For discussion **PWSC(2001-02)105**
on 27 February 2002

ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

HEAD 703 - BUILDINGS
Environmental Hygiene - Burial grounds, columbaria and crematoria
11NB - Replacement of cremators at Fu Shan Crematorium, Sha Tin

Members are invited to recommend to Finance Committee the upgrading of **11NB** to Category A at an estimated cost of $109.3 million in money-of-the-day prices for the replacement of two twin cremators at Fu Shan Crematorium.

PROBLEM

The two twin cremators at Fu Shan Crematorium are nearing the end of their serviceable life span and their performance is unsatisfactory.

PROPOSAL

2. The Director of Architectural Services (D Arch S), with the support of the Secretary for the Environment and Food, proposes to upgrade **11NB** to Category A at an estimated cost of $109.3 million in money-of-the-day (MOD) prices to replace the two existing twin cremators at the Fu Shan Crematorium by constructing a new cremation room with four single cremators and ancillary facilities at a location adjacent to the existing Crematorium building. The new cremators will be designed to meet the latest requirements in the Guidance Notes

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on the Best Practicable Means for Incinerators (Crematoria)[1] (the Guidance Notes) issued by the Environmental Protection Department (EPD) in 1998.

PROJECT SCOPE AND NATURE

3. **11NB** is phased as two stages of works so as to maintain the cremation services at Fu Shan Crematorium during the construction period. The scope of the project comprises -

(a) Stage 1

(i) construction of a new cremation room with four single cremators of 513 square metres in gross floor area;

(ii) renovation of the existing pulverising room;

(iii) provision of an automatic coffin delivery system which occupies part of the old cremation room;

(iv) alteration and renovation of the two existing service halls for the provision of catafalques with electric transfer belts to facilitate the transfer of coffins between the halls and the new cremation room;

(v) reprovisioning of the existing public toilet displaced by the new cremation room;

(vi) provision of emergency generator room, main switch room, pump room, fire services tank, and storeroom;

(vii) re-alignment of the existing emergency vehicular access; and

(viii) reprovisioning of 16 car parking spaces and landscaped area displaced by the new cremation room;

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[1] This note was issued by the EPD as one in a series to provide guidance for processes specified under Part IV of the Air Pollution Control Ordinance. The note sets out the basic requirement for the applicant to provide and maintain the best practicable means for the prevention of the emission of air pollutants arising from crematoria.

(b) Stage 2

(i) demolition and removal of the old cremators after commissioning of the new ones;

(ii) renovation of the remaining part of the old cremation room into an operation storage area; and

(iii) upgrading of fire service installation in the existing crematorium premises to meet current fire safety standards.

4. A site plan is at the Enclosure. We plan to start the stage 1 works in August 2002 for completion in December 2003. Upon commissioning of the new cremators, we will begin the stage 2 works in April 2004 for completion in June 2004. A three-month period between completion of stage 1 and commencement of stage 2 is required for testing and commissioning the new cremators and staff training.

JUSTIFICATION

5. The existing cremators of the Fu Shan Crematorium were constructed in 1984. They have been in use for over 16 years and are nearing the end of their serviceable lives. The frequent repairs required in recent years have affected the provision of cremation services in the Crematorium.

6. Recently, there have been incidents of dark smoke emission from the cremators as a result of incomplete combustion of carbon particles in the cremation process. EPD and the Food and Environmental Hygiene Department (FEHD) have received complaints from residents in Sha Tin who are very concerned about the potential air pollution caused by the dark smoke.

7. In view of the above, we propose to replace the old cremators with new ones. The opportunity is also taken to upgrade the design of the cremators to the latest standard in respect of environmental protection. The new cremators will adopt the latest cremation technology and will be designed to meet the requirements in the Guidance Notes. They will be equipped with high temperature secondary combustion chambers to ensure complete combustion during the cremation process and a flue gas filtering system to filter particles and waste gases in the emissions from the cremators. These advanced features will mitigate the dark smoke emitted from the cremators of the Crematorium and address the local residents' concern.

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FINANCIAL IMPLICATIONS

8. We estimate the capital cost of the project to be $109.3 million in MOD prices (see paragraph 9 below), made up as follows -

		$ million	
(a)	Site works and demolition	0.6	
(b)	Geotechnical works	3.0	
(c)	Building	10.3	
(d)	Building services	6.0	
(e)	Drainage and external works	6.9	
(f)	Supply and installation of cremators, flue gas cleaning plant and supporting machinery	64.0	
(g)	Alteration and renovation of the existing cremation rooms and service halls	7.3	
(h)	Furniture and equipment[2]	0.3	
(i)	Contingencies	9.8	
	Sub-total	108.2	(in September 2001 prices)
(j)	Provision for price adjustment	1.1	
	Total	109.3	(in MOD prices)

The construction floor area (CFA) of **11NB** is 916 square metres. The estimated construction unit cost, represented by building and building services costs, is $17,795 per square metre of CFA in September 2001 prices. D Arch S considers the estimated construction unit cost comparable to similar projects built by the Government.

