

## **ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE**

### **Head 704 - DRAINAGE**

#### **Environmental Protection - Sewerage and sewage treatment**

#### **204DS - Wan Chai East and North Point sewerage, stage 2 works**

Members are invited to recommend to Finance Committee -

- (a) the upgrading of part of **204DS**, entitled “Wan Chai East and North Point sewerage, stage 2 works”, to Category A at an estimated cost of \$1,473.7 million in money-of-the-day prices; and
- (b) the retention of the remainder of 204DS, retitled “Wan Chai East and North Point sewerage, remaining works” in Category B.

### **PROBLEM**

The existing sewerage networks in Wan Chai East and North Point do not have adequate capacity to serve future developments in the areas.

### **PROPOSAL**

2. The Director of Drainage Services, with the support of the Secretary for the Environment and Food, proposes to upgrade part of 204DS to Category A at

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an estimated cost of \$1,473.7 million in money-of-the-day (MOD) prices for the construction of Wan Chai East and North Point sewerage, stage 2 works.

### **PROJECT SCOPE AND NATURE**

3. The part of 204DS which we now propose to upgrade to Category A comprises -

- (a) construction of approximately 3.1 kilometres of trunk sewers (with diameters ranging from 900 to 1 800 mm) along Causeway Road, Electric Road and Java Road in North Point; and
- (b) re-construction of the inlet pumping station in the existing North Point sewage screening plant (NPSSP) and the construction of associated ancillary works.

A map showing the location of the proposed works is at Enclosure 1.

4. The remainder of 204DS for retention in Category B comprises the following -

- (a) construction of approximately 3.2 kilometres of branch sewers in North Point;
- (b) rehabilitation of approximately 1.9 kilometres of existing sewers in North Point; and
- (c) rectification of expedient connections in Wan Chai East and North Point.

### **JUSTIFICATION**

5. The majority of the sewers in North Point were constructed more than 30 years ago. Although there have been local improvements to cater for developments in the district from time to time, the existing sewerage system does not have sufficient capacity to cater for future sewage flows generated from new developments, such as those at the Mount Butler Quarry site (by 2009), and the Oil Street Government Supplies Department site (by 2005). At present, some critical sections of the existing sewers, such as the trunk sewers along Electric Road and Java Road leading to the NPSSP, have nearly reached their maximum capacity

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with sewage backing up during the peak flow hours. In the short term, the problem can be kept under control by undertaking an intensive desilting programme to make sure that the existing sewerage system functions at its maximum capacity to avoid any overflow. However, if we do not carry out the upgrading works, sections of the existing sewerage system in North Point district will begin to overflow by about 2006.

6. We propose to increase the capacity of the sewerage system by constructing new trunk sewers of larger diameter so that the system will have sufficient capacity to meet future demands up to the year 2021. We will construct trunk sewers at steeper gradients and at deeper levels to avoid existing utilities and to provide adequate depths for future branch sewer connections. We also propose to reconstruct the inlet pumping station in conjunction with the proposed trunk sewers to provide additional pumping capacity to cater for the deeper levels of the new sewers and to meet the growing sewage flow demands. We intend to start construction works in January 2001 for completion in January 2006.

7. We will construct new branch sewers and rehabilitate existing branch sewers which have structural and capacity problems under the remainder of **204DS** in mid 2003 for completion in late 2006. Completion of all sewerage upgrading works will resolve the sewerage capacity problem within the area and provide a sustainable system to meet future demands.

8. We have obtained the agreement of the Commissioner for Transport and the Commissioner of Police for implementing temporary traffic schemes during the construction of the trunk sewers. As the proposed trunk sewers will run along Electric Road and Java Road, we propose to use the trenchless method of construction for the trunk sewers. This involves the use of pipe-jacking or boring techniques to construct underground sewers and drain pipes as opposed to digging open trenches in the roads. The trenchless method will be more expensive than the open-cut method but will greatly reduce the need for road opening and thus minimize disruption to traffic and underground utilities during the construction phase.

