

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

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

#### **Universities**

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

#### **46EF – Teaching complex at western campus**

Members are invited to recommend to Finance Committee the upgrading of **46EF** to Category A at an estimated cost of \$204.8 million in money-of-the-day prices for the construction of a teaching complex at the western campus for the Chinese University of Hong Kong.

### **PROBLEM**

The Chinese University of Hong Kong (CUHK) does not have adequate space for accommodating additional communal teaching facilities and research laboratories.

### **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 **46EF** to Category A at an estimated cost of \$204.8 million in money-of-the-day (MOD) prices for the construction of CUHK's teaching complex at the western campus.

## PROJECT SCOPE AND NATURE

3. The scope of **46EF** comprises the following –
- (a) demolition of the existing Li Dak Sum Building with a net operational floor area (NOFA) of 839 square metres (m<sup>2</sup>) now mainly used for office and some teaching activities;
  - (b) construction of a new eight-storey communal teaching and research complex of 6 286 m<sup>2</sup> in NOFA at the western campus across central CUHK;
  - (c) construction of a footbridge linking the complex to the United College;
  - (d) provision of 32 carparking spaces; and
  - (e) temporary reprovisioning of the existing accommodation at Li Dak Sum Building during the redevelopment period and consequential/reprovision works on completion of the complex.

4. A site plan is at Enclosure 1. The lower floors of the complex contain eight major lecture halls with seating capacity ranging from 150 to 460. The middle floors accommodate three classrooms/seminar rooms and 40 research laboratories. There are also two work stations and suites for research activities, three offices and a meeting room on the top floors. A list of facilities, sectional plan and view of the complex (artist's impression) are at Enclosures 2 to 4 respectively. CUHK plans to start the construction works in the first quarter of 2005 for completion in the second quarter of 2007.

## JUSTIFICATION

5. The space and accommodation requirements of UGC-funded institutions were re-examined in April 2004. According to the results, CUHK has about 12% shortfall in space provision (i.e. about 21 600 m<sup>2</sup> in NOFA), of which the majority is teaching facilities and research laboratories. This has already taken into account some 18 000 m<sup>2</sup> in NOFA of space provision with some 9 700 m<sup>2</sup> for research laboratories that will be made available upon completion of three on-going projects (i.e. **37EF** "Extension facilities for the clinical departments of the Faculty of Medicine at Prince of Wales Hospital", **38EF** "Engineering Building Complex, phase 2" and **43EF** "A purpose-designed building for centralised science

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laboratories”). CUHK therefore needs additional space provision. The complex will provide a net additional 5 447 m<sup>2</sup> in NOFA (after deducting 839 m<sup>2</sup> for the demolition of Li Dak Sum Building) with 2 685 m<sup>2</sup> for research laboratories, and will reduce the overall shortfall to 9%.

6. There is a strong demand for the additional accommodation to be provided in the form of communal teaching facilities. In addition, the existing teaching facilities, for non-science subjects in particular, are scattered all over the campus, from Chung Chi College at the foot of the hill to New Asia and United Colleges at the top of the hill. It is difficult for students and teaching staff to go quickly from one teaching block to another where they are a long distance apart, especially in between classes. Having communal teaching facilities in the more centrally located western campus can effectively address these problems.

7. The existing Li Dak Sum Building is a three-storey building with only 839 m<sup>2</sup> in NOFA located on an uneven site. It does not represent optimal space usage. Moreover, the building was constructed some twenty years ago. Its configuration is outdated and cannot meet the current and projected demands for communal teaching and large-size lecturing. Upgrading facilities therein would be of little help in alleviating the space shortfall and is not a cost-effective option. We therefore recommend demolishing Li Dak Sum Building and make available the site for the complex. During the redevelopment, the existing facilities in Li Dak Sum Building will be temporarily accommodated in various buildings of the campus through reshuffling of space.

8. The construction of a footbridge linking the complex to the United College is required in order to provide a safer and more convenient pedestrian passageway for students, staff and visitors who need to travel between the western campus and facilities further uphill. CUHK estimates that the footbridge will reduce travelling time by about ten minutes. It will also promote travelling on foot instead of by school buses, in line with CUHK’s long-term strategy for on-campus transportation. The carparking spaces, which are mainly re-provisioning of the existing ones to be displaced upon demolition of Li Dak Sum Building, are also essential for use by CUHK’s teaching and non-teaching staff, visitors and the disabled.