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[2] Based on the provision of furniture and equipment of existing crematoria and the market price of the items required.

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

Year	$ million (Sept 2001)	Price adjustment factor	$ million (MOD)
2002 - 03	8.0	0.99700	8.0
2003 - 04	39.0	1.00398	39.2
2004 - 05	43.0	1.01101	43.5
2005 - 06	12.0	1.01808	12.2
2006 - 07	6.2	1.02521	6.4
	108.2		109.3

10. We derived the MOD estimates on the basis of Government's latest forecast of trend labour and construction prices for the period 2002 to 2007. We will deliver the works through a fixed-price lump-sum contract because the contract period will be less than 21 months and we can clearly define the scope of works in advance, leaving little room for uncertainty.

11. We estimate the additional annual recurrent expenditure of the project to be $3.2 million.

PUBLIC CONSULTATION

12. FEHD presented details of the proposed project to the Health and Environment Committee of the Sha Tin District Council on 6 July 2000 and the Committee supported the project. The Sha Tin District Council ratified the Committee's decision at its full council meeting held on 28 July 2000.

13. We briefed the Legislative Council Panel on Food Safety and Environmental Hygiene on the project on 28 January 2002. Members had no adverse comments and requested early implementation of the project.

/ENVIRONMENTAL …..

ENVIRONMENTAL IMPLICATIONS

14. This is a designated project under Schedule 2 of the Environmental Impact Assessment (EIA) Ordinance (Cap. 499) and an environmental permit is required for the construction and operation of the project. In January 2002, the EIA report for the project was approved under the EIA Ordinance, and an environmental permit was also issued under the Ordinance. The EIA report concluded that environmental impact of the project was either minimal or could be controlled within the established standards.

15. We will implement the mitigation measures at both the construction and operation stages and the environmental monitoring and audit programme at the operation stage, as recommended in the approved EIA report. The design of the new cremators will adopt the latest control technology. Air emissions from the new cremators will meet the relevant criteria and the project will have no long-term adverse environmental impact. We will adopt a flue gas cleaning plant to control the quality of the gas emitted from the cremators. We will use gas as a clean source of fuel. The outdoor areas will be landscaped, including planting trees outside the new cremation room. Monitoring and audit of the air emissions from the new cremators will also be carried out by FEHD on a continuous basis. During construction, we will keep noise, dust and site runoff nuisances within established standards and guidelines through the implementation of mitigation measures in the relevant contracts. These include the use of silencers, mufflers, acoustic lining or shields for noisy construction activities, frequent cleaning and watering of the site, and the provision of wheel-washing facilities.

16. 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 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.

17. 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. The contractor will be required to separate public fill from C&D waste for disposal at appropriate facilities. We will record the disposal, reuse and recycling of C&D

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materials for monitoring purposes. We estimate that the project will generate about 250 cubic metres (m^3) of C&D materials. Of these, we will reuse about 25 m^3 (10%) on site, 190 m^3 (76%) as fill in public filling areas[3], and dispose of 35 m^3 (14%) at landfills. The notional cost of accommodating C&D waste at landfill sites is estimated to be $4,375 for this project (based on a notional unit cost[4] of $125/$m^3$).

18. The operation of the new cremators requires a specified process licence under the Air Pollution Control Ordinance. To obtain the licence, the operation process must satisfy the Guidance Notes issued by EPD.

LAND ACQUISITION

19. The project does not require land acquisition.

BACKGROUND INFORMATION

20. We upgraded **11NB** to Category B in October 2000. We employed a term contractor to carry out site investigation and topographical survey in June 2000 at a total cost of $258,000. We also engaged consultants to carry out a Preliminary Environmental Review (PER) and an EIA in September 2000 and December 2000 respectively at a total cost of $779,000. We charged these amounts to block allocation **Subhead 3100GX** "Project feasibility studies, minor investigations and consultants' fees for items in Category D of Public Works Programme". The term contractor and consultants have completed the site investigation, topographical survey, PER and EIA. D Arch S has completed the detailed design of the project and is preparing the tender documents with in-house staff resources.

