

ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

HEAD 709 - WATERWORKS

Water Supplies - Fresh water supplies

252WF – Replacement of mechanical and electrical equipment in the Tsuen Wan raw water pumping station

Members are invited to recommend to Finance Committee the upgrading of **252WF** to Category A at an estimated cost of \$84.1 million in money-of-the-day prices for the replacement of the aged mechanical and electrical plant in the Tsuen Wan raw water pumping station.

PROBLEM

Most of the mechanical and electrical equipment in the Tsuen Wan raw water pumping station have been in service for about 44 years. Due largely to ageing, they are generally in very poor condition and beyond economic repair.

PROPOSAL

2. The Director of Water Supplies (DWS), with the support of the Secretary for Works, proposes to upgrade **252WF** to Category A at an estimated cost of \$84.1 million in money-of-the-day (MOD) prices for the replacement of the aged mechanical and electrical equipment in the Tsuen Wan raw water pumping station.

/PROJECT

PROJECT SCOPE AND NATURE

3. The scope of **252WF** comprises –
- (a) replacement of seven electric and three diesel pumpsets by eight electric pumpsets, and replacement of the associated pipework, surge protection equipment and lifting facilities;
 - (b) replacement of high voltage and low voltage power supply systems;
 - (c) replacement of control and monitoring equipment;
 - (d) decommissioning of four underground diesel fuel storage tanks (including environmental mitigation measures);
 - (e) asbestos abatement work for the pumping station building;
 - (f) civil modification works associated with items (a) to (e) above; and
 - (g) implementation of an environmental monitoring and audit programme for item (d) above.
4. We plan to start the proposed works in May 2002 for completion in December 2006. A site plan showing the location of the Tsuen Wan raw water pumping station is at the Enclosure.

JUSTIFICATION

5. The Tsuen Wan raw water pumping station came into service in 1958. It receives raw water from Tai Lam Chung reservoir and pumps it round the clock to the Tsuen Wan water treatment works for treatment into potable water and supply to the Kwai Chung and Lai Chi Kok areas. As the Tsuen Wan water treatment works receives most of its raw water supply from the Tsuen Wan raw water pumping station, any break down of the pumping station would seriously interrupt water supply to the Kwai Chung and Lai Chi Kok areas.

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6. The pumping station is equipped with seven electric pumpsets and three diesel pumpsets. The mechanical and electrical equipment including the pumpsets, power supply and control system in the pumping stations have been in service for many years ranging from 28 to 44 years. They are approaching the end of their serviceable life, and are currently in very poor condition. The deficiencies of the pumping station have led to high operating and maintenance costs. We have encountered difficulties in obtaining some of the necessary spare parts from the suppliers on some occasions and have to procure them through tailor-made orders. Operational efficiency and maintenance cost apart, the continued use of an aged power supply and control equipment can be potentially dangerous because the risk of power failure leading to fire and explosion would increase.

7. At present, we manually control and regulate the inflow and outflow of the pumping station in response to fluctuation in water demand. This mode of operation is slow in response and is out-of-date as compared to computerised remote control operation commonly used nowadays.

8. To ensure the reliability of the Tsuen Wan raw water pumping station and to enable implementation of remote control and monitoring of the pumping station from the Tsuen Wan water treatment works and the Mainland South West Regional Office, we propose to replace the aged mechanical and electrical equipment and the associated control and monitoring system in the pumping station as proposed in paragraph 3 above.

9. Replacement of the diesel pumpsets and decommissioning of their underground diesel fuel storage tanks will help improve the surrounding environment – the new pumpsets will generate lower operating noise, will not emit exhaust gas and will eliminate the potential risk of land contamination due to fuel leakage or spillage.

FINANCIAL IMPLICATIONS

10. We estimate the capital cost of the project to be \$84.1 million in MOD prices (see paragraph 11 below), made up as follows –

/(a)

| | | \$ million | |
|-----|---|-------------------|----------------------------|
| (a) | Replacement of seven electric and three diesel pumpsets by eight electric pumpsets, and replacement of the associated pipework, surge protection equipment and lifting facility | 29.6 | |
| (b) | Replacement of high voltage and low voltage power supply systems | 22.9 | |
| (c) | Replacement of control and monitoring equipment | 3.4 | |
| (d) | Decommissioning of four underground diesel fuel storage tanks (including \$0.6 million for environmental mitigation measures) | 1.7 | |
| (e) | Asbestos abatement work for the pumping station building | 3.8 | |
| (f) | Civil modification works associated with items (a) to (e) above | 13.6 | |
| (g) | Environmental monitoring and audit programme for item (d) above | 0.2 | |
| (h) | Contingencies | 7.5 | |
| | Sub-total | 82.7 | (in September 2001 prices) |
| (i) | Provision for price adjustment | 1.4 | |
| | Total | 84.1 | (in MOD prices) |