## **FINANCIAL IMPLICATIONS**

9. SG, UGC, on the advice of D Arch S, recommends approval of the project at a cost of \$204.8 million in MOD prices (see paragraph 12 below), made up as follows –

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		<b>\$ million</b>	
(a)	Demolition	3.4	
(b)	Site formation	8.8	
(c)	Footbridge	2.4	
(d)	Building	86.5	
(e)	Building services	49.6	
(f)	Drainage	1.9	
(g)	External works	6.1	
(h)	Consultants' fees for –	6.2	
	(i) Tender assessment	0.4	
	(ii) Contract administration	2.4	
	(iii) Site supervision	3.2	
	(iv) Out-of-pocket expenses	0.2	
(i)	Furniture and equipment <sup>1</sup>	18.9	
(j)	Temporary works during redevelopment period and subsequent consequential/reprovision works	4.2	
(k)	Contingencies	18.8	
	Sub-total	206.8	(in September 2004 prices)
(l)	Provision for price adjustment	(2.0)	
	Total	204.8	(in MOD prices)

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<sup>1</sup> Based on 12.5% of the building and building services costs of the project estimate and to cover specialist audio-visual equipment required for the lecture halls.

10. 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 5.

11. The construction floor area (CFA) of this project is 12 643 m<sup>2</sup>. The estimated construction unit cost, represented by the building and building services costs, is \$10,765 per m<sup>2</sup> of CFA in September 2004 prices. D Arch S considers the estimated construction unit cost reasonable and comparable with those of similar projects such as 9EL "Enterprise Centre" of the Hong Kong University of Science and Technology (upgraded to Category A in February 2004 with an estimated construction unit cost of \$11,048 per m<sup>2</sup> of CFA in September 2004 prices). A detailed account of the CFA vis-à-vis the construction unit cost of 46EF is at Enclosure 6.

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

Year	\$ million (Sept 2004)	Price adjustment factor	\$ million (MOD)
2004 – 05	4.6	1.00000	4.6
2005 – 06	52.6	0.99000	52.1
2006 – 07	38.9	0.98753	38.4
2007 – 08	110.7	0.99123	109.7
	206.8		204.8

13. 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 2004 to 2008. CUHK will tender the works through a fixed-price lump-sum contract because it can clearly define the scope of works in advance, leaving little room for uncertainty.

14. The project will have no impact on tuition fees. The 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**

15. Public consultation is not necessary as the construction works will be carried out within the campus of CUHK.

## **ENVIRONMENTAL IMPLICATIONS**

16. CUHK completed a Preliminary Environmental Review (PER) for the project in August 2002. 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.

17. 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.

18. At the planning and design stages, CUHK has considered measures to reduce the generation of construction and demolition (C&D) materials. CUHK will use suitable excavated materials for filling within the site to minimise off-site disposal. To further minimise the generation of C&D materials, CUHK will encourage the contractor 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.

19. 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 recycle the C&D materials for monitoring purposes. CUHK estimates that the project will generate about 18 500 cubic metres (m<sup>3</sup>) of C&D materials. Of these, CUHK will reuse about 11 000 m<sup>3</sup> (59.4%) on site, 4 000 m<sup>3</sup> (21.6%) for CUHK's other slope

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improvement works which will be carried out inside the campus, 3 250 m<sup>3</sup> (17.6%) as fill in public filling areas<sup>2</sup>, and dispose of 250 m<sup>3</sup> (1.4%) at landfills. The notional cost of accommodating C&D waste at landfill sites is estimated to be \$31,250 for this project (based on a notional unit cost<sup>3</sup> of \$125/m<sup>3</sup>).

## LAND ACQUISITION

20. The project does not require land acquisition.

## BACKGROUND INFORMATION

21. 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 7.

22. We upgraded **46EF** to Category B in November 2003. CUHK engaged consultants to carry out site investigation and preliminary design work in June 2002 and to prepare detailed design and tender documents in May 2004 at a total cost of \$8.5 million. We charged this amount to block allocation **Subhead 8100EX** "Alterations, additions, repairs and improvements to the campuses of the UGC-funded institutions". The consultants have completed the site investigation, preliminary design and detailed design of the project. CUHK is finalising the tender documents for the project.

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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 purposes. Disposal of public fill in a public filling area requires a licence issued by the Director of Civil Engineering and Development.

<sup>3</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 exiting ones are filled. The notional cost estimate is for reference only and does not form part of this project estimate.

23. The proposed construction of the complex will involve removal of 138 trees, including 108 trees to be felled and 30 trees to be transplanted elsewhere within the campus. All trees to be removed are not important trees<sup>4</sup>. CUHK will incorporate planting proposals as part of the project, including estimated quantities of 164 trees, ten to 12 shrubs, and 543 m<sup>2</sup> of grassed area.

24. CUHK estimates that the proposed works will create about 200 jobs (147 for labourers and another 53 for professional/technical staff) providing a total employment of 5 587 man-months.

