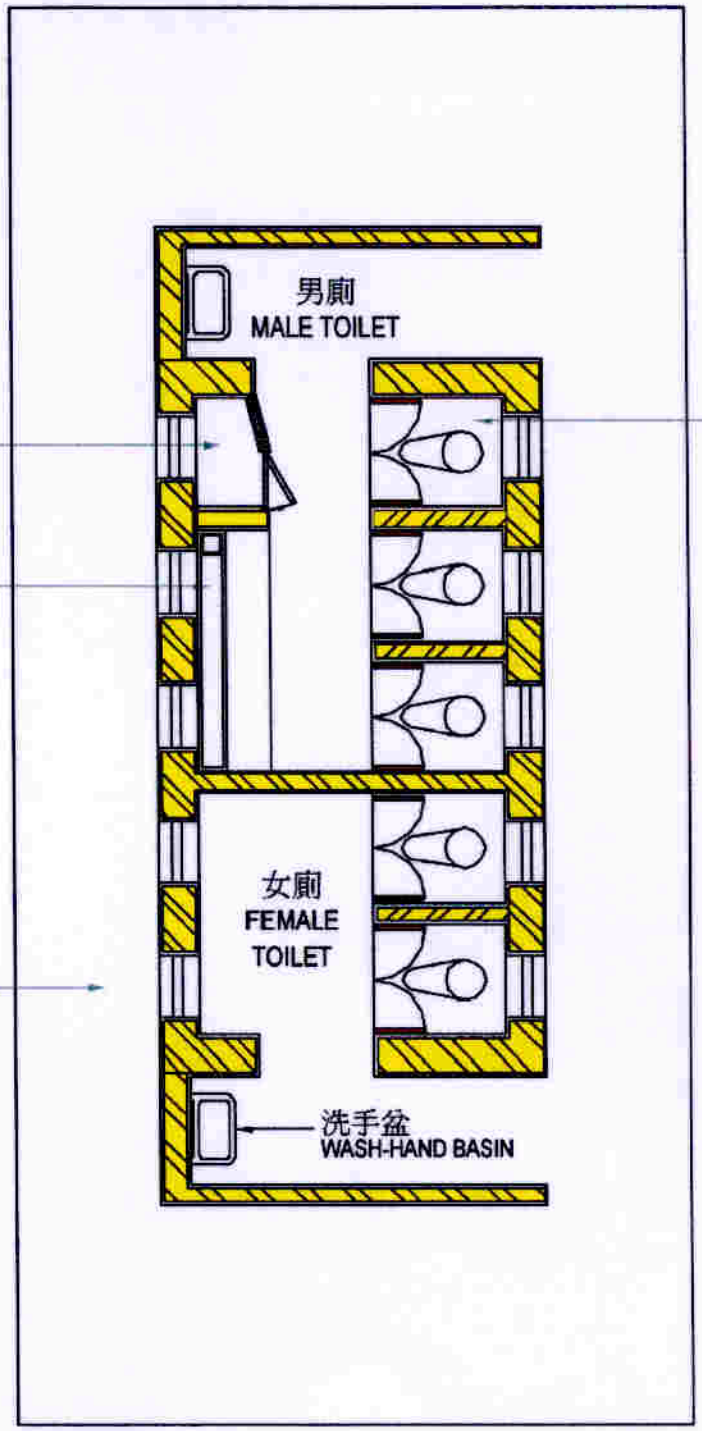
Yuen Long District

1. Lam Hau Tsuen

C. Location of one aqua privy to be converted under Type 3 works

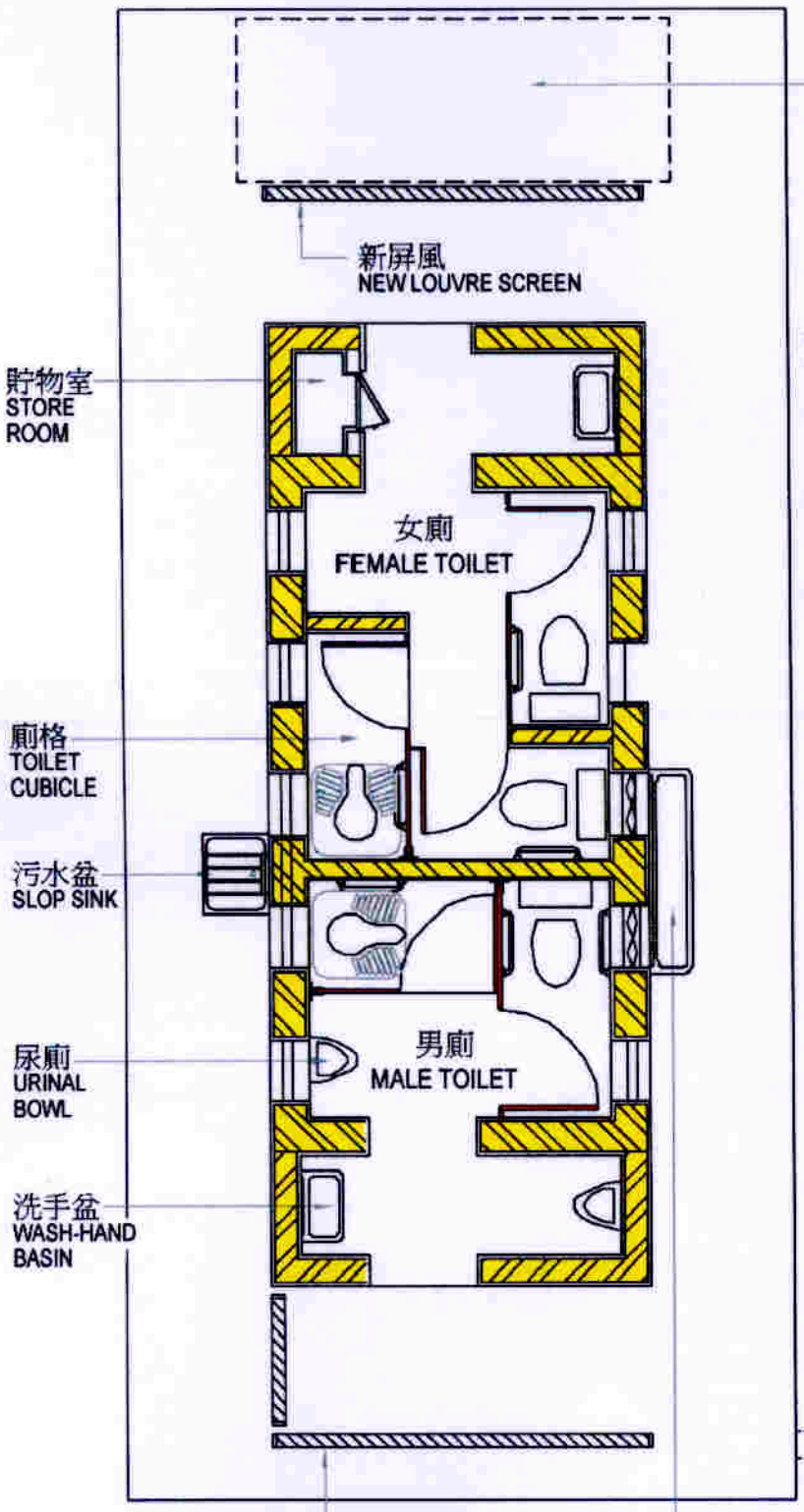
Islands District

1. Shek Tsai Po Street, Tai O, Lantau.



現有旱廁佈置圖
EXISTING AQUA PRIVY LAYOUT

title 9NT & 10NT 把旱廁改爲沖水式廁所 - 第3和4期 CONVERSION OF AQUA PRIVIES INTO FLUSHING TOILETS - PHASE 3&4	drawn by KENNETH HO	date 18.05.07	drawing no. AB/7178B/P3&P4/XA102	scale 1:50
	approved H.F.CHIN	date 18.05.07	ARCHITECTURAL SERVICES DEPARTMENT	
	office ARCHITECTURAL BRANCH			



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) 化糞池改爲貯糞池
CONVERSION OF SEPTIC TANK INTO HOLDING TANK

