

ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

HEAD 704 - DRAINAGE

Public Safety - Landslip prevention

62BL - Investigation of sewers and drains affecting the safety of slope features in the new Government Catalogue of Slopes, phase 2

Members are invited to recommend to Finance Committee the upgrading of **62BL** to Category A at an estimated cost of \$143.3 million in money-of-the-day prices.

PROBLEM

Leakage from sewers and drains buried behind slopes may affect the stability of the slopes and pose hazards to life and property. We do not have sufficient information about the condition of the public sewers and drains that are maintained by Drainage Services Department (DSD sewers and drains) and are buried behind cut slopes, fill slopes and retaining walls (collectively named slope features).

PROPOSAL

2. The Director of Drainage Services (DDS), with the support of the Secretary for Works, proposes to upgrade **62BL** to Category A at an estimated cost of \$143.3 million in money-of-the-day (MOD) prices to engage consultants to carry out the phase 2 investigation of the DSD sewers and drains that may affect the safety of slope features registered in the Government Catalogue of Slopes and Retaining Walls¹ (New Catalogue).

/PROJECT

PROJECT SCOPE AND NATURE

3. The scope of the phase 2 investigation comprises the following tasks -
- (a) to ascertain the survey boundaries of all DSD sewers and drains that are buried behind and adjacent to slope features registered in the New Catalogue (save for those already in the previous 1977-78 Catalogue) and that would affect roads and open-space including playgrounds, car parks and country parks;
 - (b) to undertake surveys and prepare reports on the physical condition of the identified DSD sewers and drains;
 - (c) to recommend cost-effective remedial measures where necessary for the surveyed sewers and drains together with an implementation programme; and
 - (d) to review and update DSD's computerised asset inventory system containing the database of the sewers and drains together with the records of the pipe survey results and remedial measures.

We plan to start the proposed investigation study in October 2001 for completion in October 2005.

JUSTIFICATION

4. Sewers and drains are susceptible to leakage. Such leakage is mainly due to deterioration of the sewers and drains following prolonged years of service or the opening of pipe joints as a result of ground movement. Leakage from sewers and drains buried behind slope features may affect slope stability and pose hazards to life and property.

5. In order to prevent leakage of DSD sewers and drains that may affect slope stability, we have formulated a comprehensive investigation programme to check the condition of these sewers and drains, followed by the necessary repair works. We accorded priority to those slope features with higher risks and more severe consequences of failure.

6. In August 1996, we started investigating the DSD sewers and drains that may affect the slope features registered in the 1977-78 Catalogue, which covered about 10 000 slope features. We completed the investigation in April 2001 and have been carrying out the essential repair works which will be substantially completed before the wet season of 2001.

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7. At the end of 1998, the Geotechnical Engineering Office completed a comprehensive survey of all slope features in the territory and issued a New Catalogue. The New Catalogue covers about 54 000 slope features, including those already in the 1977-78 Catalogue. In October 1999, DSD engaged consultants to carry out a desktop study to identify the extent of DSD sewers and drains near the additional 44 000 newly-registered slope features. The initial findings of the study indicated that there would be about 7 400 slope features with DSD sewers and drains nearby. We planned to carry out detailed investigation of those DSD sewers and drains in phases.

8. In November 2000, DSD commissioned consultants to carry out the phase 1 investigation work under **59BL**¹ "Investigation of sewers and drains affecting the safety of slope features in the new Government Catalogue of Slopes, phase 1", which covers about 4 100 slope features that have DSD sewers and drains nearby with potential consequences on buildings and major roads.

9. To complete the investigation of all DSD sewers and drains that may affect slope stability, we need to implement the phase 2 investigation. It will cover the rest of the slope features that have DSD sewers and drains and that would affect roads and open-space including playground, car parks and country parks nearby. We estimate that there will be about 3 300 slope features in these categories.