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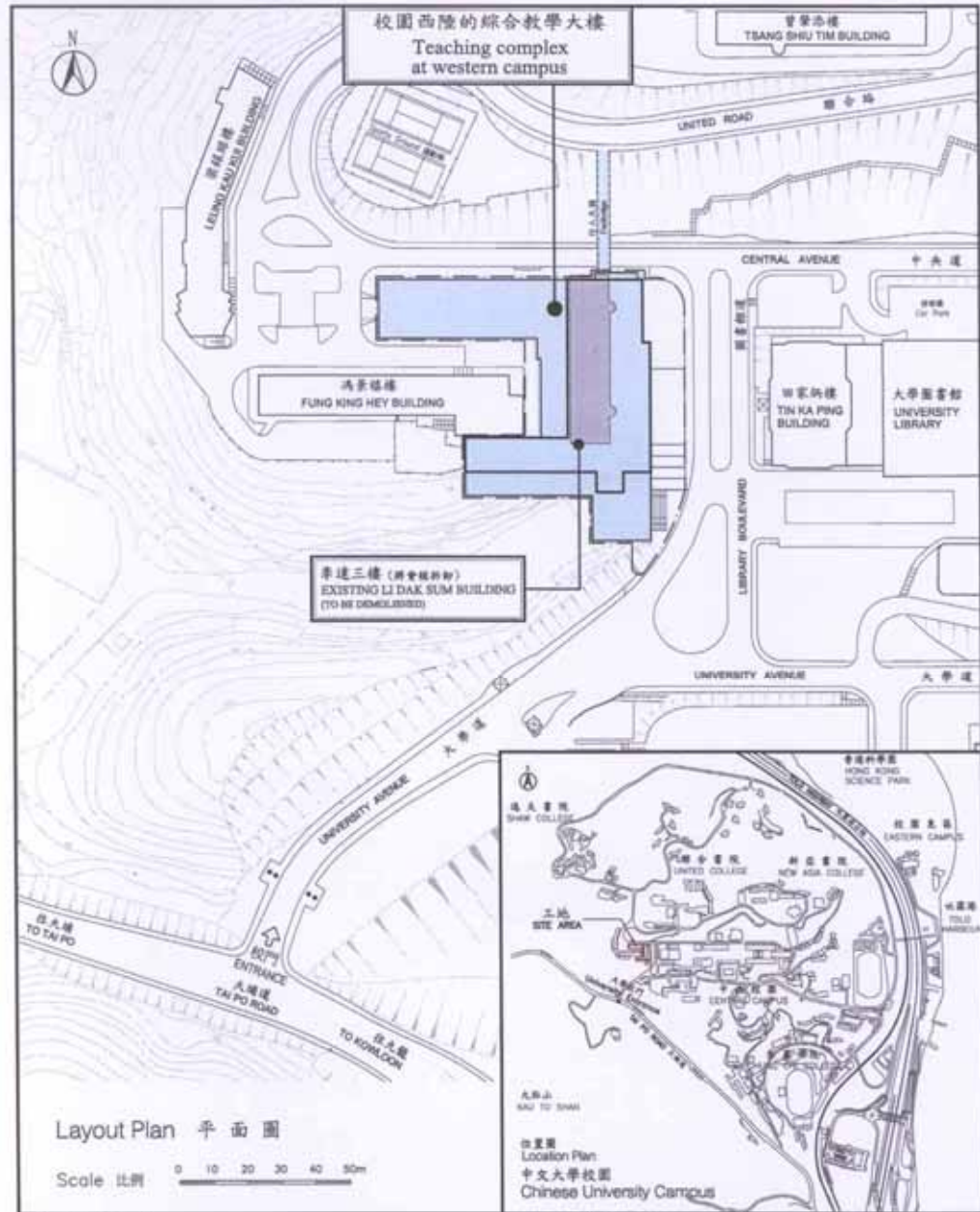
Education and Manpower Bureau  
November 2004

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<sup>4</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).





