

**For discussion
on 4 April 2001**

PWSC(2001-02)1

ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

HEAD 708 - CAPITAL SUBVENTIONS AND MAJOR SYSTEMS AND EQUIPMENT

Universities

The Chinese University of Hong Kong

38EF - Engineering Building Complex, phase 2

Members are invited to recommend to Finance Committee to approve a new commitment of \$247.47 million in money-of-the-day prices for the phase 2 development of the Engineering Building Complex of the Chinese University of Hong Kong.

PROBLEM

The Faculty of Engineering of the Chinese University of Hong Kong (CUHK) requires additional accommodation and facilities to meet its teaching and research needs.

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 the creation of a new commitment of \$247.47 million in money-of-the-day (MOD) prices for the construction of CUHK's Engineering Building Complex, phase 2.

/PROJECT

PROJECT SCOPE AND NATURE

3. The scope of project **38EF** comprises the following -
- (a) construction of a new ten-storey complex;
 - (b) construction of access roads connecting to the Ho Sin Hang Engineering Building (Engineering Building Complex, phase 1);
 - (c) construction of a footbridge linking the podium of the new building to the central campus for pedestrian access; and
 - (d) consequential works in Lady Shaw Building, Engineering Building Complex, phase 1 and Science Centre of CUHK.
4. The development will provide a total net floor area (NFA) of about 5 000 square metres to meet the Faculty's current shortfall. When completed, it will house the Department of Automation and Computer-aided Engineering and the Department of Material Engineering which require an NFA of 1 800 square metres and 1 000 square metres respectively. The remaining 2 200 square metres will be occupied by other departments of the Faculty, and will provide space for teaching, research and other ancillary facilities. The self-contained complex will house special laboratories and workshops (with heavy load-bearing floors, extensive headroom, large workspace and special exhaust facilities) and facilities such as dangerous goods stores and a clean room system. The site plan of the project is at Enclosure 1. CUHK plans to start the construction works in August 2001 for completion in August 2004.

JUSTIFICATION

5. According to a study on space and accommodation at UGC-funded institutions completed in February 2000, CUHK has a shortfall of 22% (NFA of 36 937 square metres) in accommodation provision. Of this, the Faculty of Engineering suffers a shortfall of 5 300 square metres.
6. The Faculty of Engineering, founded in 1991 with four departments¹ initially, is housed in the Engineering Building Complex, phase 1 built in 1993.

/Since

¹ The four founding departments of the Faculty of Engineering are Department of Electronic Engineering, Department of Computer Science and Engineering, Department of Information Engineering and Department of System Engineering & Engineering Management.

Since then, the number of engineering students has increased by 83%, from about 1 300 in 1993/94 to 2 379 in 2000/01. Two new departments as mentioned in paragraph 4 were established in 1994/95 and 2000/01 respectively with no additional space provided. This shortage of space has hampered the development of the engineering programme.

7. For engineering studies, much of the learning is done through hands-on experience gained in laboratories. Some laboratories have special requirements such as heavy load-bearing floors, dust-free atmosphere or secured areas to store chemicals and gases. These cannot be readily provided by simple modifications to existing premises. Furthermore, universities are currently conducting a greater amount of basic and applied research. Increased research activities place additional demands on space and require tailor-designed facilities. In view of the above, the UGC supports the construction of a specially-designed and fitted-out building.

FINANCIAL IMPLICATIONS

8. SG, UGC, on the advice of D Arch S, recommends approval of the project at a cost of \$247.47 million in MOD prices, made up as follows -

	\$ million
(a) Site formation	7.98
(b) Footbridge and access road	9.16
(c) Drainage and utilities diversion	2.75
(d) Building	85.00
(e) Building services	65.98
(f) Consultants' fees for	8.64 ²
(i) assessment of tenders	0.70

/(ii)

² \$4.19 million of the total consultants' fees of \$8.64 million is for the lead and geotechnical consultants calculated on a scale fee basis, including \$600,000 under 'assessment of tenders' and \$3.59 million under 'contract administration'. CUHK commissioned the consultancy services for this project and project '37EF - Extension Facilities for the Clinical Departments of the Medical Faculty at Prince of Wales Hospital' in June 1998 and March 1998 respectively on a scale fee basis. These two projects were inadvertently omitted from the list of remaining consultancy contracts awarded on a scale fee basis as presented in the March 1999 Supplementary Information Note for Public Works Subcommittee of Finance Committee number PWSCI(98-99)32 on '18EH - University hostels at Baptist University Road - phase 1 and phase 2'.