10. As we do not have sufficient information about the physical condition of these sewers and drains under the phase 2 investigation, we propose to conduct a pipe survey to record the condition of the buried services, identify the necessary remedial works, recommend an implementation programme and review and update the computerized Asset Inventory System (AIS) for effective management of these sewers and drains.

11. The investigation requires considerable resources over a specified period. Having examined in detail the nature and extent of the investigation, DSD concludes that he does not have the required expertise for the review and updating of the AIS and cannot re-deploy existing staff to cope with the substantial additional workload. He proposes to engage consultants to carry out the investigation.

/FINANCIAL

¹ Finance Committee approved the upgrading of **59BL** to Category A under **Head 704** at an estimated cost of \$165.6 million in money-of-the-day prices on 28 April 2000.

FINANCIAL IMPLICATIONS

12. We estimate the cost of the project to be \$143.3 million in MOD prices (see paragraph 13 below), made up as follows -

	\$ million
(a) Pipe survey	90.5
(b) Consultants' fees for –	26.0
(i) preparation of information on DSD sewers and drains, and preparation of drawings and tender documents	3.7
(ii) monitoring, administration and reporting on an internal pipe survey contract	1.9
(iii) review and updating of a computerised asset inventory system and survey database	2.0
(iv) recommendations on remedial measures with an implementation programme	5.4
(v) site supervision of pipe survey work	13.0
(c) Consultant's expenses (including computer facilities, extra copies of drawings and reports, etc)	0.5
(d) Environmental mitigation measures	0.5
(e) Contingencies	11.0

/Sub-total

	\$ million	
Sub-total	128.5	(in September 2000 prices)
(f) Provision for price adjustment	14.8	
Total	<u>143.3</u>	(in MOD prices)

A breakdown by man-months of the estimate for consultants' fees is at the Enclosure.

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

Year	\$ million (Sept 2000)	Price adjustment factor	\$ million (MOD)
2001 - 2002	1.1	1.02550	1.1
2002 - 2003	13.3	1.05627	14.0
2003 - 2004	38.9	1.08795	42.3
2004 - 2005	38.8	1.12059	43.5
2005 - 2006	24.1	1.15421	27.8
2006 - 2007	12.3	1.18884	14.6
	<u>128.5</u>		<u>143.3</u>

14. We have derived the MOD estimates on the basis of the Government's latest forecasts of trend labour and construction prices for the period 2001 to 2007. We will award the proposed consultancy on a lump sum basis with provision for price adjustment as the consultancy period will exceed 12 months. We will tender the pipe survey works under a re-measurement contract because the extent of the survey may vary depending on the site conditions. As the pipe survey contract will exceed 21 months, we will allow for price adjustment to the tender price.

15. This investigation will not give rise to annually recurrent expenditure.

/PUBLIC

PUBLIC CONSULTATION

16. We do not consider public consultation necessary. As the proposed investigation will not involve any construction works, inconvenience and disturbance to the public will be minimal.

ENVIRONMENTAL IMPLICATIONS

17. The proposed investigation will not have any long-term environmental impacts. For short-term nuisance during pipe surveys, we will implement standard mitigation measures, such as the use of silenced plant to reduce noise generation, in order to control impacts to within established criteria. The cost of implementing these pollution control measures is estimated to be \$0.5 million in September 2000 prices. We have included this amount in the project estimate.

18. The project will not generate construction and demolition materials.

LAND ACQUISITION

19. This proposed investigation does not require land acquisition.

BACKGROUND INFORMATION

20. It is Government policy to monitor and repair buried services near all slope features registered in the New Catalogue.

21. On 22 July 1996, Finance Committee approved the upgrading of **52BL** "Investigation of sewers and drains affecting the safety of fill slopes and retaining walls" to Category A at an estimated cost of \$64.3 million for the engagement of consultants to investigate the conditions of public sewers and drains behind and adjacent to fill slopes and retaining walls registered in the 1977-78 Catalogue of Slopes. The investigation under **52BL** started in August 1996 and was completed in July 2000.

