

## ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

### Head 704 – DRAINAGE

#### Environmental Protection – Sewerage and sewage treatment

#### 143DS – Central, Western and Wan Chai West sewerage, stage 2 phase 2 works

Members are invited to recommend to Finance Committee –

- (a) the upgrading of part of **143DS**, entitled “Central, Western and Wan Chai West sewerage, stage 2 phase 2A works” to Category A, at an estimated cost of \$253.8 million in money-of-the-day prices; and
- (b) the retention of the remainder of **143DS**, retitled “Central, Western and Wan Chai West sewerage, stage 2 phase 2B works” in Category B.

### PROBLEM

Existing sewers in Central and Western District and Wan Chai West do not have adequate capacity to cope with the increasing sewage flow generated in these areas.

### PROPOSAL

2. The Director of Drainage Services, with the support of the Secretary for the Environment and Food, proposes to upgrade part of **143DS** to Category A at an estimated cost of \$253.8 million in money-of-the-day (MOD) prices for construction of Central and Western District and Wan Chai West sewerage, stage 2 phase 2A works.

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## PROJECT SCOPE AND NATURE

3. The comprehensive sewerage improvement scheme in Central and Western District and Wan Chai West is implemented in two stages as follows –

(a) Stage 1

- (i) Construction of about 5.9 kilometres (km) of trunk sewers along the coastal areas;
- (ii) construction of two pumping stations at the existing Central and Wan Chai East sewage screening plants; and
- (iii) upgrading and improvement of about 19.0 km of branch sewers on the hillside in the upper catchment, e.g., the Mid-levels.

(b) Stage 2 phase 1

Construction of about 5.4 km of sewers from 225 millimetres (mm) to 1 350 mm in diameter in Central and Western District and Wan Chai West.

(c) Stage 2 phase 2A

- (i) Construction of about 600 metres (m) of new sewers from 300 mm to 800 mm in diameter for connecting sewers at the upper catchment to the trunk system;
- (ii) upgrading and rehabilitation of about 6.9 km of old sewers from 225 mm to 1 200 mm in diameter with critical capacity and ageing problems;
- (iii) rectification of expedient connections<sup>1</sup> in old sewers; and
- (iv) decommissioning of Wan Chai West sewage screening plant.

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<sup>1</sup> Expedient connections are improper connections which divert foul sewage flows into stormwater drains and stormwater flows into foul sewers. Please see paragraph 15 for more information.

(d) Stage 2 phase 2B

Construction of about 7.5 km of branch sewers along the coastal areas in the lower catchment of Central and Western District.

4. Works under stage 1 and stage 2 phase 1 have started. We now propose to upgrade to Category A the stage 2 phase 2A works under **143DS**. We plan to start the proposed works in June 2002 for completion in September 2005. A location plan showing the proposed works is at Enclosure 1.

5. The remainder of **143DS** for retention in Category B is the stage 2 phase 2B works which comprise the sewerage works in Central and Western areas for connecting to Central sewage screening plant. We plan to start the stage 2 phase 2B works in 2004 for completion in 2006.

## JUSTIFICATION

6. The majority of sewers in Central and Western District and Wan Chai West were built 30 years ago and need replacement. We also need to upgrade some of the sewers in these districts to cope with the additional sewage flows from new developments. These include the housing development sites near Queen Street and Wan Chai Road (for completion by 2003), the Central Reclamation Phase 3 site (for completion by 2007), the residential development site near Lung Wah Street (for completion by 2007) and the Wan Chai Development Phase 2 site (for completion by 2009). The total residential and non-residential population arising from these developments are estimated to be 27 000 and 60 000 respectively. The existing dense development in these areas, coupled with heavily used and narrow roads, preclude construction of all new sewerage systems at the same time. Phased construction is needed to avoid creating severe disruption to residents and traffic.

7. With progressive completion of the stage 1 works, we will have to proceed with the stage 2 works to meet future demands arising from existing and planned developments in the districts. To minimise possible disruption to traffic, we have divided implementation of stage 2 works into several phases. We already started stage 2 phase 1 works in October 2001 for completion in March 2005. We have recently worked out the traffic arrangement for the proposed sewerage works under stage 2 phase 2A and are now ready to commence construction.

