

ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

HEAD 708 – CAPITAL SUBVENTIONS AND MAJOR SYSTEMS AND EQUIPMENT

Universities

The Hong Kong University of Science and Technology

9EL – Enterprise Centre

Members are invited to recommend to Finance Committee the upgrading of **9EL** to Category A at an estimated cost of \$105.6 million in money-of-the-day prices for the construction of the Enterprise Centre in the Hong Kong University of Science and Technology.

PROBLEM

The Hong Kong University of Science and Technology (HKUST) needs additional accommodation and facilities to support activities relating to instruction, research and technology transfer.

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 **9EL** to Category A at an estimated cost of \$105.6 million in money-of-the-day (MOD) prices for the construction of HKUST's Enterprise Centre.

/PROJECT

PROJECT SCOPE AND NATURE

3. The Enterprise Centre is about 6 816 square metres (m²) in net operational floor area (NOFA). The size is determined having regard to the accommodation requirements of the proposed occupants and the need to have a critical mass of research and entrepreneurial ventures. The Enterprise Centre would be an extension of the existing Academic Complex, providing offices, lecture and seminar facilities, and generic dry and wet laboratories in a five-storey building. It comprises the following –

- (a) two suites of classrooms of 1 387 m² in NOFA for undergraduate and postgraduate instruction, professional development and training programmes;
- (b) 43 dry and wet laboratories of 4 506 m² in NOFA for applied research and development (R&D), particularly that conducted in collaboration with industrial partners, including projects approved under the Research Grants Council¹ and Innovation and Technology Fund²;
- (c) consolidated R&D units (Applied Technology Centre, Engineering Industrial Consortium, Office of Contract and Grant Administration and Technology Transfer Centre) of 500 m² in NOFA, which would provide one-stop-shop support for HKUST's research activities and technology transfer;
- (d) display/exhibition space of 350 m² in NOFA and support offices, including an Industrial Services Office, of 73 m² in NOFA;
- (e) provision of 17 carparking spaces; and
- (f) consequential works in Blocks A and B of the Academic Complex.

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¹ The Research Grants Council is a non-statutory advisory body responsible for advising the Government, through the UGC, on the needs of Hong Kong's higher education institutions in the field of academic research and for the distribution of funding for academic research projects undertaken by academic staff of UGC-funded institutions.

² The Innovation and Technology Fund is set up to support projects that contribute to innovation and technology upgrading in industry, as well as those that are essential to the upgrading and further development of industry.

————— A site plan is at Enclosure 1 and a computer rendered drawing of the building is at
————— Enclosure 2. HKUST plans to start construction works in April 2004 for completion in April 2006.

JUSTIFICATION

4. HKUST lacks space and facilities to conduct applied R&D, to test, develop, and market the results of research funded by public and private sources, and to provide effective services to the industrial sector of Hong Kong. The Enterprise Centre, housing activities associated with instruction, industrial R&D, transfer of technology and creation of research partnerships between the academic and business sectors, will support and facilitate these endeavours.

————— 5. The need for new space was partially addressed by Blocks A and B to the south end of the Academic Complex (see Enclosure 1). However, Blocks A and B merely provide space for the establishment of an Entrepreneurship Centre for the incubation of high-tech start-up companies, provision of some industrial R&D laboratories, and operation of professional development, training and management programs. The R&D Branch is constrained by the lack of accommodation to expand in the immediate future. The Enterprise Centre is therefore needed to enhance the ability of HKUST to meet its mission to foster economic development in Hong Kong.

6. According to a study on space and accommodation at UGC-funded institutions completed in 2002, HKUST has a 7.2% shortfall in accommodation provision equivalent to 7 970 m² in NOFA. The proposed development would provide an additional 6 816 m² in NOFA to meet the shortfall.

FINANCIAL IMPLICATIONS

7. The total estimated project cost of the Enterprise Centre is \$211.1 million in MOD prices. The Government will fund up to 50% of the estimated cost, with the remainder to be met by private donation. The project cost provided by the Government will be capped at \$105.6 million in MOD prices. HKUST will be responsible for all additional funding requirement, whether due to higher-than-expected tender outturn or other variations. The Government and HKUST will share all savings arising from a lower-than-expected tender outturn on a pro-rata basis of their estimated contribution to the project (i.e. 50% for the Government and 50% for HKUST).