22. On 16 January 1998, Finance Committee approved the upgrading of **54BL** "Investigation of sewers and drains affecting the safety of cut slopes" to Category A at an estimated cost of \$57.6 million for the engagement of consultants to investigate the conditions of public sewers and drains behind and adjacent to cut slopes registered in the 1977-78 Catalogue of Slopes. The investigation under **54BL** started in March 1998 and has been substantially completed.

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23. Based on the results of the investigation and the recommendations made under **52BL** and **54BL**, we have been carrying out necessary repair works to DSD sewers and drains under a maintenance programme. We plan to substantially complete the repair works before the wet season of 2001.

24. With the completion of the New Catalogue by GEO at the end of 1998 and the identification of a further 44 000 slope features, we engaged a consultant under the Category D item **A02BL** "Desktop study for identification of public sewers and drains behind and adjacent to slopes and retaining walls" to identify DSD sewers and drains near those newly-registered slope features. The consultancy, which started in October 1999 for completion by October 2001, will provide data in stages for the phase 1 and phase 2 investigation works. Our estimate of slope features requiring survey is about 4 100 for the phase 1 investigation and about 3 300 for the phase 2 investigation. These estimates may vary as the desktop study progresses.

25. On 28 April 2000, Finance Committee approved the upgrading of **59BL** "Investigation of sewers and drains affecting the safety of slope features in the new Government Catalogue of Slopes, phase 1" to Category A at an estimated cost of \$165.6 million for the engagement of consultants to investigate the conditions of public sewers and drains buried behind and adjacent to slope features in the New Catalogue that would affect buildings and major roads. **59BL** started in November 2000 and is scheduled for completion in October 2004. We will carry out the necessary repair works through a maintenance programme in December 2002 for completion in December 2004.

26. In respect of those sewers and drains under the proposed phase 2 investigation, we plan to commence the necessary repair works through a maintenance programme in 2004 for completion by end 2006.

27. We estimate that the project will create some 80 new jobs during the consultancy period. These will comprise 35 professional/technical staff and 45 labourers, totalling 2 700 man-months.

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Breakdown of estimates for consultants' fees

Consultants' staff costs			Estimated man-months	Average MPS* salary point	Multiplier factor	Estimated fee (\$ million)
(i)	Preparation of information on DSD sewers and drains, and preparation of drawings and tender documents	Professional	7	38	2.4	1.0
		Technical	59	14	2.4	2.7
(ii)	Monitoring, administration and reporting on internal pipe survey contract	Professional	10	38	2.4	1.4
		Technical	11	14	2.4	0.5
(iii)	Enhancement of a computerised asset inventory system and survey database	Professional	6.5	38	2.4	0.9
		Technical	24	14	2.4	1.1
(iv)	Recommendations on remedial proposals with an implementation programme	Professional	33	38	2.4	4.6
		Technical	17	14	2.4	0.8
(v)	Site supervision of pipe survey	Professional	49	38	1.7	4.8
		Technical	253	14	1.7	8.2
Total consultants' staff costs						26.0

* MPS = Master Pay Scale

Out-of-pocket expenses

(i) Consultants' expenses (including computer facilities, extra copies of drawings & reports, etc.)	0.5
Total out-of-pocket expenses	0.5

Notes :

- (1) A multiplier factor of 2.4 is applied to the average MPS point to arrive at the full staff costs including the consultants' overheads and profit, as the staff will be employed in the consultants' offices. (As at 1.4.2000, MPS pt. 38 = \$57,525 per month and MPS pt. 14 = \$19,055 per month) A multiplier factor of 1.7 is applied in the case of site staff supplied by the consultants.
- (2) Out-of-pocket expenses are the actual costs incurred. The consultants are not entitled to any additional payment for overheads or profit in respect of these items.
- (3) The figures given above are based on estimates prepared by the Director of Drainage Services. We will only know the actual man-months and actual fees when we have selected the consultants through the usual competitive lump sum fee bid system.