第二類改善工程
TYPE 2 WORKS

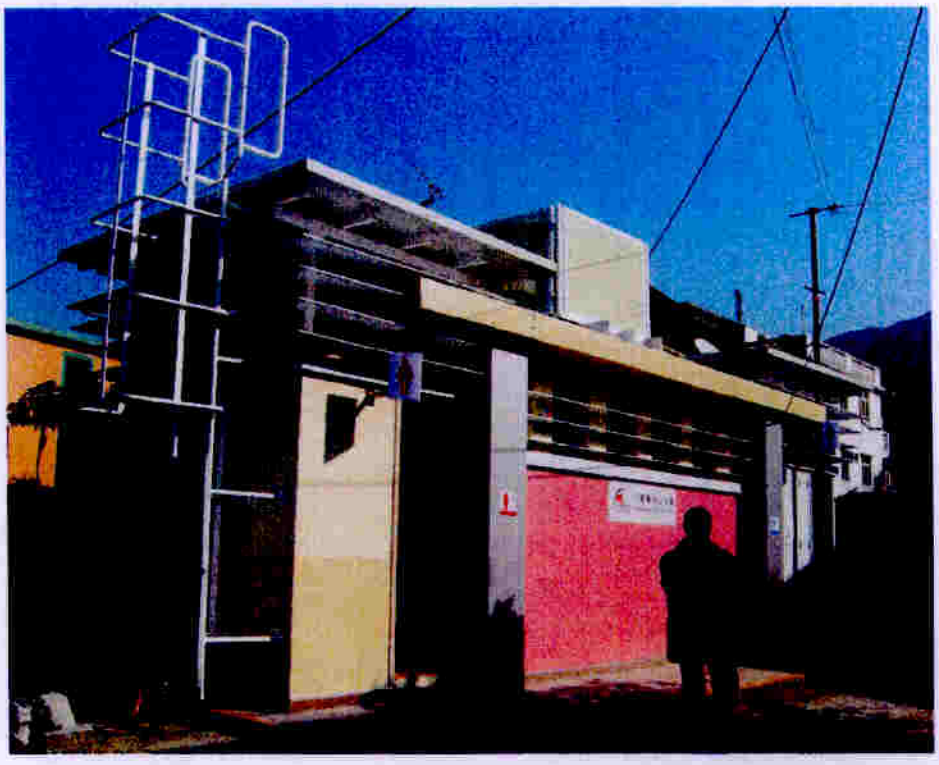
- 第一類改善工程
TYPE 1 WORKS
- 安裝生物處理污物系統
INSTALLATION OF BIO-TREATMENT SYSTEM

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

建議新公廁設計
TYPICAL SCHEMATIC LAYOUT PROPOSAL

title 9NT & 10NT 把旱廁改爲沖水式廁所 - 第3和4期 CONVERSION OF AQUA PRIVIES INTO FLUSHING TOILETS - PHASE 3&4	drawn by KENNETH HO	date 18.05.07	drawing no. AB/7178B/P3&P4/XA103	scale 1:50
	checked by H.F.CHIN	date 18.05.07	ARCHITECTURAL SERVICES DEPARTMENT	
	office ARCHITECTURAL BRANCH			



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

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

title 9NT & 10NT 把旱廁改爲沖水式廁所 - 第3和4期 CONVERSION OF AQUA PRIVIES INTO FLUSHING TOILETS - PHASE 3&4	drawn by KENNETH HO	date 18.05.07	drawing no. AB/7178B/P3&P4/XA104	scale NTS
	checked by H.F.CHIN	date 18.05.07	ARCHITECTURAL SERVICES DEPARTMENT	
	office ARCHITECTURAL BRANCH			

9NT – Conversion of aqua privies into flushing toilets – phase 3
10NT – Conversion of aqua privies into flushing toilets – phase 4

Breakdown of the estimate for consultants' fees

Consultants' staff costs		Estimated man-months		Average MPS* salary point	Multiplier (Note 1)	Estimated fee ($ million)	
		9NT	**10NT**			**9NT**	**10NT**
(a) Contract administration (Note 2)	Professional	6.5	4.5	38	2.0	0.7	0.5
	Technical	14	8.5	14	2.0	0.5	0.3
(b) Site supervision (Note 2)	Professional	2.5	1.5	38	1.6	0.2	0.1
	Technical	3.5	2.5	14	1.6	0.1	0.1
					Total	1.5	1.0

* 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. A multiplier of 1.6 is also applied to the average MPS point to estimate the cost of resident site staff supplied by the consultants. (As at 1 January 2007, 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 of **9NT** and **10NT** through the usual competitive bidding system and completion of the construction works.

9NT – Conversion of aqua privies into flushing toilets – phase 3
9NT – 把旱廁改為沖水式廁所－第 3 期

10NT – Conversion of aqua privies into flushing toilets – phase 4
10NT – 把旱廁改為沖水式廁所－第 4 期

List of District Councils / Subcommittees Consulted
所諮詢的相關的區議會或其轄下相關的委員會

District **區**	**District Councils / Subcommittees Consulted** **所諮詢的相關的區議會或其轄下相關的委員會**	**Date of Consultation** **諮詢日期**
Islands 離島區	Environmental Improvement and Food Hygiene Committee 環境改善及食物衞生委員會	27.11.2006 26.3.2007
North 北區	District Development & Environmental Improvement Committee 地區發展及環境改善委員會	20.11.2006 30.1.2007 14.5.2007
Sai Kung 西貢區	Sai Kung District Council 西貢區議會	5.12.2006
Shatin 沙田區	Health and Environment Committee 衞生及環境委員會	14.11.2006
Tai Po 大埔區	Environment, Housing and Works Committee 環境、房屋及工程委員會	17.11.2006
Yuen Long 元朗區	Environmental Improvement Committee 環境改善委員會	20.11.2006 12.3.2007 21.5.2007
Tuen Mun 屯門區	Environment, Hygiene and District Development Committee 環境、衞生及地區發展委員會	17.11.2006