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8. The existing Wan Chai West sewage screening plant does not have sufficient site areas for upgrading to cope with the increasing sewage flows generated by new developments in the district. Its present location at the waterfront of Wan Chai is also no longer compatible with the surrounding environment. To provide adequate capacity to cope with the increasing sewage flow generated in Central and Western District and Wan Chai West, we will divert the sewage flow to the upgraded Wan Chai East sewage screening plant. Following the commissioning of the upgraded Wan Chai East sewage screening plant under stage 1 in June 2002 and completion of the construction of the associated sewers in mid 2003 as part of the stage 2 phase 2A works, we will decommission the Wan Chai West sewage screening plant.

## FINANCIAL IMPLICATIONS

9. We estimate the capital cost of the proposed stage 2 phase 2A works to be \$253.8 million in MOD prices (see paragraph 10 below), made up as follows –

	<b>\$million</b>
(a) Construction of about 7.5 km of sewers	192.5
(i) by trenchless method <sup>2</sup> (about 0.25 km)	37.8
(ii) by open cut method (about 7.25 km)	154.7
(b) Decommissioning of Wan Chai West sewage screening plant	3.4
(c) Consultants' fees for	35.4
(i) contract administration	1.3
(ii) site supervision	34.1

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<sup>2</sup> Trenchless method refers to the use of micro-tunnelling or boring techniques to construct underground sewers and drain pipes underneath or across the existing drainage channels or box culverts. Although the trenchless method is about four times more expensive than the conventional open cut method, the former method, if feasible, is preferred as it would not affect the capacity of the existing drainage channels or box culverts.

	<b>\$million</b>	
(d) Environmental mitigation measures	1.6	
(e) Contingencies	25.1	
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Sub-total	258.0	(in September 2001 prices)
(f) Provision for price adjustment	(4.2)	
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Total	253.8	(in MOD prices)
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— A breakdown of the estimates for the consultants' fees by man-months is at Enclosure 2.

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

Year	\$ million (Sept 2001)	Price adjustment factor	\$ million (MOD)
2002 – 2003	27.3	0.98625	26.9
2003 – 2004	68.0	0.98378	66.9
2004 – 2005	59.4	0.98378	58.4
2005 – 2006	57.3	0.98378	56.4
2006 – 2007	30.3	0.98378	29.8
2007 – 2008	15.7	0.98378	15.4
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	258.0		253.8

11. We have derived the MOD estimate on the basis of Government's latest forecast of trend labour and construction prices for the period 2002 to 2008. We will tender the works under a standard re-measurement contract because of the uncertainties of the existence and location of underground utilities such as electricity cables, telephone cables and water pipes. The contract will provide for price adjustments because the contract period will exceed 21 months.

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12. The proposed works will not give rise to additional recurrent expenditure.

## **PUBLIC CONSULTATION**

13. We consulted the then Central and Western District Board, and Wan Chai District Board on **143DS** (both stage 1 and stage 2 works) in May 1993 and August 1993 respectively. The then Central and Western District Board requested to carry out the project immediately while the then Wan Chai District Board had no objection to the proposed works. We consulted the Central and Western District Council and the Wan Chai District Council on the stage 2 works of **143DS** again on 16 November 2000 and 28 November 2000 respectively. Both Councils had no objection to the implementation of the proposed works.

14. We consulted the Legislative Council Panel on Environmental Affairs on the proposed works on 26 November 2001. Some Members asked for further information on the background and the consequence of expedient connections, and measures to avoid such problems. These are set out in paragraphs 15 to 16.

