

ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

HEAD 704 – DRAINAGE

Environmental Protection – Sewerage and sewage treatment

236DS – Tai Po sewage treatment works, stage 5 phase 2B

Members are invited to recommend to Finance Committee the upgrading of **236DS** to Category A at an estimated cost of \$659.0 million in money-of-the-day prices.

PROBLEM

The existing Tai Po sewage treatment works (TPSTW) is reaching its design capacity and will not be able to cope with the forecast sewage flow.

PROPOSAL

2. The Director of Drainage Services, with the support of the Secretary for the Environment, proposes to upgrade **236DS** to Category A at an estimated cost of \$659.0 million in money-of-the-day (MOD) prices for the extension works for TPSTW.

PROJECT SCOPE AND NATURE

3. The scope of **236DS** comprises –
- (a) construction of a primary sedimentation tank, three aeration tanks and two final clarifiers;
 - (b) modification of four existing final clarifiers;

/(c)

- (c) expansion and modification of existing inlet pumping facilities;
- (d) expansion of facilities for sludge treatment; and
- (e) ancillary works.

_____ A site plan showing the proposed works is at Enclosure 1.

4. We plan to commence construction in January 2010 for completion in September 2013.

JUSTIFICATION

5. The existing TPSTW serving Tai Po district is a secondary sewage treatment plant with a design capacity of 88 000 cubic metres per day (m³/day). In view of the population growth and sewerage network expansion in the Tai Po district leading to progressive increase in sewage flow, there is a need to proceed with the stage 5 extension of the TPSTW to increase its treatment capacity and to disinfect the treated effluent.

6. To match with the increase in sewage flow, the stage 5 extension was divided into phase 1, 2A and 2B. In May 2005 and May 2008, we started the construction of **222DS** “Tai Po sewage treatment works, stage 5 phase 1” and **342DS** “Tai Po sewage treatment works, stage 5 phase 2A – disinfection” respectively. Upon completion of these 2 phases in early 2010, the design capacity of TPSTW will be increased from 88 000 m³/day to 100 000 m³/day and ultra-violet disinfection will be provided.

7. We plan to start construction of the remaining works under phase 2B in January 2010 to increase the treatment capacity of TPSTW to 120 000 m³/day. Delay in commissioning will lead to deterioration of the effluent quality of TPSTW causing pollution of the Victoria Harbour.

FINANCIAL IMPLICATIONS

8. We estimate the project cost of the proposed works to be \$659.0 million in MOD prices (see paragraph 9 below), made up as follows –

/(a)

	\$ million	
(a) Construction of primary sedimentation tank, aeration tanks and final clarifiers	265.4	
(b) Modification of existing final clarifiers	78.2	
(c) Expansion and modification of existing inlet pumping facilities	16.8	
(d) Expansion of facilities for sludge treatment	165.6	
(e) Ancillary works	6.5	
(f) Environmental mitigation measures	7.9	
(g) Consultants' fees for environmental monitoring and audit	4.0	
(h) Contingencies	54.1	
Sub-total	598.5	(in September 2008 prices)
(i) Provision for price adjustment	60.5	
Total	659.0	(in MOD prices)

————— A detailed breakdown of the estimates for the consultants' fees by man-months is at Enclosure 2.

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

Year	\$ million (Sept 2008)	Price adjustment factor	\$ million (MOD)
2009 – 2010	0.1	1.03500	0.1
2010 – 2011	94.1	1.05570	99.3
2011 – 2012	151.2	1.07681	162.8
2012 – 2013	143.1	1.09835	157.2
2013 – 2014	101.0	1.12032	113.2
2014 – 2015	82.7	1.15113	95.2
2015 – 2016	25.7	1.18566	30.5
2016 – 2017	0.6	1.22123	0.7
	598.5		659.0

10. We have derived the MOD estimate on the basis of the Government's latest forecast of the trend rate of change in the prices of the public sector building and construction output for the period from 2009 to 2017. We will implement the works under two contracts: a civil engineering works contract and an electrical and mechanical (E&M) works contract. We will tender the civil engineering works on a re-measurement basis because of uncertainties in ground conditions. The civil engineering works contract will provide for price adjustment. We will tender the E&M works contract for the supply and installation of E&M equipment on a lump-sum basis.

