

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

### **HEAD 708 – CAPITAL SUBVENTIONS AND MAJOR SYSTEMS AND EQUIPMENT**

#### **Universities**

#### **The Chinese University of Hong Kong**

#### **47EF – Stabilisation of slopes within the university campus, phase 13**

Members are invited to recommend to Finance Committee the upgrading of **47EF** to Category A at an estimated cost of \$75.5 million in money-of-the-day prices for repairing substandard slopes within the campus of the Chinese University of Hong Kong.

### **PROBLEM**

Stabilisation works are required for the substandard slopes within the campus of the Chinese University of Hong Kong (CUHK).

### **PROPOSAL**

2. The Secretary-General, University Grants Committee (SG, UGC), on the advice of the University Grants Committee (UGC) and the Director of Architectural Services (D Arch S) as UGC's Technical Adviser, and with the support of the Secretary for Education and Manpower, proposes to upgrade **47EF** to Category A at an estimated cost of \$75.5 million in money-of-the-day (MOD) prices for CUHK to carry out stabilisation works to substandard slopes under the university's maintenance responsibility.

## PROJECT SCOPE AND NATURE

3. The project comprises stabilisation works to 32 substandard slopes which show signs of distress. The slope stabilisation works will cover installation of soil nails, rock and soil trimming, re-compaction of fill materials, buttress and dentition, etc. The project also includes necessary repairs or remedial works to underground water services structures in the vicinity of the slopes. To soften the visual impact of hard surfaces resulting from these works, CUHK will carry out landscaping and other environmental improvement works.

4. A site plan is at Enclosure 1. CUHK will carry out the works in four packages. Works will start in July 2005 for completion in March 2008.

## JUSTIFICATION

5. Before 1999, slope stabilisation works were the subject of Dangerous Hillside Orders (DHOs) issued by the Building Authority pursuant to the Building Ordinance. Those slopes used to be included in the Landslip Preventive Measures (LPM) Accelerated Programmes under the Geotechnical Engineering Office (GEO) of the then Civil Engineering Department. In 1999, an understanding was reached with GEO that in view of CUHK's relatively well organised and systematic approach to slope stabilisation works, GEO needed not include slopes on the CUHK campus in their LPM Accelerated Programmes for survey and assessment, and no DHOs would be issued as a result. CUHK was to conduct its own survey and assessment with the assistance of professional consultants. Against this background, the geotechnical consultants engaged by CUHK recommended stabilisation works to 32 slopes showing signs of distress and possible instability. To provide a safe environment for students and staff and to meet statutory requirements, slope stabilisation works should be carried out in a timely manner. Failing which the substandard slopes may deteriorate and landslides may occur causing injury to passers-by and students and staff in the vicinity, damage to property and disruption to normal life.

## FINANCIAL IMPLICATIONS

6. SG, UGC, on the advice of D Arch S, recommends approval of the project at a cost of \$75.5 million in MOD prices (see paragraph 8 below), made up as follows –

/(a) .....

		<b>\$ million</b>	
(a)	Stabilisation works	60.0	
(b)	Landscaping works and surface finishing works against erosion	3.6	
(c)	Consultants' fees for –	6.6	
	(i) Tender assessment	0.3	
	(ii) Contract administration	0.5	
	(iii) Site supervision	5.7	
	(iv) Out-of-pocket expenses	0.1	
(d)	Contingencies	4.9	
	Sub-total	75.1	(in September 2004 prices)
(e)	Provision for price adjustment	0.4	
	Total	75.5	(in MOD prices)

7. CUHK proposes to engage consultants to undertake tender assessment, contract administration and site supervision of the project. A detailed breakdown of the estimate for consultants' fees by man-months is at Enclosure 2.

8. Subject to approval, CUHK will phase the expenditure as follows –

<b>Year</b>	<b>\$ million (Sept 2004)</b>	<b>Price adjustment factor</b>	<b>\$ million (MOD)</b>
2005 – 06	14.5	1.00450	14.6
2006 – 07	19.0	1.00576	19.1
2007 – 08	25.0	1.00576	25.1
2008 – 09	16.6	1.00576	16.7
	75.1		75.5

/9. ....