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

| Year | \$ million (Sept 2001) | Price adjustment factor | \$ million (MOD) |
|-------------|-----------------------------------|--|-----------------------------|
| 2002 - 2003 | 2.4 | 0.99700 | 2.4 |
| 2003 - 2004 | 10.4 | 1.00398 | 10.4 |
| 2004 - 2005 | 27.2 | 1.01101 | 27.5 |
| 2005 - 2006 | 6.2 | 1.01808 | 6.3 |
| 2006 - 2007 | 26.4 | 1.02521 | 27.1 |
| 2007 - 2008 | 10.1 | 1.03239 | 10.4 |
| | 82.7 | | 84.1 |

12. We have derived the MOD estimates on the basis of the Government's latest forecast of trend labour and construction prices for the period 2002 to 2008. We will tender the supply and installation of the mechanical and electrical equipment under a lump sum contract without provision for price adjustment. Since it is difficult to predetermine the precise timing and quantities of the civil works to be ordered, we will carry out these works under a term contract on a re-measurement basis to allow greater flexibility and better suit the progress of work on the congested site. The term contract will provide for price adjustments because the contract period will exceed 21 months.

13. The saving in recurrent expenditure arising from this project is about \$3.3 million per annum.

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14. This project by itself would lead to a decrease in water charges¹ by 0.02% in real terms by 2008.

PUBLIC CONSULTATION

15. We have consulted the Tsuen Wan District Council and attended its Environmental and Health Affairs Committee meeting on 10 January 2002. The Committee members showed no objection to the project.

ENVIRONMENTAL IMPLICATIONS

16. DWS completed a Preliminary Environmental Review (PER) of the project in March 2000. The Director of Environmental Protection (DEP) vetted the PER and agreed that the project contained both designated and non-designated elements classified under the Environmental Impact Assessment (EIA) Ordinance.

17. The replacement of the mechanical and electrical equipment is not classified as a designated project under the EIA Ordinance. Environmental study for this non-designated part of the project is not necessary. There will not be insurmountable impact arising from noise, dust and construction waste generated from the replacement works. During the works period, we will implement standard pollution control measures in relevant works contracts to ensure that potential environmental impacts are controlled to comply with the established standards and guidelines.

18. The decommissioning of four underground diesel fuel storage tanks is classified as a designated project under the EIA Ordinance in connection with "A store for oil with a storage capacity exceeding 200 tonnes" and an Environmental Permit is required for the decommissioning works. The Director of Environmental Protection approved the EIA Report and issued the environmental permit for the project under the EIA Ordinance in February 2002. The EIA report concluded that the project would not have long-term adverse environmental implications. The

/short-term

¹ The decrease in water charges is calculated on the assumption that the demand remains static during the period from 2001 to 2008 and the amount of government subsidy to the waterworks operations is to be contained at the present level.

short-term environmental impacts of the decommissioning works could be controlled to within established standards and guidelines with the implementation of appropriate mitigation measures. We will incorporate the recommended environmental mitigation measures into the contract specifications and implementation schedules to be implemented by the contractors. These measures include the use of silenced powered mechanical equipment, installation of temporary noise barriers, sequencing the separate use of powered mechanical equipment, restriction on the operating hours of construction plant, an environmental monitoring and audit programme, and implementation of specified procedures for handling any suspected petroleum contaminated soil if it is encountered. We have included the costs of implementing the environmental mitigation measures (\$0.6 million) and an environmental monitoring and audit programme (\$0.2 million) in the overall project estimate.

19. At the planning and design stages, we have given due consideration to the need to minimise the generation of construction and demolition (C&D) materials. We will reuse the excavated inert material generated from removal of the topsoil during decommissioning of the underground fuel storage tanks, to fill up the void after decommissioning with a view to minimising the generation of C&D materials. We estimate that about 3 250 m³ of C&D materials will be generated by the project. Of these, we will reuse about 1 150 m³ (35.4 %) on site, 2 000 m³ (61.5 %) as fill in public filling areas² and dispose of 100 m³ (3.1%) at landfills. The notional cost of accommodating C&D waste at landfill sites is estimated to be \$12,500 for this project (based on a notional unit cost³ of \$125/m³). We will require the contractor to implement necessary measures to minimise the generation of C&D materials and to reuse and recycle C&D materials as far as practicable. We will control the proper disposal of C&D materials at designated public filling facilities and/or landfills through a trip-ticket system. We will also record the reuse, recycling and disposal of C&D materials for monitoring purposes.

/LAND

² 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.

³ 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/m³), 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

20. Additional land will be required to accommodate the new equipment. District Lands Officer, Tsuen Wan would allocate an additional piece of Government land measuring 22 metres (m) x 7 m adjacent to the existing boundary of the pumping station for implementing this project.