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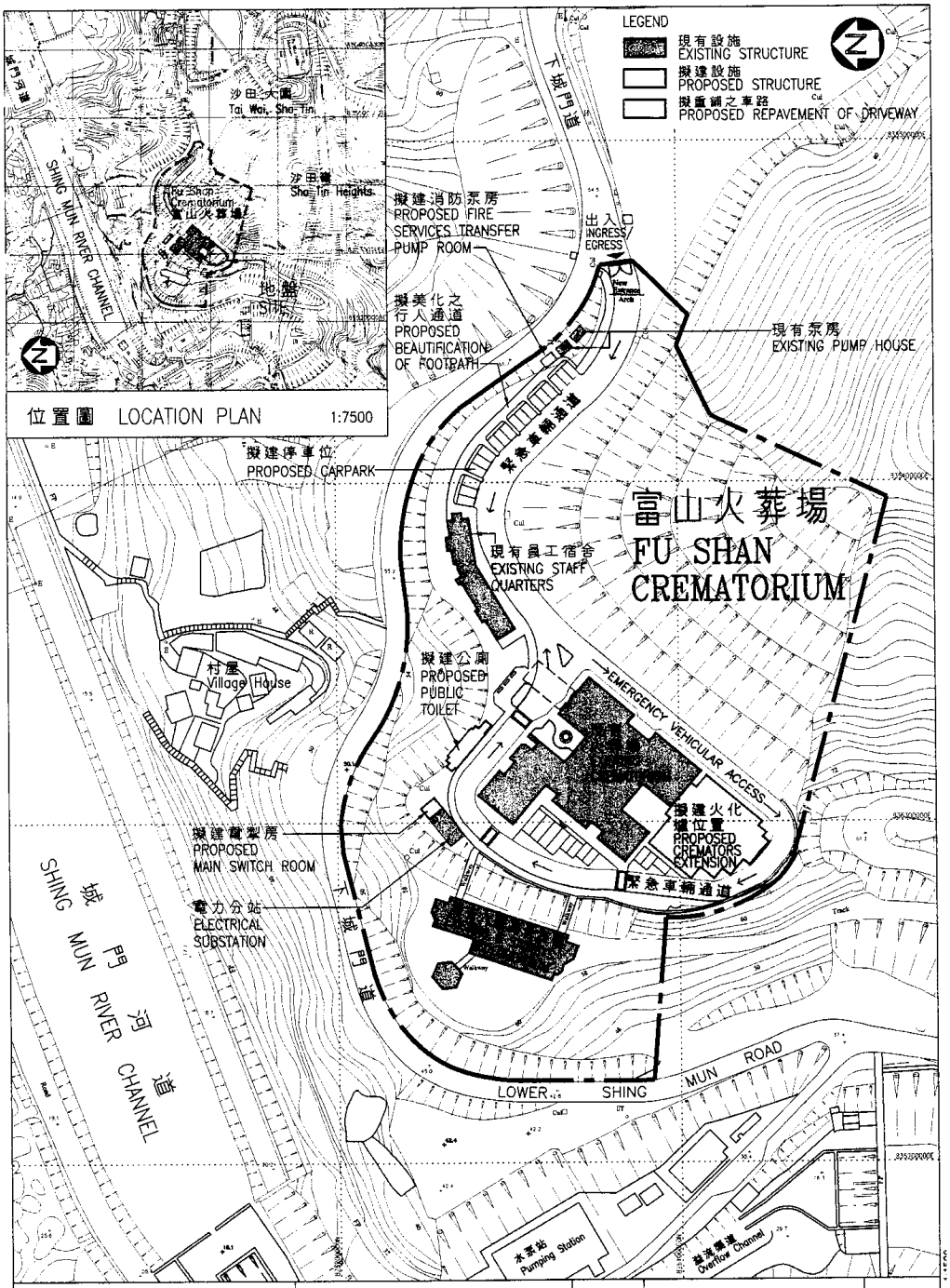
[3] A public filling area is a designated part of a development project that accepts public fill for reclamation purposes. Disposal of public fill in a public filling area requires a licence issued by the Director of Civil Engineering.

[4] 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^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.

21. We estimate that the project will create some 55 jobs with a total of 670 man-months comprising one professional staff, two technical staff and 52 labourers.

Environment and Food Bureau
February 2002

附件 ENCLOSURE



title 11NB 更換沙田富山火葬場的火化爐 REPLACEMENT OF CREMATORS AT FU SHAN CREMATORIUM, SHA TIN	drawn by Y.Y. SOO	date 07.02.02	drawing no. AB/6116/XA101	scale 1:1500
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	office ARCHITECTURAL BRANCH			

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