## **FINANCIAL IMPLICATIONS**

9. We estimate the capital cost of the proposed works to be \$1,473.7 million in MOD prices (see paragraph 10 below) made up as follows-

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	<b>\$million</b>	
(a) Trunk sewers (about 3.1 kilometres)	729.0	
(b) Pumping Station at North Point sewage screening plant	207.3	
(i) Civil works	99.2	
(ii) Electrical & mechanical works	108.1	
(c) Consultants' fees for -	121.3	
(i) construction stage	2.3	
(ii) resident site staff cost	119.0	
(d) Environmental mitigation measures	23.2	
(e) Contingencies	102.8	
Sub-total	1,183.6	(at December 1999 prices)
(f) Provision for price adjustment	290.1	
Total	1,473.7	(in MOD prices)

The cost breakdowns by man months of the estimate for the consultants' fees is at Enclosure 2.

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

<b>Year</b>	<b>\$ million (Dec 1998)</b>	<b>Price adjustment factor</b>	<b>\$ million (MOD)</b>
2000 – 2001	1.9	1.00000	1.9

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Year	\$ million (Dec 1998)	Price adjustment factor	\$ million (MOD)
2001 – 2002	148.1	1.04500	154.8
2002 – 2003	173.0	1.10770	191.6
2003 – 2004	179.8	1.17416	211.1
2004 – 2005	184.5	1.24461	229.6
2005 – 2006	219.9	1.31929	290.1
2006 – 2007	179.3	1.39845	250.7
2007 – 2008	97.1	1.48235	143.9
	1,183.6		1,473.7

11. We derived the MOD estimate on the basis of Government's latest forecasts of trend labour and construction prices for the period 2000 to 2008. Since the construction works involved are large scale and complex in nature, we will implement the project under three contracts. We will implement the trunk sewer works under two contracts. The first contract, which will include all non-trenchless works, will be a re-measurement contract with a contract period of less than 21 months with no provision for price adjustments. The second contract will involve the construction of the trunk sewers by the trenchless method. Concurrent with the second contract, we will construct the inlet pumping station at the NPSSP under a third contract. Both the second and third contracts will be lump-sum contracts because we are able to ascertain the scope of the majority of the project works before we start construction. As the contract period of these contracts will exceed 21 months, we will allow provision for adjustments to the tender price.

12. Less maintenance work will be required on the future sewerage network. Thus, despite an increase in the length of sewers to be maintained upon the completion of the project, we estimate that there will be a net reduction in the annual recurrent expenditure arising from the proposed sewerage works of \$0.2 million.

13. Based on the current expenditure on operation and maintenance of sewerage facilities, the proposed works by themselves will lead to a 0.03% decrease in the recurrent expenditure of provision of sewage services. This will be taken into account in determining sewage charges.

## **PUBLIC CONSULTATION**

14. We consulted the Eastern District Board in September 1996 on the proposed works in North Point, including the temporary traffic arrangements and environmental mitigation measures during construction. The former Eastern District Board supported the implementation of the proposed works. The scope of the project has remained unchanged since the consultation and we will report on the works programme, temporary traffic management schemes and environmental issues to the Eastern District Council prior to the commencement of the works contracts and during construction.

15. We consulted the Legislative Council Panel on Environmental Affairs on the proposed works on 7 April 2000. Members supported early implementation of the project.

## **ENVIRONMENTAL IMPLICATIONS**

16. We completed an Environmental Impact Assessment (EIA) study in September 1996, which concluded that, with the implementation of odour control units in the inlet pumping station, the environmental impacts arising from the project could be mitigated to within established criteria. The Advisory Council on the Environment endorsed the EIA in October 1996 without conditions. For short term impacts during the construction phase, we will control noise, dust and site run-off nuisance to comply with the established standards and guidelines through the implementation of appropriate mitigation measures, such as the use of noise barriers and silenced construction plant to reduce noise generation, water-spraying to reduce emission of fugitive dust and strict control on diversion of sewage flows in the works contracts. We estimate that the cost of implementing the environmental mitigation measures will be \$23.2 million in December 1999 prices. We have included this cost in the overall project estimate.

17. The proposed inlet pumping station is a designated project under Schedule 2 of the Environmental Impact Assessment Ordinance requiring an environmental permit for its construction and operation. The EIA, completed in 1996, assessed the environmental impacts from the inlet pumping station for a

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projected sewage flow in 2011. The Director of Environmental Protection carried out an Environmental Review in February 1999 for a revised design flow planned for 2021 and concluded that the EIA findings remain applicable.