9. We have derived the MOD estimate on the basis of the Government's latest forecast of trend rate of change in the prices of public sector building and construction output for the period 2005 to 2009. CUHK will deliver the works through a lump-sum contract because it can clearly define the scope of works in advance. The contract will not provide for price adjustment.

10. The project will have no impact on tuition fees. Any additional recurrent costs associated with this project will be absorbed by CUHK and the proposal has no additional recurrent implications on the Government.

### **PUBLIC CONSULTATION**

11. We consulted the Legislative Council Panel on Education on the proposed works by circulation of an information paper on 30 May 2005. We have not received any adverse comment from members.

### **ENVIRONMENTAL IMPLICATIONS**

12. CUHK completed a Preliminary Environmental Review (PER) for the project in October 2004. The PER concluded that the project would have no long-term environmental impact. The Director of Environmental Protection vetted the PER and agreed that an Environmental Impact Assessment would not be required.

13. During construction, CUHK will control noise, dust and site run-off nuisances to within established standards and guidelines through the implementation of mitigation measures in the relevant contracts. These include the use of silencers, mufflers, acoustic lining or shields for noisy construction activities, frequent cleaning and watering of the site, and the provision of wheel-washing facilities.

14. At the planning and design stages, we have taken into consideration the site profile and contours against various stabilisation construction options with a view to minimising cutting and excavation. CUHK will use suitable excavated materials for filling within the site to minimise off-site disposal. To minimise the generation of construction and demolition (C&D) materials, CUHK will encourage the contractors to use non-timber formwork and recyclable materials for temporary works. In addition, CUHK will require the contractor to use metal site hoardings and signboards so that these materials can be recycled or reused in other projects.

15. CUHK will require the contractor to submit a waste management plan (WMP) for approval. The WMP will include appropriate mitigation measures to avoid, reduce, reuse and recycle C&D materials. CUHK will ensure that the day-to-day operations on site comply with the approved WMP. CUHK will control the disposal of public fill and C&D waste to designated public filling facilities and landfills respectively through a trip-ticket system. CUHK will require the contractor to separate public fill from C&D waste for disposal at appropriate facilities. CUHK will record the disposal, reuse and recycling of C&D materials for monitoring purposes. CUHK will provide training to workers about the concepts of site cleanliness and appropriate waste management procedure, including waste reduction, reuse and recycling. CUHK estimates that the project will generate about 22 000 cubic metres (m<sup>3</sup>) of C&D materials. Of these, CUHK will reuse about 12 100 m<sup>3</sup> (55%) on site, 6 600 m<sup>3</sup> (30%) as fill in public filling areas<sup>1</sup>, and dispose of 3 300 m<sup>3</sup> (15%) at landfills. The notional cost of accommodating C&D waste at landfill sites is estimated to be \$412,500 for this project (based on a notional unit cost<sup>2</sup> of \$125/m<sup>3</sup>).

## LAND ACQUISITION

16. The project does not require land acquisition.

## BACKGROUND INFORMATION

17. Under existing procedures, UGC-funded institutions submit capital works proposals to the UGC annually. The UGC examines all these proposals carefully, with professional advice provided by D Arch S who acts as UGC's Technical Adviser. The UGC refers those supported proposals to the Government. Having examined CUHK's proposal, SG, UGC has, in consultation with D Arch S, adjusted the project estimate proposed by CUHK to arrive at the project estimate set out in paragraph 2 above. A comparison of the project estimate proposed by CUHK and the revised estimate recommended by the UGC and agreed by CUHK is at Enclosure 3.

18. The CUHK campus is built on a hillside, and has over 280 registered slope features. Since 1996, CUHK has been carrying out the required stabilisation works in phases, including the following major works –

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<sup>1</sup> 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 and Development.