Layout Plan 平面圖  
Scale 比例 0 10 20 30 40 50m

8046EF - 校園西陞的綜合教學大樓  
Teaching complex at western campus

No.	Description	Date

  
 Campus Development Office, CUHK  
 香港中文大學·校園發展處

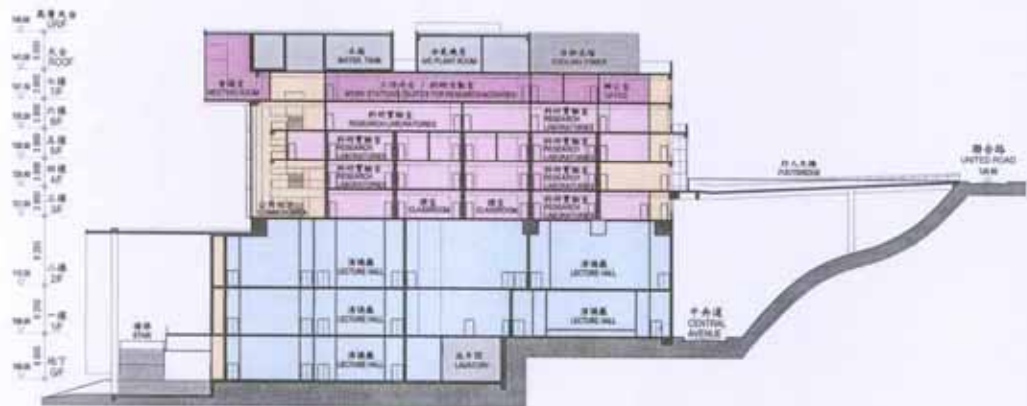
Project No.	WONG	Date	15th Oct, 04
Design	M. LAM	Scale	As shown
CUHK	S-F-010	Drawing No.	BF-240

**The Chinese University of Hong Kong  
46EF – Teaching complex at western campus**

**List of facilities**

<b>Facilities</b>	<b>Estimated floor area in net operational floor area (NOFA) (m<sup>2</sup>)</b>
(a) Research laboratories	2 685
(b) Lecture halls	2 452
(c) Offices and a meeting room	665
(d) Classrooms/seminar rooms	398
(e) Work stations and suites for research activities	86
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Total	6 286
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### 8046EF - 校園西陲的綜合教學大樓 Teaching complex at western campus



8046EF - 校園西陲的綜合教學大樓  
Teaching complex at western campus



從東南面望向教學大樓的構思圖  
View of the teaching complex from south-eastern direction (artist's impression)

**The Chinese University of Hong Kong**  
**46EF – Teaching complex at western campus**

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

		Estimated man- months	Average MPS* salary point	Multiplier (Note 2)	Estimated fees (\$ million)
(a) Consultants' fees <sup>(Note 1)</sup>					
(i) Tender assessment	Professional	–	–	–	0.3
	Technical	–	–	–	0.1
(ii) Contract administration	Professional	–	–	–	1.7
	Technical	–	–	–	0.7
(b) Site supervision <sup>(Note 3)</sup>	Professional	24.6	38	1.6	2.2
	Technical	33.6	14	1.6	1.0
				Sub-total	6.0
(c) Out-of-pocket expenses <sup>(Note 4)</sup>					
Lithography and other direct expenses					0.2
				Sub-total	0.2
				Total	6.2

\* **MPS = Master Pay Scale**

**Notes**

- 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 **46EF**. The assignment will only be executed subject to Finance Committee's approval to upgrade **46EF** to Category A.
- A multiplier of 1.6 is applied to the average MPS point to estimate the staff costs for contract staff employed by CUHK direct on the project. (As at 1 January 2004, MPS point 38 = \$55,993 per month, and MPS point 14 = \$18,603 per month.)

3. Having examined the site supervision costs estimated by CUHK, the Director of Architectural Services considered the figures acceptable. The actual man-months and actual costs for site supervision shall only be known after completion of the construction 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.

**The Chinese University of Hong Kong  
46EF – Teaching complex at western campus**

**Breakdown of the construction floor area (CFA) vis-à-vis the construction unit cost**

(a) Breakdown of CFA

	<b>Estimated floor area (m<sup>2</sup>)</b>
Net operational floor area (NOFA)	6 286
Circulation areas and toilets	5 297
Mechanical and electrical plants	1 060
CFA	<hr/> 12 643 <hr/>

(b) NOFA/CFA ratio<sup>5</sup> 50%

(c) Estimated construction unit cost (represented by the building and building services costs) \$10,765 per m<sup>2</sup> of CFA  
(in September 2004 prices)

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<sup>5</sup> The NOFA/CFA ratio is 45% for **38EF** “Engineering Building Complex, phase 2”, 47% for **43EF** “A purpose-designed building for centralised science laboratories” and 44% for **37EF** “Extension facilities for the clinical departments of the Faculty of Medicine at Prince of Wales Hospital” of the Chinese University of Hong Kong upgraded to Category A in May 2001, April 2002 and April 2002 respectively.

**The Chinese University of Hong Kong  
46EF – Teaching complex at western campus**

**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 – Teaching complex at western campus	\$222.8	\$206.8	16

**Notes**

The net reduction of \$16 million results from trimming the estimate on –

- (a) construction cost by \$1.3 million;
- (b) consultants' fees and site supervision cost by \$4.2 million;
- (c) furniture and equipment by \$9 million; and
- (d) contingencies by \$1.5 million.