18. We considered in the planning and design stages ways to minimize the generation of construction and demolition material (C&DM). We shall reuse the public fill generated from the project either on site or in other construction sites as far as possible. We estimate that about 36 000 cubic metres (m<sup>3</sup>) of public fill will be delivered to public filling areas after allowing for reuse and about 1 000m<sup>3</sup> of construction and demolition waste will be disposed of at landfills. We shall also require the contractor to implement necessary measures to minimize the generation of C&DM and to reuse and recycle C&DM. We shall control the disposal of C&DM through a trip-ticket system. We shall record the disposal, reuse and recycling of C&DM for monitoring purposes.

#### **LAND ACQUISITION**

19. The project does not require land acquisition.

#### **BACKGROUND INFORMATION**

20. We completed the Wan Chai East and North Point sewerage master plan study under 141DS “Wan Chai East and North Point sewerage master plan study - consultants’ fees and investigations” in August 1994. The study identified improvement works for the proper collection of sewage to treatment facilities in the areas.

21. We upgraded 204DS to Category B in October 1994. In June 1995, we upgraded part of 204DS to Category A as 195DS “Wan Chai East and North Point sewerage – consultants’ fees and investigations” for employing consultants to carry out detailed design, investigation, environmental and traffic impact assessments for the whole project.

22. In April 1997, we upgraded part of 204DS to Category A as 212DS “Wan Chai East and North Point sewerage – stage 1 works” to construct trunk sewers and branch sewers in Wan Chai East. The construction works commenced in April 1998 for completion in July 2004.

23. We completed the design and tender documents for the stage 2 works in January 2000. We intend to start the stage 2 works in January 2001 for completion in January 2006 under three contracts. We require a relatively long construction period because of the complexity of the works.

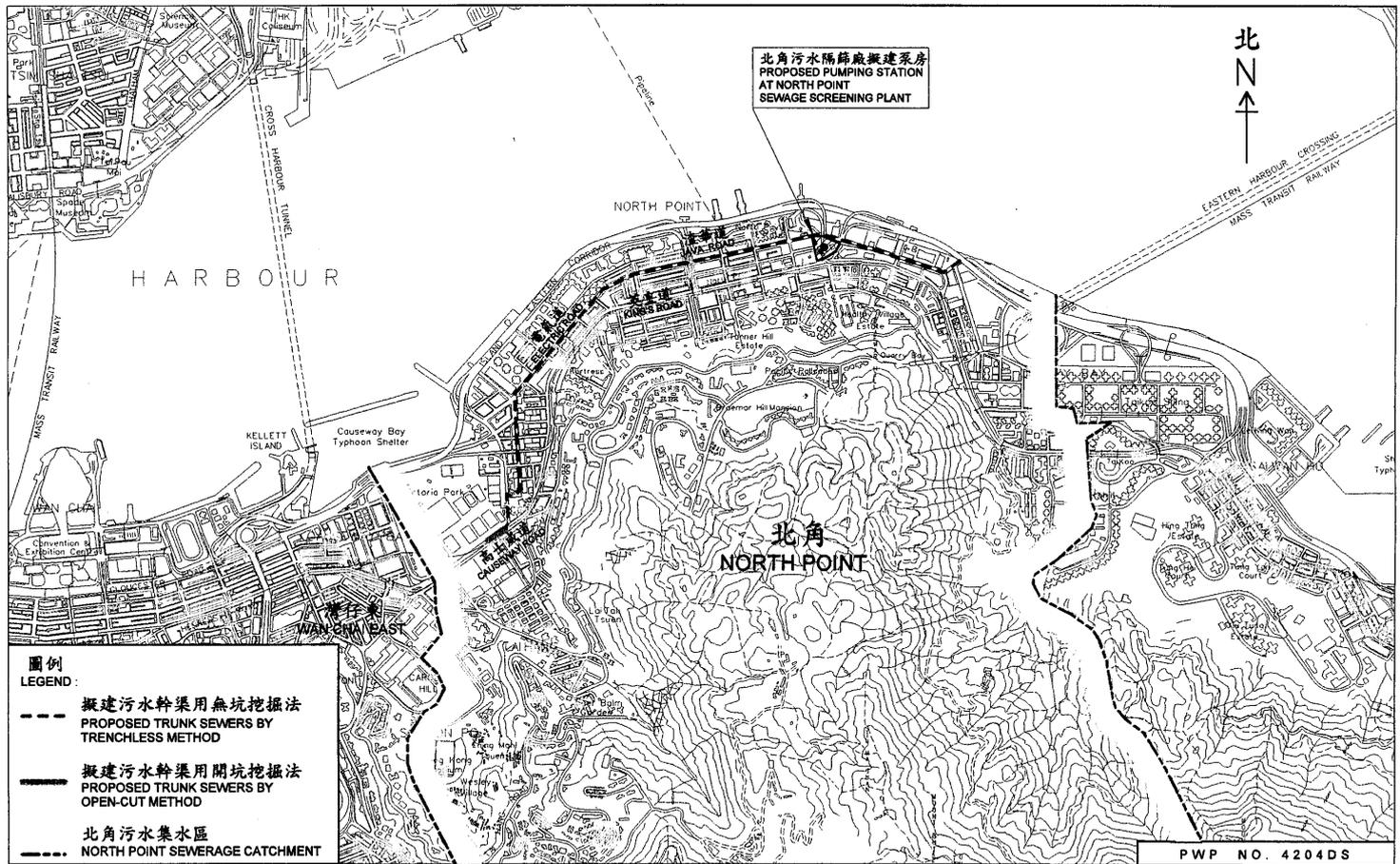
24. We plan to construct new branch sewers and rehabilitate existing branch sewers which have structural and capacity problems under the remainder of 204DS in mid 2003 for completion in late 2006 to tie in with the commissioning of the proposed trunk sewers and the reconstructed inlet pumping station.