15. Expedient connections are improper connections which divert foul sewage flows into stormwater drains and stormwater flows into foul sewers. Expedient connections include inappropriate connections between government-maintained public sewers and public storm drains on government land, improper connection within private premises and improper connections from private premises to public storm drains. There could be many reasons which led to expedient connections in the past. For instance, expedient connections could be used to address immediate flooding or overflow problems in some old districts at times when the capacity of the drainage/sewerage system was insufficient. There were also cases of expedient connections made by private sector for the purposes of cost saving and convenience. With such expedient connections, foul sewage can flow into the stormwater drainage system causing pollution to the receiving waters. Stormwater may also enter the sewerage system through these connections and reduce the capacity of the sewage collection and treatment system. In order to tackle these problems, Drainage Services Department will rectify any improper connection of public sewers and drains whenever such connections are detected in the course of undertaking sewerage works. The Environmental Protection Department is also working with the Buildings Department to deal with the improper connections within private lots or premises under the Coordinated Maintenance of Buildings Scheme. Under this Scheme, meetings will be arranged

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for owners' corporations to meet with representatives of concerned departments to help rectify the expedient connection problems in the concerned buildings. In addition to remedial actions, the Government will continue to improve our sewerage and drainage infrastructure to prevent recurrence of the problem.

16. At the Panel meeting, some Members also asked the Government to provide information on how the proposed construction sewerage works would be implemented in Central and the hours of construction works to be carried out each day in different areas of Central. To ensure that each section of road opening could be completed promptly, we have devised and will incorporate into the contract document a works programme for each section of works with reference to site locality, land use nearby, traffic condition and working hours allowed. At busy areas in Central and Wan Chai, we would carry out works section by section with road opening in each section less than 50 m in order to alleviate nuisance and impact to the areas. We will not start any new section until completion of the previous one. We have specially planned the construction works according to individual local conditions, such as working from 10:00 a.m. to 4:00 p.m. only at certain busy roads to avoid peak hours traffic; working from 9:00 p.m. to 11:00 p.m. at extremely busy road sections such as Chater Road to avoid causing serious traffic impact. The section at work will be temporarily covered and the roads fully opened for traffic outside these hours.

17. In response to some Members' suggestion, we will carry out overnight works in commercial areas, such as road sections of Des Voeux Road, Chater Road, Murray Road, Harcourt Road and Ice House Street, to expedite works progress without inducing unacceptable nuisance to the public. By implementing overnight works, we estimate that the works at Central commercial areas can be shortened from 16 months to 13 months. We consulted the Food, Environment, Hygiene and Works Committee (FEHWC) of the Central and Western District Council on 21 March 2002 on the proposed overnight works. FEHWC had no objection to our proposal.

## **ENVIRONMENTAL IMPLICATIONS**

18. We completed an Environmental Impact Assessment (EIA) study in May 1996, which concluded that there would be no long-term environmental impacts exceeding established criteria. For short-term impact during the construction, we will control noise, dust and site run-off within established standards and guidelines through the implementation of mitigation measures, such as the use of temporary noise barriers and silenced construction plants to reduce

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noise generation, water-spraying to reduce emission of fugitive dust and strict control on diversion of sewage flows in the works contracts. An environmental monitoring and audit programme would be implemented to ensure compliance with EIA recommendations. For night-works identified as necessary at the Central commercial areas, we will apply for Construction Noise Permits under the Noise Control Ordinance and will restrict the plant type used to minimise the noise level. We will not schedule noisy operations after 11:00 p.m.

19. We estimate the cost of implementing the environmental mitigation measures to be \$1.6 million in September 2001 prices. We have included this in the overall project estimate.

20. We have considered in the planning and design stages ways of reducing the generation of construction and demolition (C&D) materials when designing the level and layout of the proposed works. We will require the contractor under the contract to submit a waste management plan to the Engineer for approval, with appropriate mitigate measures, including the allocation of an area for waste segregation. We will ensure that the day-to-day operations on site comply with the waste management plan. We will require the contractor to re-use the excavated material as filling material on site or on other construction sites as far as possible to minimize the disposal of public fill to public filling facilities. To further minimise the generation of C&D materials, we will encourage the contractor to use non-timber formwork and recyclable material for temporary works. We will control disposal of public fill and C&D waste to designated public filling facility 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 and reuse of C&D materials for monitoring purpose. We estimate that about 150 000 cubic metres (m<sup>3</sup>) of C&D materials will be generated by the project. Of these, we will use about 120 000 m<sup>3</sup> (80%) on site, 25 000 m<sup>3</sup> (17%) as fill in public filling areas<sup>2</sup> and dispose of 5 000 m<sup>3</sup> (3%) at landfills. The notional cost of accommodating C&D waste at landfill sites is estimated to be \$625,000 for this project (based on a notional unit cost<sup>3</sup> of \$125/m<sup>3</sup>).