<sup>2</sup> 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/m<sup>3</sup>), 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.

Project code	Date of approval by Finance Committee	Number of slopes	Approved project estimate (in MOD prices) \$ million	Date of completion
36EF	12 December 1997	16	75.30	December 2002
40EF	21 January 2000	21	53.17	February 2004
44EF	12 April 2002	48	120.90	May 2006

19. We upgraded **47EF** to Category B in January 2005. CUHK engaged consultants to carry out stability assessment of the 32 slopes and the detailed design for the stabilisation works. This was done in three phases at an estimated cost of \$15 million each, and was funded under block allocation **Subhead 8100EX** "Alterations, additions, repairs and improvements to the campuses of the UGC-funded institutions". The consultants have completed the assessment and detailed design work.

20. The proposed slope stabilisation works will involve removal of 25 trees, including 20 trees to be felled and five trees to be transplanted elsewhere within the campus. All trees to be removed are not important trees<sup>3</sup>. CUHK will incorporate planting proposals as part of the project, including estimated quantities of 60 trees and 21 000 square metres of grassed area.

21. We estimate that the proposed works will create about 75 jobs (60 for labourers and another 15 for professional/technical staff) providing a total employment of 1 850 man-months.

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Education and Manpower Bureau  
May 2005

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<sup>3</sup> Important trees include trees on the Register of Old and Valuable Trees, and any other trees which meet one or more of the following criteria –

- (a) trees over 100 years old;
- (b) trees of cultural, historical or memorable significance;
- (c) trees of precious or rare species;
- (d) trees of outstanding form; or
- (e) trees with trunk diameter exceeding one metre (measured at one metre above ground level).



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**Breakdown of the estimate for consultants' fees**

		Estimated man- months	Average MPS* salary point	Multiplier (Note 1)	Estimated fees (\$ million)
(a) Consultants' fees <sup>(Note 2)</sup>					
(i) Tender assessment	Professional	1.8	38	2.0	0.2
	Technical	1.9	14	2.0	0.1
(ii) Contract administration	Professional	3.7	38	2.0	0.4
	Technical	2.2	14	2.0	0.1
(b) Site supervision <sup>(Note 3)</sup>	Professional	43.3	38	1.6	3.8
	Technical	65.2	14	1.6	1.9
Sub-total					6.5
(c) Out-of-pocket expenses <sup>(Note 4)</sup>					
Lithography and other direct expenses					0.1
Total					6.6

\* MPS = Master Pay Scale

**Notes**

1. A multiplier of 2 is applied to the average MPS point to estimate the full staff costs including the consultants' overheads and profit as the staff will be employed in the consultants' offices. A multiplier of 1.6 is applied in the case of contract staff employed by CUHK direct on the project. (As at 1 January 2005, MPS point 38 = \$54,255 per month and MPS point 14 = \$18,010 per month.)
2. The consultants' fees for tender assessment and contract administration are devised in accordance with the existing consultancy agreements obtained through competitive tendering for the design and construction of 47EF. The assignment will only be executed subject to Finance Committee's approval to upgrade 47EF to Category A.

3. CUHK will only know the actual man-months and actual costs for site supervision after completion of the works.
4. Out-of-pocket expenses are the actual costs incurred. The consultants are not entitled to any additional payment for the overheads or profit in respect of these items.

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**A comparison of the project estimate proposed by CUHK  
with the estimate recommended by UGC**

**\$ million (in September 2004 prices)**

<b>Project</b>	<b>Amount proposed by CUHK</b>	<b>Amount recommended by UGC</b>	<b>Amount of reduction</b>
CUHK – Stabilisation of slopes within the university campus, phase 13	77.4	75.1	2.3

**Note**

The net reduction of \$2.3 million results from trimming the estimate on –

- (a) landscaping works and surface finishing works against erosion by \$500,000;
- (b) consultants' fees by \$600,000; and
- (c) contingencies by \$1.2 million.