8. SG, UGC, on the advice of D Arch S, recommends approval of the project at a cost of \$105.6 million in MOD prices (see paragraph 10 below), made up as follows –

	\$ million	
(a) Alteration works to Blocks A and B of the Academic Complex	11.8	
(b) Site formation and slope stabilisation	7.4	
(c) Building	72.3	
(d) Building services	50.4	
(e) Drainage and external works	12.2	
(f) Consultants' fees for –	6.8	
(i) Tender assessment	0.4	
(ii) Contract administration	3.0	
(iii) Site supervision	3.1	
(iv) Out-of-pocket expenses	0.3	
(g) Furniture and equipment ³	35.5	
(h) Contingencies	19.6	
Sub-total	216.0	(in September 2003 prices)
(i) Provision for price adjustment	(4.9)	
Sub-total	211.1	(in MOD prices)
(j) Less contribution by HKUST (i.e. 50% of the total estimated project cost)	(105.5)	
Total	105.6	(in MOD prices)
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³ Based on 12.5% of the building and building services costs of the project estimate and a list of specialist equipment required. Examples of the specialist equipment include clean room air filtration units, biohazard fume hoods and biosafety cabinets.

9. HKUST proposes to engage consultants to undertake tender assessment, contract administration and site supervision of the project. A detailed breakdown of the estimate for the consultants' fees by man-months is at Enclosure 3. The construction floor area (CFA) of the new building under this project is 11 215 m². The estimated construction unit cost, represented by the building and building services costs, is \$10,941 per m² of CFA in September 2003 prices. D Arch S considers the estimated construction unit cost reasonable and comparable with those of similar projects such as 43EF "A purpose-designed building for centralised science laboratories" of the Chinese University of Hong Kong (upgraded to Category A in April 2002), the estimated construction unit cost of which was \$11,922 per m² of CFA in September 2003 prices. A detailed account of the CFA vis-à-vis the construction unit cost of 9EL is at Enclosure 4.

10. Subject to approval, HKUST will phase the expenditure as follows –

Year	\$ million (Sept 2003)		Price adjustment factor	\$ million (MOD)	
	Total cashflow	Cashflow under 9EL		Total cashflow	Cashflow under 9EL
2004 – 05	42.4	–	0.98225	41.6	–
2005 – 06	154.8	89.4	0.97734	151.3	87.4
2006 – 07	9.8	9.8	0.97245	9.5	9.5
2007 – 08	9.0	9.0	0.96759	8.7	8.7
	<u>216.0</u>	<u>108.2</u>		<u>211.1</u>	<u>105.6</u>

11. We have derived the MOD estimates on the basis of the Government's latest forecast of trend labour and construction prices for the period 2004 to 2008. HKUST will deliver 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.

12. The project will have no impact on tuition fees. The additional recurrent costs will be absorbed by HKUST and the proposal has no additional recurrent implications on the Government.

PUBLIC CONSULTATION

13. Public consultation is not necessary as the Enterprise Centre is within the campus of HKUST.

ENVIRONMENTAL IMPLICATIONS

14. The proposed project constitutes a planned extension of development already undertaken in the immediate area with no long term environmental impact. The Enterprise Centre is to be constructed on platforms formed under previous construction contracts which have been temporarily hydro-seeded but otherwise are devoid of vegetation.

15. During construction, HKUST 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.

16. At the planning and design stages, HKUST has considered measures to reduce the generation of construction and demolition (C&D) materials. HKUST will use suitable excavated materials for filling within the site to minimise off-site disposal. To further minimise the generation of C&D materials, HKUST will encourage the contractor to use non-timber formwork and recyclable materials for temporary works. In addition, HKUST will require the contractor to use metal site hoardings and signboards so that these materials can be recycled or reused in other projects.

17. HKUST 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. HKUST will ensure that the day-to-day operations on site comply with the approved WMP. HKUST will control the disposal of public fill and C&D waste to designated public filling facilities and landfills respectively through a trip ticket system. HKUST will require the contractor to separate public fill from C&D waste for disposal at appropriate facilities. HKUST will record the disposal, reuse and recycling of C&D materials for monitoring purposes. HKUST estimates that the project will

/generate

generate about 13 000 cubic metres (m³) of C&D materials. Of these, HKUST will reuse about 3 250 m³ (25%) on site, 7 800 m³ (60%) as fill in public filling areas⁴, and dispose of 1 950 m³ (15%) at landfills. The notional cost of accommodating C&D waste at landfills is estimated to be \$243,750 for this project (based on a notional unit cost⁵ of \$125/m³).

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 supported proposals to the Government. Having examined HKUST's proposal, SG, UGC has, in consultation with D Arch S, adjusted the project estimate proposed by HKUST to arrive at the project estimate set out in paragraph 8 above. A comparison of the project estimate proposed by HKUST and the revised estimate recommended by the UGC and agreed by HKUST, is at Enclosure 5.