	\$ million	
(ii) contract administration	4.24	
(iii) site supervision	3.54	
(iv) out-of-pocket expenses	0.16	
(g) Furniture and equipment	25.08	
(h) Consequential works ³	6.00	
(i) Contingencies	14.74	
	<hr/>	
Sub-total	225.33	(at September 2000 prices)
(j) Provision for price adjustment	22.14	
	<hr/>	
Total	247.47	(in MOD prices)
	<hr/>	

9. The construction floor area of this project is 11 007 square metres. The construction unit cost, represented by building and building services costs, is \$13,717 per square metre in September 2000 prices. D Arch S considers the estimated unit costs reasonable and comparable with those of similar projects, such as **22EK**, Phase VI development of Hong Kong Polytechnic University (upgraded to Category A in February 1997, the construction unit cost of which was \$12,242 per square metre in September 2000 prices).

10. A detailed breakdown by man-months of the estimates for the consultants fees is at Enclosure 2.

11. Subject to Members' approval, CUHK will phase the expenditure of the project as follows -

/Year

³ A NFA of 1 700 square metres in Lady Shaw Building, Engineering Building Complex, phase 1 and Science Centre of CUHK will be vacated after reprovisioning of facilities to the new Engineering Building Complex, phase 2. \$6 million will be required to convert the space vacated into laboratories, work rooms, workshops and offices for use by the Faculty of Engineering (700 square metres) and other faculties (1 000 square metres) of the CUHK. This cost is considered reasonable by D Arch S.

Year	\$ million (Sept 2000)	Price Adjustment Factor	\$ million (MOD)
2001 - 02	10.50	1.02550	10.77
2002 - 03	32.00	1.05627	33.80
2003 - 04	82.00	1.08795	89.21
2004 - 05	80.11	1.12059	89.77
2005 - 06	20.72	1.15421	23.92
	225.33		247.47

12. We derived the MOD estimates on the basis of the Government's forecast of trend labour and construction prices for the period 2001 to 2006. CUHK will tender the works under a fixed-price lump-sum contract because the scope of works can be clearly defined in advance, leaving little room for uncertainty.

13. The project will have no impact on tuition fees. CUHK has confirmed that it will meet the additional recurrent costs associated with this project from its recurrent grants.

PUBLIC CONSULTATION

14. We do not consider public consultation necessary as the construction will be carried out within the campus of CUHK.

ENVIRONMENTAL IMPLICATIONS

15. We completed a Preliminary Environmental Review (PER) for the project in August 1997. The PER concluded and the Director of Environmental Protection agreed that there would be no long-term environmental impacts from the proposed building complex. No Environmental Impact Assessment would be required.

16. 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 works contracts. These include the use of noise suppression baffles and silencers, wheel washing facilities and dust suppression equipment as well as regular watering of the site.

17. At the planning and design stages, we have taken into consideration the site profile and contours with a view to minimizing cutting and excavation. To further minimise the generation of construction and demolition (C&D) materials, CUHK will encourage the contractor to use steel instead of timber in formwork and temporary works. CUHK estimates that some 5 300 cubic metres (m³) of C&D materials will be generated from execution of the project. Of these, about 3 800m³ (72%) will be reused on site, 650m³ (12%) will be reused as fill in public filling areas⁴ and about 850m³ (16%) will be disposed of at landfills. CUHK will require the contractor under the contract to submit, for approval, a waste management plan (WMP) with appropriate mitigation measures, including the allocation of areas for waste segregation on-site to facilitate reuse or recycling of C&D materials. CUHK will ensure that the day-to-day operations on site comply with the approved WMP and will implement a trip-ticket system to control the proper disposal of C&D materials. CUHK will also record the reuse, recycling and disposal of C&D materials for monitoring purposes.

LAND ACQUISITION

18. The project does not require land acquisition.

BACKGROUND INFORMATION

19. 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 proposals it supports 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 estimates recommended by the UGC (agreed by CUHK) is at Enclosure 3.