11. We estimate the annual recurrent expenditure arising from the proposed works to be \$16.2 million.

PUBLIC CONSULTATION

12. On 12 November 2008, we consulted the Environment, Housing and Works Committee of the Tai Po District Council on the project and Members supported the proposed works. We also consulted the village representatives of Yue Kok, Fung Yuen and Ha Hang Villages located near the TPSTW and the Hong Kong Science and Technology Parks Corporation, the management agent of Tai Po Industrial Estate, in November 2008. They all had no objection to the proposed works.

13. We consulted the Legislative Council Panel on Environmental Affairs on 27 April 2009 on the proposed works. Members raised no objection to our plan to submit the funding proposal to the Public Works Subcommittee.

ENVIRONMENTAL IMPLICATIONS

14. The whole stage 5 works, of which **236DS** forms a part, is a designated project under the Environmental Impact Assessment (EIA) Ordinance. An environmental permit is required for its construction and operation. On 28 October 2004, the Director of Environmental Protection approved the EIA report of the stage 5 project. The EIA study concluded that with the implementation of mitigation measures, the project would not give rise to unacceptable environmental impacts. We obtained an Environmental Permit for the stage 5 phase 2 works, of which **236DS** forms a part, on 22 March 2007. We will implement the mitigation measures required in the Environmental Permit. The key measures include covering the exposed area of treatment facilities and installation of deodourizers to control odour.

15. For short-term impacts during construction, we will control noise, dust and site run-off to levels within the established standards and guidelines, through implementation of mitigation measures in the works contracts, such as the use of silenced construction plant to reduce noise generation, water-spraying to reduce emission of fugitive dust, and proper treatment of site run-off before discharge. We will also conduct environmental monitoring and audit to ascertain the effectiveness of the mitigation measures. We have included in paragraph 8(f) above a sum of \$7.9 million (in September 2008 prices) in the project estimate for the implementation of environmental mitigation measures.

16. We have considered in the planning and design stages ways to reduce the generation of construction waste where possible. Such ways include optimization of the sewerage design to minimize the extent of excavation and to avoid as far as

/practicable

practicable demolition of existing structures. In addition, we will require the contractor to reuse inert construction waste (e.g. excavated soil for backfilling) on site or in other suitable construction sites as far as possible, in order to minimize the disposal of inert construction waste to public fill reception facilities. We will encourage the contractor to maximize the use of recycled or recyclable inert construction waste, as well as the use of non-timber formwork to further minimize the generation of construction waste.

17. We will also require the contractor to submit for approval a plan setting out the waste management measures, which will include appropriate mitigation means to avoid, reduce, reuse and recycle inert construction waste. We will ensure that the day-to-day operations on site comply with the approved plan. We will require the contractor to separate the inert portion from non-inert construction waste on site for disposal at appropriate facilities. We will control the disposal of inert construction waste and non-inert construction waste to public fill reception facilities and landfills respectively through a trip-ticket system.

18. We estimate that the project will generate in total about 153 700 tonnes of construction waste. Of these, we will reuse about 5 000 tonnes (3%) of inert construction waste on site and deliver 147 000 tonnes (96%) of inert construction waste to public fill reception facilities¹ for subsequent reuse. In addition, we will dispose of 1 700 tonnes (1%) of non-inert construction waste at landfills. The total cost for accommodating construction waste at public fill reception facilities and landfill sites is estimated to be \$4.2 million for this project (based on a unit cost of \$27/tonne for disposal at public fill reception facilities and \$125/tonne² at landfills.)

HERITAGE IMPLICATIONS

19. The project will not affect any heritage site, i.e. all declared monuments, proposed monuments, graded historic sites/buildings, sites of archaeological interest and Government historic sites identified by the Antiquities and Monuments Office.

/LAND

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

² The 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/m³), nor the cost to provide new landfills (which is likely to be more expensive) when the existing ones are filled.

LAND ACQUISITION

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

BACKGROUND INFORMATION

21. The TPSTW is a secondary sewage treatment works located within the Tai Po Industrial Estate. It has been developed in five stages. Stage 1 was commissioned in 1979 and stage 2 in 1982. The combined design capacity of the two stages was 33 600 m³/day.