20. We upgraded **9EL** to Category B in August 2001. HKUST engaged consultants to carry out a topographical survey and site investigation in October 2001 and to prepare detailed design and tender documents in April 2003 at a total cost of \$8.4 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 topographical survey, site investigation and detailed design of the project. They are finalising the tender documents.

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⁴ 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.

⁵ 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/m³, 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.

21. The proposed construction works will not involve any tree removal proposal.

22. HKUST estimates that the project will create some 150 jobs comprising 15 professional/technical staff and 135 labourers, totalling 3 400 man-months.

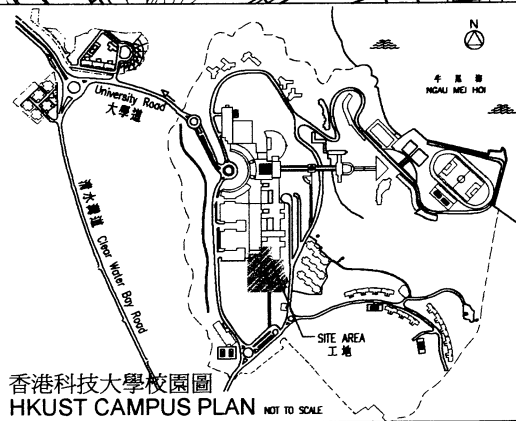
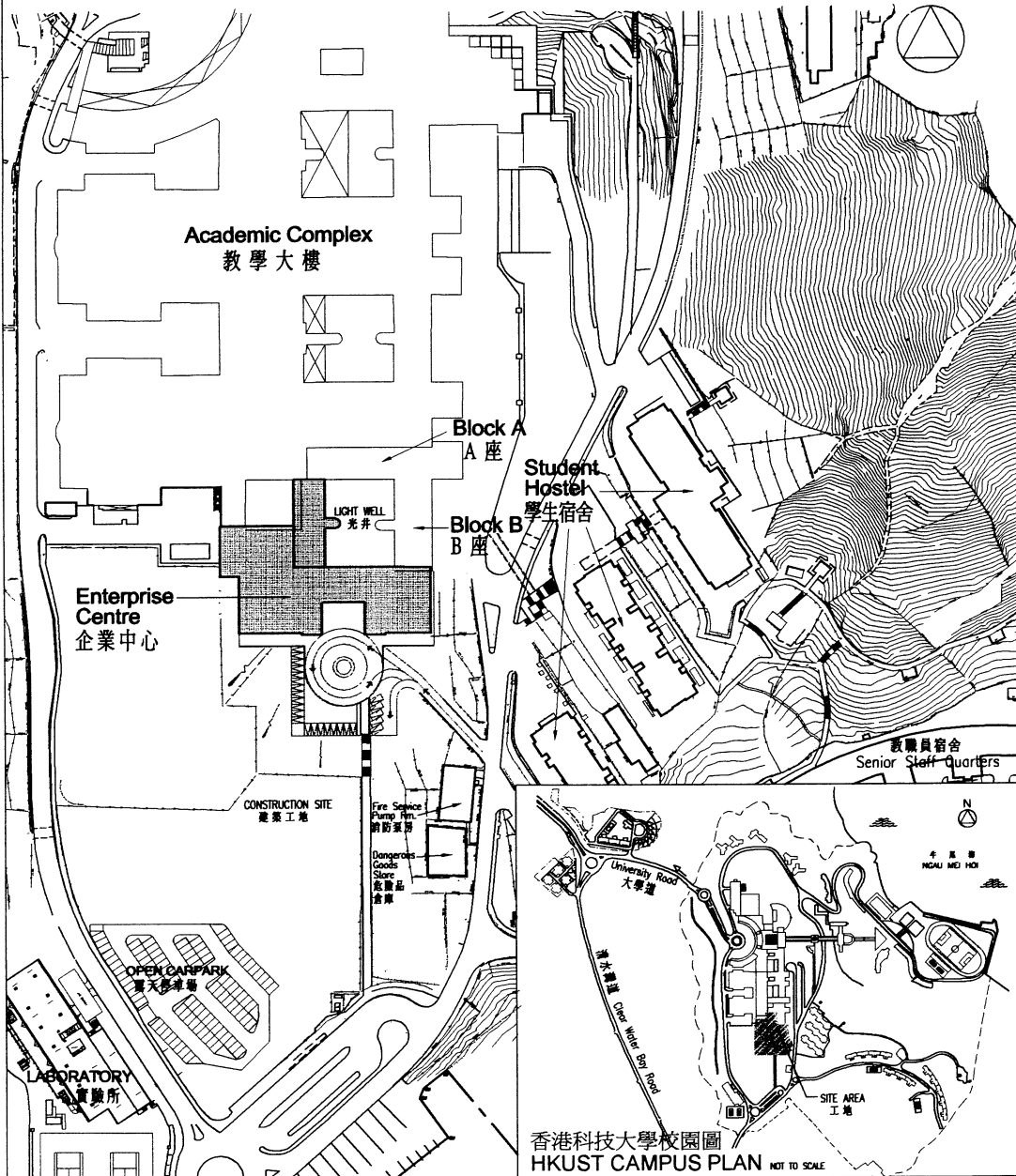
Education and Manpower Bureau
January 2004