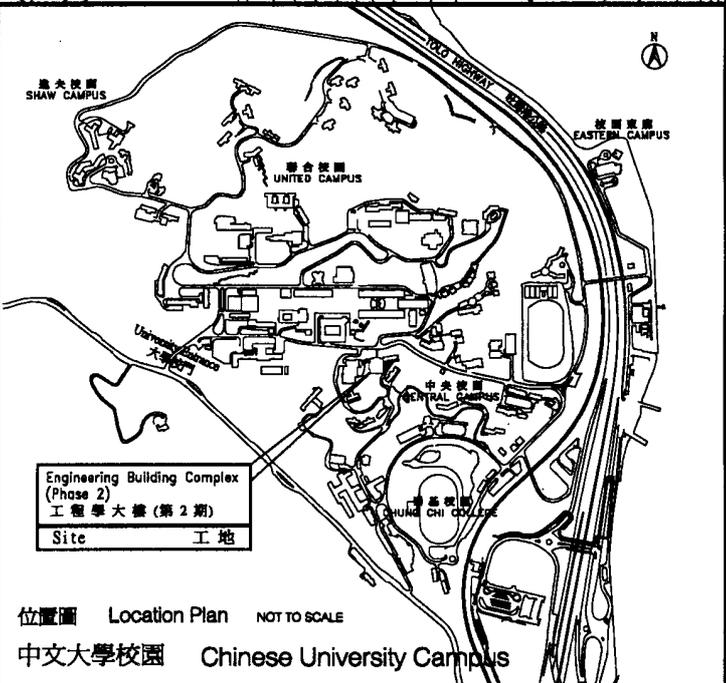
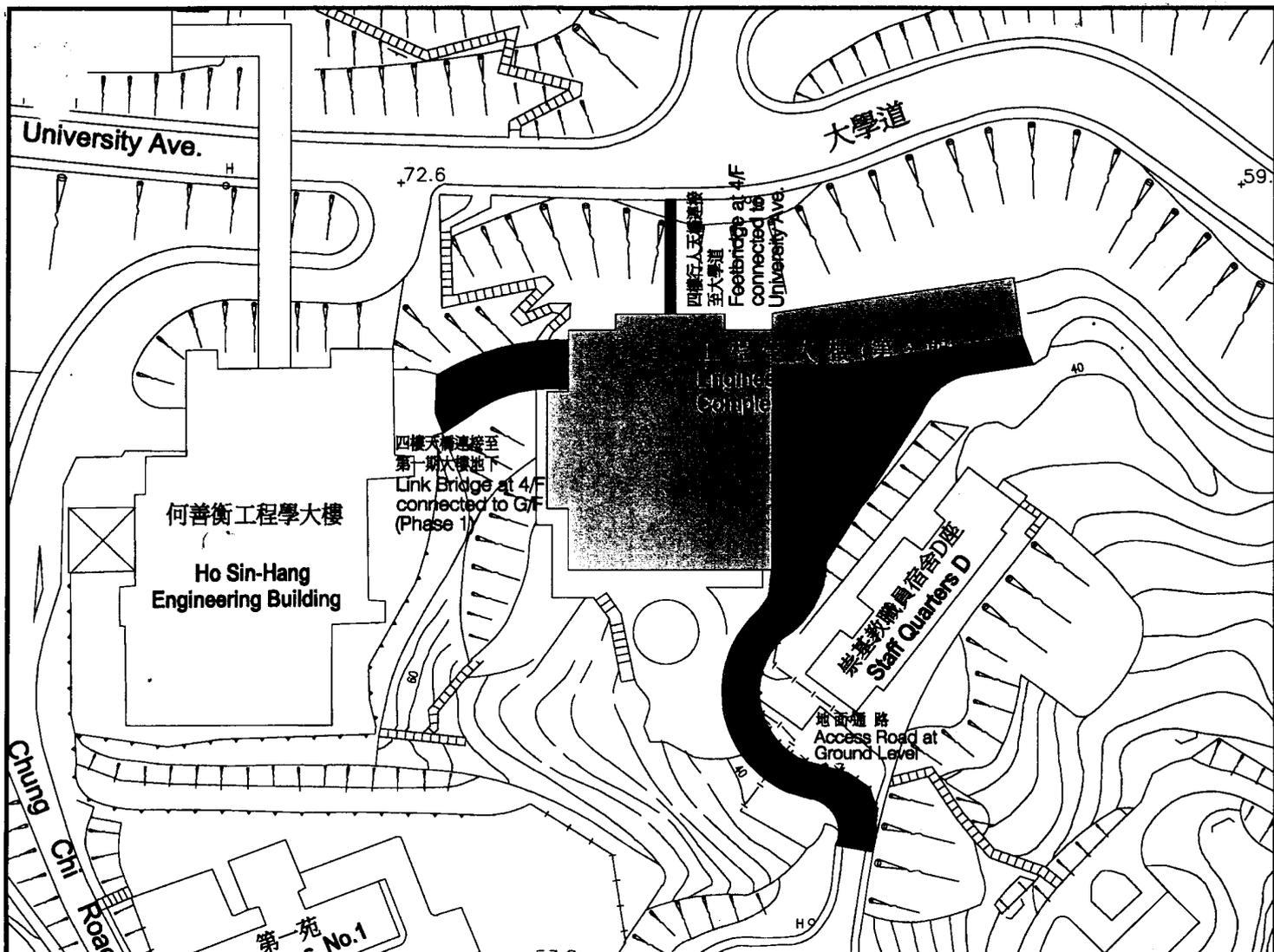
/20.

