

For discussion
on 20 December 2007

PWSC(2007-08)66

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 11EL – Extension to the existing Academic Building

Members are invited to recommend to Finance Committee the upgrading of **11EL** to Category A at an estimated cost of \$90.8 million in money-of-the-day prices for the development of an extension to the existing Academic Building of The Hong Kong University of Science and Technology within its campus in Clear Water Bay.

PROBLEM

The Hong Kong University of Science and Technology (HKUST) needs additional space and facilities to support the implementation of the normative four-year undergraduate programme under the new academic structure for senior secondary education and higher education (i.e. the “3+3+4”).

/PROPOSAL

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, proposes to upgrade **11EL** to Category A at an estimated cost of \$90.8 million in money-of-the-day (MOD) prices for the development of an extension to the existing Academic Building of HKUST.

PROJECT SCOPE AND NATURE

3. The scope of **11EL** comprises the construction of a five-storey extension block of a total of about 3 000 square metres (m²) in net operational floor area (NOFA) adjoining the HKUST's existing Academic Building. The extension block will accommodate the following facilities —

- (a) six open laboratories and support space of about 600 m² in NOFA;
- (b) library facilities of about 600 m² in NOFA;
- (c) classroom facilities and study space of about 800 m² in NOFA;
- (d) office facilities of about 400 m² in NOFA; and
- (e) student/staff amenities of about 600 m² in NOFA.

4. A site plan is at Enclosure 1. A list of the facilities, the sectional plan and an artist's impression of the extension building are at Enclosures 2 to 4 respectively. HKUST plans to start construction works in the second quarter of 2008 for completion in the second quarter of 2010.

JUSTIFICATION

5. The new academic structure for senior secondary education and higher education will be implemented starting from the 2009/10 academic year. The first cohort of senior secondary students will undergo a four-year

/undergraduate

undergraduate programme starting from the 2012/13 academic year. The UGC-funded institutions, including HKUST, need to expand their campus space and facilities in order to accommodate the additional students under the new four-year undergraduate programme and to provide a suitable teaching and learning environment in support of the new academic structure.

6. HKUST plans to carry out two capital works projects¹ to provide additional space and facilities of some 15 500 m² in NOFA within its campus for implementation of “3+3+4”, one of which is to construct an extension to its existing Academic Building of some 3 000 m² in NOFA under **11EL** to create additional teaching and learning facilities. The project involves expansion of each of the five levels of the Academic Building so that additional facilities such as open laboratories, classrooms, study space, library facilities, offices and student/staff amenities can be provided. The proposed extension will also facilitate self-study and co-operative learning by providing space and facilities in the study area within the University Library. HKUST also plans to redistribute its library services to facilitate the creation of student-based learning centres. The proposed extension to the HKUST Academic Building will provide an infrastructure nurturing a multiple and mixed environment for whole-person education and self-study learning.

FINANCIAL IMPLICATIONS

7. SG, UGC, on the advice of D Arch S, estimates the capital cost of the project to be \$90.8 million in MOD prices (see paragraph 10 below), made up as follows –

	\$ million
(a) Site development including piling and interfacing works	4.0
(b) Building	42.5
(c) Building services	21.2
	/(d)

¹ The other “3+3+4” capital works project is the construction of a new Academic Building. HKUST is working on the project details and intends to submit the funding proposal within the current legislative session.

		\$ million
(d)	Drainage and external works	4.4
(e)	Consultants' fees for	3.0
	(i) Tender assessment	0.2
	(ii) Contract administration	1.1
	(iii) Site supervision	1.7
(f)	Furniture and equipment ²	8.0
(g)	Contingencies	6.2

	Sub-total	89.3 (in September 2007 prices)
(h)	Provision for price adjustment	1.5

	Total	90.8 (in MOD prices)

8. HKUST will 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.

9. The construction floor area (CFA) of this project is 5 400 m². The estimated construction unit cost, represented by the building and building services costs, is \$11,796 per m² of CFA in September 2007 prices. A detailed account of the CFA vis-à-vis the construction unit cost of **11EL** is at Enclosure 6. D Arch S considers the estimated construction unit cost reasonable and comparable to those of similar projects for UGC-funded institutions such as **46EF** "Teaching complex at western campus" of the Chinese University of Hong Kong (with an estimated construction unit cost of \$12,330 per m² of CFA in September 2007 prices).