21. The project does not require land acquisition.

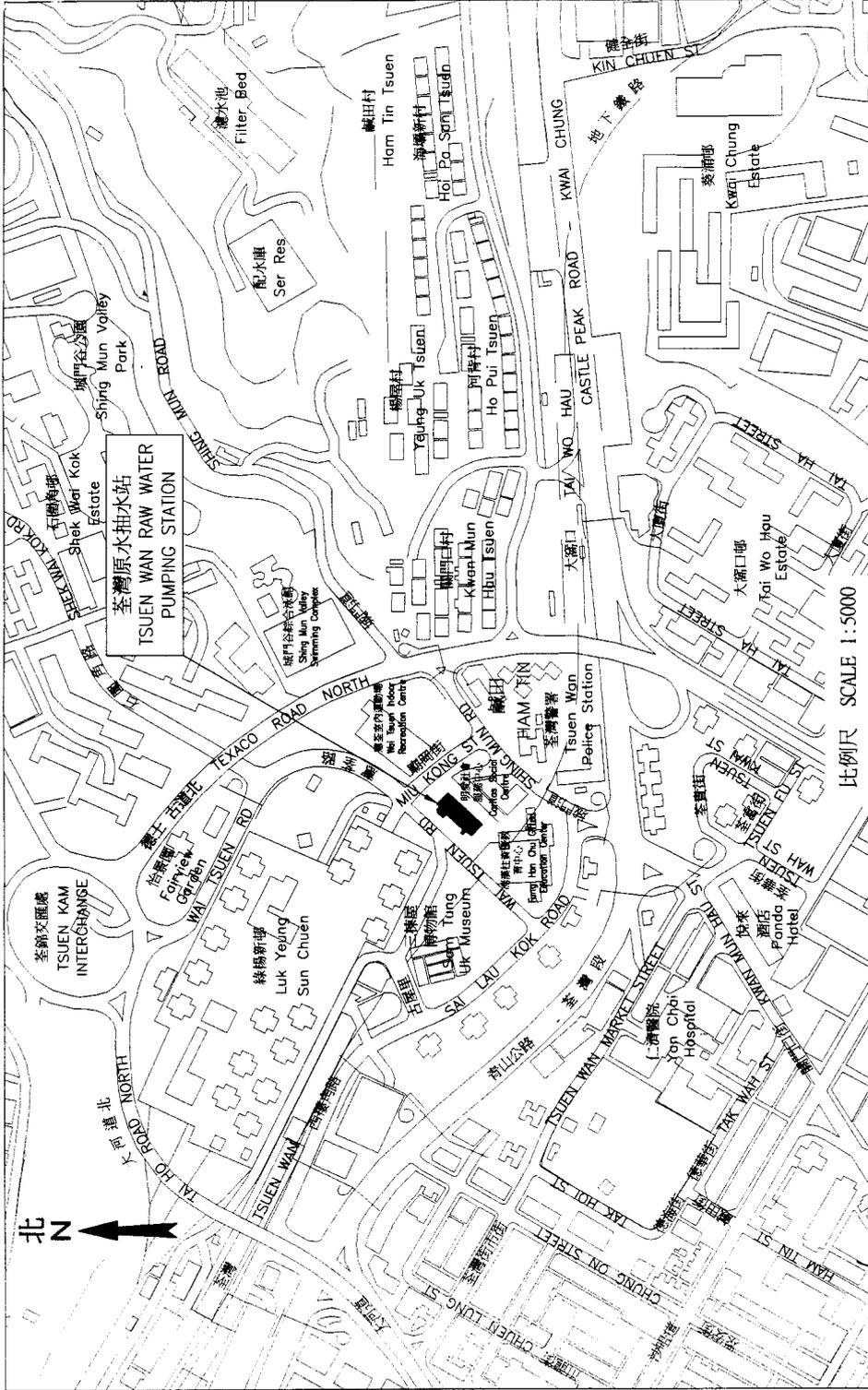
BACKGROUND INFORMATION

22. We upgraded **252WF** to Category B in September 2000.

23. We have substantially completed the detailed design work for **252WF** using in-house resources.

24. We estimate that the project will create some nine jobs comprising two professional/technical staff and seven labourers, totalling 454 man-months.

Works Bureau
February 2002



水務署
WATER SUPPLIES DEPT.
草圖編號
SKETCH NO. SK70058/105

工務計劃項目編號9252WF - 更換荃灣原水抽水站機電設備
P.W.P. NO. 9252WF - REPLACEMENT OF MECHANICAL AND ELECTRICAL EQUIPMENT
IN TSUEN WAN RAW WATER PUMPING STATION

比例尺 SCALE 1:5000

核准 APPROVED
總務處工程師/工務部 CEM/EP
19 / 2 / 2002
(甲級工程)
(CAT 'A' SUBMISSION)