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<sup>2</sup> A public filling area is a designated part of a development project that accepts public fill for reclamation purpose. Disposal of public fill in a public filling area requires a licence issued by the Director of Civil Engineering.

<sup>3</sup> This estimate has taken into account the cost for developing, operation and resorting 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<sup>3</sup>), nor the cost to provide new landfills (which are likely to be more expensive) when existing ones are filled. The notional cost estimate is for reference only and does not form part of this project estimate.



## LAND ACQUISITION

21. The proposed works do not require land acquisition.

## BACKGROUND INFORMATION

22. In August 1993, we completed a comprehensive study of the sewerage systems in Central, Western and Wan Chai West under **111DS** “Central, Western and Wan Chai West sewerage master plan study – consultants’ fees and investigation”.

23. In March 1994, we upgraded **143DS** to Category B to implement the sewerage works recommended under the study. In April 1994, we upgraded part of **143DS** to Category A as **176DS** “Central, Western and Wan Chai West sewerage, consultants’ fees and investigations” for engaging consultants to carry out detailed design, investigation, environmental and traffic impact assessments for the whole project.

24. In July 1996, we upgraded another part of **143DS** to Category A as **282DS** “Central, Western and Wan Chai West sewerage, stage 1 works” to construct the trunk sewers, two new sewage pumping stations and the critical sewers in the upper catchment of Central and Western District and Wan Chai West.

25. In April 2001, we further upgraded part of **143DS** to Category A as **327DS** “Central, Western and Wan Chai West sewerage, stage 2 phase 1 works” to construct the branch sewers in the lower catchment of Central and Western District and Wan Chai West.

26. We started the stage 1 works under **282DS** “Central, Western and Wan Chai West sewerage, stage 1 works” in September 1996. As at April 2002, we have completed construction works relating to trunk sewers and Wan Chai East sewage screening plant. We have also completed the upgrading and improvement works of the branch sewers. Construction works for the Central sewage screening plant are in progress and will be completed in end 2004.

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27. We estimate that the project will create some 105 jobs comprising 25 professional/technical staff and 80 labourers, totalling 4 400 man-months.

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Environment and Food Bureau  
May 2002

(pWSC143dsfin.doc)

## Enclosure 2 to PWSC(2002-03)28

## 143DS – Central, Western and Wan Chai West sewerage, stage 2 phase 2 works

## Breakdown of estimates for consultants' fees

Consultants' staff cost			Estimated man- month	Average MPS* salary point	Multiplier <sup>(Note 1)</sup>	Estimated fee (\$million)
(a)	Contract administration <sup>(Note 2)</sup>	Professional	7	–	–	1.0
		Technical	6	–	–	0.3
(b)	Site supervision by resident site staff of the consultants <sup>(Note 3)</sup>	Professional	135	38	1.7	13.9
		Technical	610	14	1.7	20.2
						35.4

\*MPS = Master Pay Scale

## Notes

1. A multiplier of 1.7 is applied to the average MPS point to estimate the cost of resident site staff supplied by the consultants. (As at 1.4.2001, MPS pt. 38 = \$60,395 per month and MPS pt. 14 = \$19,510 per month.)
2. The consultants' staff cost for contract administration is calculated in accordance with the consultancy agreement between the Director of Drainage Services and the consultants for the design and construction of the project **143DS**.
3. The consultants' staff cost for site supervision is based on estimates prepared by the Director of Drainage Services. We will know the actual man-months and actual costs only after the completion of the construction works.