⁴ 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.

20. We upgraded **38EF** to Category B in September 1998. With an allocation of \$9.87 million from block allocation Subhead **8100EX** - 'Alternations, additions, repairs and improvements to the campuses of the UGC-funded institutions', consultants engaged by the CUHK have completed most of the pre-tender consultancy services including feasibility study, site investigation, detailed design and tender documentation. CUHK is in the process of finalizing tender documents for the project.

21. CUHK estimates that **38EF** will create about 125 jobs, with a total of 4 130 man-months, comprising five professional staff, 10 technical staff and 110 labourers during the construction period.

Education and Manpower Bureau
April 2001



LAYOUT PLAN 規劃平面圖

比例尺 SCALE 1 : 1000

位置圖 Location Plan NOT TO SCALE

中文大學校園 Chinese University Campus

DRAWING TITLE 圖則名稱

8038EF-Engineering Building Complex (Phase 2)
工程學大樓 (第 2 期)

REVISIONS 修訂

Description	Date



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

Drawn by 製圖	Date 日期	
C.WONG	Feb, 2001	
Checked by 審核	Scale 比例	
V. CHEN	As shown	
CAD FILE 電腦記錄	Drawing No. 圖號	
8-F-5a	8/F-5f	

**The Chinese University of Hong Kong
38EF - Engineering Building Complex, phase 2**

Breakdown of the estimates for consultants' fees

			Estimated man- months	Average MPS* salary point	Multiplier factor	Actual & Estimated fee (\$ million)
I.	Consultants' staff costs					
(a)	Assessment of tenders	Professional	0.7	38	2.4	0.10
(b)	Contract administration	Professional	4.0	38	2.4	0.55
		Technical	2.2	14	2.4	0.10
(c)	Site supervision	Professional	25.5	38	1.7	2.49
		Technical	32.5	14	1.7	1.05
					Sub-total	4.29
II.	Out-of-pocket expenses					
(a)	Lithography and other direct expenses					0.16
					Sub-total	0.16
III.	Scale fees					4.19
					Sub-total	4.19
					Total	8.64

* MPS = Master Pay Scale

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Notes

1. Regarding the staff employed in the consultants' offices, 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 at 1 April 2000, MPS point 38 is \$57,525 per month, and MPS point 14 is \$19,055 per month). A multiplier factor of 1.7 instead is applied in the case of contract staff employed by CUHK direct on the project.
2. 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.
3. The figures given above are based on estimates prepared by CUHK which have been examined and agreed by D Arch S.

Enclosure 3 to PWSC(2001-02)1

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

Project	Amount proposed by CUHK (in Sept 2000 prices) (\$ million)	Amount recommended by UGC (in Sept 2000 prices) (\$ million)	Amount of reduction (\$ million)
CUHK - Engineering Building Complex, phase 2	226.62	225.33	1.29

Note

The net reduction of \$1.29 million is the result of the following adjustments -

- (a) downward adjustment of the building cost (\$740,000);
- (b) downward adjustment of consultant's fees - project manager being in-house staff of CUHK is not supported (\$810,000);
- (c) upward adjustment of furniture & equipment item (\$350,000); and
- (d) corresponding downward adjustment of contingencies (\$90,000).