25. We estimate that the proposed stage 2 works will create some 450 new jobs during the construction stage. These will comprise 120 professional or technical staff and 330 labourers, totalling 16 500 man months.

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Environment and Food Bureau  
May 2000

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北角污水隔廠擬建泵房  
PROPOSED PUMPING STATION  
AT NORTH POINT  
SEWAGE SCREENING PLANT

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**圖例**  
LEGEND

--- 擬建污水幹渠用無坑挖掘法  
PROPOSED TRUNK SEWERS BY  
TRENCHLESS METHOD

—— 擬建污水幹渠用開坑挖掘法  
PROPOSED TRUNK SEWERS BY  
OPEN-CUT METHOD

----- 北角污水集水區  
NORTH POINT SEWERAGE CATCHMENT

灣仔東及北角污水收集系統 - 第二期工程  
WAN CHAI EAST AND NORTH POINT SEWERAGE - STAGE 2 WORKS

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<p>香港特別行政區政府渠務署 DRAINAGE SERVICES DEPARTMENT GOVERNMENT OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION</p>	

ENCLOSURE 1  
附件一

## 204DS - Wan Chai East and North Point sewerage, stage 2 works

## Breakdown of estimates for consultants' fee

Consultants' staff costs			Estimated man months	Average MPS salary point	Multiplier factor	Estimated fee (\$ million)
(a)	Consultants' fees for construction stage	Professional	10	40	2.4	1.5
		Technical	16	16	2.4	0.8
(b)	Site supervision by resident site staff employed by the consultants	Professional	516	40	1.7	55.1
		Technical	1790	16	1.7	63.9
<b>Total consultants' staff costs</b>						<b>121.3</b>

## Notes

- As the consultants will work in their own offices, a multiplier of 2.4 is applied to the average MPS point to include the consultants' overheads and profit. A multiplier factor of 1.7 is applied in the case of site staff supplied by the consultants. (At 1.4.1999, MPS pt. 40 = \$62,780 p.m. and MPS pt. 16 = \$21,010 p.m.)
- The estimated consultants' fees for construction stage are based on the lump sum fees calculated in accordance with the consultancy agreement which the Director of Drainage Services has agreed with the consultants undertaking the design and construction of the project. The costs of resident site staff are based on estimates prepared by the Director of Drainage Services. We will only know the actual man months and costs after the completion of the construction works.