22. The next two stages of extension, commissioned in 1986 and 1995, provided an additional capacity of 54 400 m³/day, bringing the overall designed treatment capacity to 88 000 m³/day.

23. As mentioned in paragraph 6 above, we have been implementing the stage 5 extension works in phases. **222DS** “Tai Po sewage treatment works, stage 5 phase 1” and **342DS** “Tai Po sewage treatment works, stage 5 phase 2A – disinfection” are under construction and are scheduled for commissioning in early 2010. Upon completion, the design capacity will be increased from 88 000 m³/day to 100 000 m³/day providing in addition ultra-violet disinfection to the treated effluent.

24. We upgraded **236DS** to Category B in October 2006.

25. Of the 556 trees within the project boundary, 472 trees will be preserved. The proposed works will involve the removal of 84 trees, including 53 trees to be felled and 31 trees to be replanted within the project site. All trees to be removed are not important trees³.

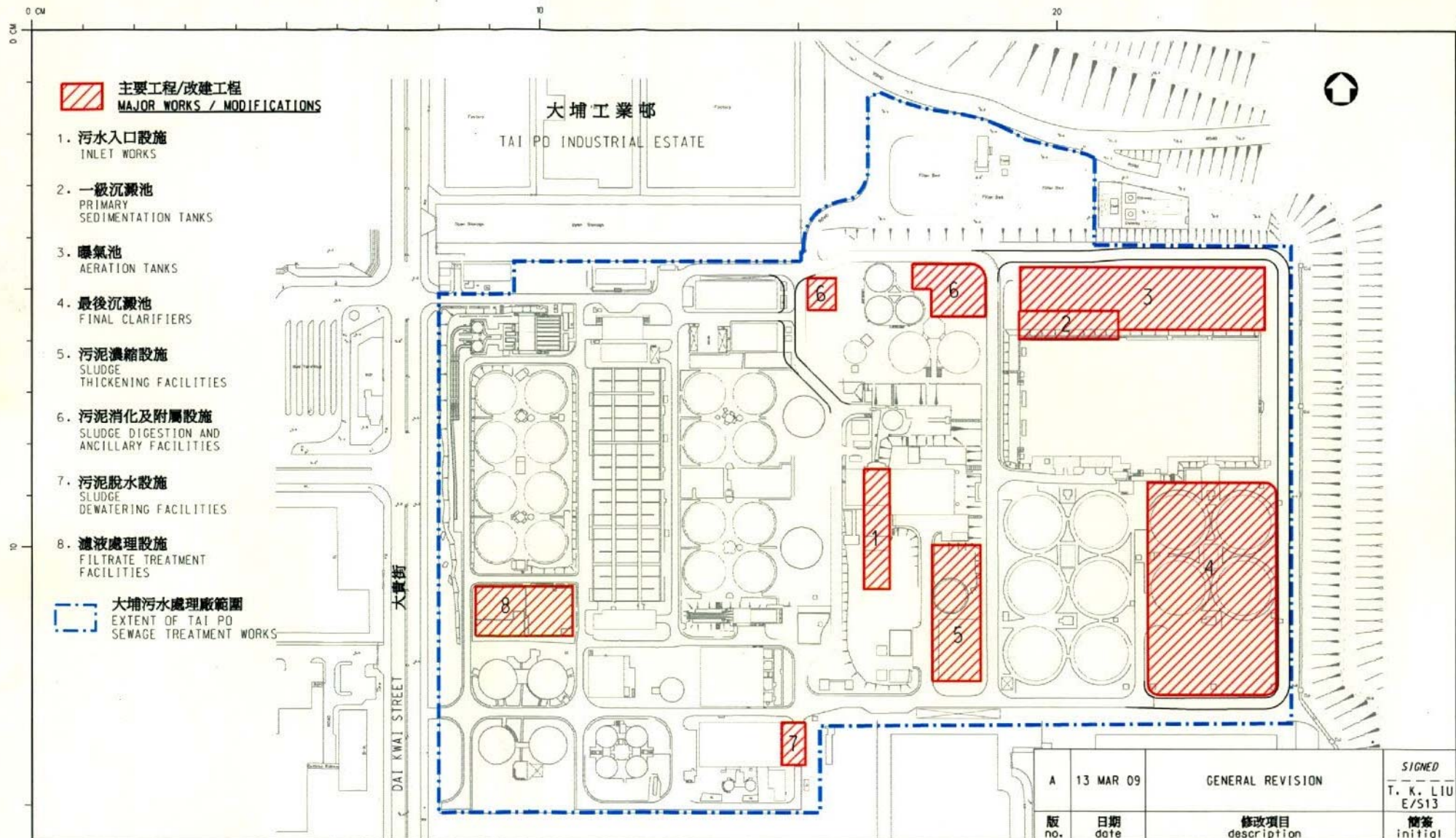
/26.