Layout Plan 總平面圖

比例尺 SCALE 1:2000

Enclosure 1 附件1

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DRAWING TITLE 圖標

9EL - Enterprise Centre
企業中心

REV.	內容編纂 DESCRIPTION	日期 DATE
DEPT. 部門	EMO	SCALE 比例 1:2000
DRAWN BY 繪圖	CHECKED BY 核對	
CAD FILE NO. 檔案	DATE 日期	27 OCT. 03
DRAWING NO. 圖號		



THE HONG KONG
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香港科技大學



電腦繪製的企業中心模擬圖(東南面)

Computer rendered drawing of Enterprise Centre (South-East View)

DRAWING TITLE 圖標

9EL-Enterprise Centre
企業中心

設計 DESIGN	校對 CHECKED	日期 DATE
DEPT. 部門	DESCRIPTION	SCALE 比例
EMO		
DRAWN BY 繪圖	CHECKED BY 校對	
CAD FILE NO. 檔案	DATE 日期	27 DEC 03
DRAWING NO. 圖號		



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Enclosure 3 to PWSC(2003-04)59

The Hong Kong University of Science and Technology 9EL – Enterprise Centre

Breakdown of the estimate for consultants' fees^(Note 1)

		Estimated man- months	Average MPS* salary point	Multiplier (Note 2)	Estimated fee (\$ million)
(a) Consultants' staff costs ^(Note 3)					
(i) Tender assessment	Professional	–	–	–	0.3
	Technical	–	–	–	0.1
(ii) Contract administration	Professional	–	–	–	2.1
	Technical	–	–	–	0.9
Sub-total					3.4
(b) Site supervision ^(Note 4)					
	Professional	19.0	38	1.6	1.7
	Technical	47.0	14	1.6	1.4
Sub-total					3.1
(c) Out-of-pocket expenses ^(Note 5)					
Lithography and other direct expenses					0.3
Sub-total					0.3
Total					6.8

* MPS = Master Pay Scale

Notes

- Having examined the consultants' fees estimated by HKUST, the Director of Architectural Services considers the figures acceptable.
- A multiplier of 1.6 is applied in respect of site supervision staff to be employed direct by HKUST. (As at 1 January 2004, MPS point 38 = \$55,993 per month, and MPS point 14 = \$18,603 per month.)

3. The consultants' staff cost for tender assessment and contract administration is calculated in accordance with the existing consultancy agreements for the design and construction of **9EL**. The assignment will only be executed subject to Finance Committee's approval to upgrade **9EL** to Category A.
4. We will only know the actual man-months and actual costs for site supervision after completion of the construction works.
5. 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 Hong Kong University of Science and Technology
9EL – Enterprise Centre

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

(a) Breakdown of CFA

	Estimated floor area (m²)
Net operational floor area (NOFA)	6 816
Circulation areas and toilets	3 678
Mechanical and electrical plants	721
CFA	<u>11 215</u>

(b) NOFA/CFA ratio⁶ 61%

(c) Estimated construction unit cost (represented by the building and building services costs) \$10,941 per m² of CFA (in September 2003 prices)

⁶ The NOFA/CFA ratio is 56% for **25EK** “Phase 7 development” of the Hong Kong Polytechnic University upgraded to Category A in July 2002 and 47% for **43EF** “A purpose-designed building for centralised science laboratories” of the Chinese University of Hong Kong upgraded to Category A in April 2002.

**The Hong Kong University of Science and Technology
9EL – Enterprise Centre**

**A comparison of the project estimate⁷ proposed by HKUST
with the estimate recommended by UGC**

\$ million (in September 2003 prices)			
Project	Amount proposed by HKUST	Amount recommended by UGC	Amount of reduction
HKUST – Enterprise Centre	220.4	216.0	4.4

Notes

The net reduction of \$4.4 million results from trimming the estimate on –

- (a) site supervision cost by \$900,000; and
- (b) contingencies by \$3.5 million.