³ An “important tree” refers to trees in the Register of Old and Valuable Trees, or any other trees that meet one or more of the following criteria –

- (a) trees of 100 years old or above;
- (b) trees of cultural, historical or memorable significance e.g. Fung Shui tree, tree s landmark of monastery or heritage monument, and trees in memory of an important person or event;
- (c) trees of precious or rare species;
- (d) trees of outstanding form (taking account of overall tree sizes, shape and any special features) e.g. trees with curtain like aerial roots, trees growing in unusual habitat; or
- (e) trees with trunk diameter equal or exceeding 1.0 metre (measured as 1.3 m above ground level), or with height/canopy spread equal or exceeding 25 m.

26. We estimate that the proposed works will create about 198 jobs (170 for labourers and another 28 for professional/technical staff) providing a total employment of 7 800 man-months.

Environment Bureau
May 2009



主要工程/改建工程
MAJOR WORKS / MODIFICATIONS

1. 污水入口設施
INLET WORKS
2. 一級沉澱池
PRIMARY SEDIMENTATION TANKS
3. 曝氣池
AERATION TANKS
4. 最後沉澱池
FINAL CLARIFIERS
5. 污泥濃縮設施
SLUDGE THICKENING FACILITIES
6. 污泥消化及附屬設施
SLUDGE DIGESTION AND ANCILLARY FACILITIES
7. 污泥脫水設施
SLUDGE DEWATERING FACILITIES
8. 濾液處理設施
FILTRATE TREATMENT FACILITIES

大埔污水處理廠範圍
EXTENT OF TAI PO SEWAGE TREATMENT WORKS

大埔工業邨
TAI PO INDUSTRIAL ESTATE

大輦街
DAI KWAI STREET

圖則名稱 drawing title

工務工程計劃編號 236DS
大埔污水處理廠第5階段第2B期工程
PWP ITEM No. 236DS
TAI PO SEWAGE TREATMENT WORKS, STAGE 5 PHASE 2B

繪畫 drawn	SIGNED M. W. CHEUNG	日期 date	27 FEB 09
核對 checked	SIGNED Ir T. K. LIU	日期 date	27 FEB 09
批核 approved	SIGNED Ir S. K. IP	日期 date	27 FEB 09
部門 office	污水工程部 SEWERAGE PROJECTS DIVISION		

A	13 MAR 09	GENERAL REVISION	SIGNED T. K. LIU E/S13
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比例 scale
DIAGRAMMATIC

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DRAINAGE SERVICES DEPARTMENT
GOVERNMENT OF THE HONG KONG
SPECIAL ADMINISTRATIVE REGION

ENCLOSURE 1 附件一

Enclosure 2 to PWSC(2009-10)19

236DS – Tai Po sewage treatment works, stage 5 phase 2B

Breakdown of estimates for consultants' fees (in September 2008 prices)

		Estimated man- months	Average MPS* salary point	Multiplier (Note 1)	Estimated fee (\$ million)
Consultants' fees for environmental monitoring and audit ^(Note 2)	Professional	17	38	2.0	2.1
	Technical	48	14	2.0	1.9
Total					4.0

* MPS = Master Pay Scale

Notes

1. A multiplier of 2.0 is applied to the average MPS point to arrive at the full staff costs including the consultant's overheads and profit as the staff will be employed in the consultants' offices. MPS points 38 and 14 are used as the average MPS salary points for professionals and technical staff respectively. (As at 1 April 2008, MPS point 38 = \$60,535 per month and MPS point 14 = \$19,835 per month.)
2. We will only know the actual fees when we have selected the consultants through the usual competitive fee bid system.