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² Based on 12.5% of the building and building services costs of the project estimate.

10. Subject to approval, HKUST will phase the expenditure as follow -

Year	\$ million (Sept 2007)	Price adjustment factor	\$ million (MOD)
2008 - 09	27.5	1.00750	27.7
2009 - 10	46.6	1.01758	47.4
2010 - 11	10.4	1.02775	10.7
2011 - 12	4.8	1.03803	5.0
	89.3		90.8

11. We have derived the MOD estimates on the basis of the Government's latest forecast of trend rate of change in the prices of public sector buildings and construction output for the period 2008 to 2012. HKUST will tender the works through a fixed-price lump-sum contract as it can clearly define the scope of works in advance.

12. The project has no impact on tuition fees. The additional recurrent costs associated with this project will be funded by HKUST. The proposal has no additional recurrent implication on the Government.

PUBLIC CONSULTATION

13. The project is an extension to an existing academic building located within the HKUST campus. There are no residential developments nearby, and the project will not affect residents in the vicinity. HKUST has consulted its staff and students who have expressed support to the project. We circulated an information paper on this project to the Legislative Council Panel on Education on 6 December 2007. Members did not raise any objection to the proposal.

/ENVIRONMENTAL

ENVIRONMENTAL IMPLICATIONS

14. This is not a designated project under the Environmental Impact Assessment Ordinance (Cap. 499). The project will not cause long term environmental impact. HKUST has included in the project estimates the cost to implement suitable mitigation measures to control short term environmental impacts.

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 contract. 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. HKUST has taken into account the topography of the site (e.g. move the new building away from slope edge so that slope stabilization work can be kept to the absolute minimum) in the planning and design stages to reduce the generation of construction waste where possible. In addition, HKUST will require the contractor to reuse inert construction waste (e.g. use suitable excavated materials for filling within the site and use metal site hoardings and signboards so that these materials can be recycled or reused in other projects) on site or in other suitable construction sites as far as possible, in order to minimize the disposal of inert construction waste to public fill reception facilities³. HKUST will encourage the contractor to maximize the use of recycled or recyclable inert construction waste, as well as the use of non-timber formwork to further minimize the generation of construction waste.

17. HKUST will also require the contractor to submit for approval a plan setting out the waste management measures which will include appropriate mitigation means to avoid, reduce, reuse and recycle inert construction waste. HKUST will ensure that the day-to-day operations on site comply with the approved plan. HKUST will require the contractor to separate the inert portion from non-inert construction waste on site for disposal at appropriate facilities. HKUST will control the disposal of inert construction waste and non-inert construction waste to public fill reception facilities and landfills respectively through a trip-ticket system.

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³ Public fill reception facilities are specified in Schedule 4 of the Waste Disposal (Charges for Disposal of Construction Waste) Regulation. Disposal of inert construction waste in public fill reception facilities requires a licence issued by the Director of Civil Engineering and Development.

18. HKUST estimates that the project will generate in total about 1 819 tonnes of construction waste. Of these, HKUST will reuse about 221 tonnes (12.2%) of inert construction waste on site, deliver 1 430 tonnes (78.6%) of inert construction waste to public fill reception facilities for subsequent reuse. In addition, HKUST will dispose of 168 tonnes (9.2%) of non-inert construction waste at landfills. The total cost of accommodating construction waste at public fill reception facilities and landfill sites is estimated to be \$59,610 for this project (based on a unit cost of \$27/tonne for disposal at public fill reception facilities and \$125/tonne⁴ at landfills).

HERITAGE IMPLICATIONS

19. This project will not affect any heritage site, i.e. all declared monuments, graded historic buildings and sites of archaeological interests.

LAND ACQUISITION

20. The project does not require any 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, and refers those supported proposals to the Government for consideration of bidding of funds under the established mechanism. 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 7 above.

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⁴ 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 is likely to be more expensive) when the existing ones are filled.

22. We upgraded **11EL** to Category B in April 2006. HKUST engaged consultants to carry out topographical survey, site investigation, preliminary design, detailed design and to prepare tender documents at a total cost of \$3.1 million. We charged this amount to block allocation **Subhead 8100EX** “Alterations, additions, repairs and improvements to the campuses of UGC-funded institutions”. The consultants have completed the topographical survey, site investigation, preliminary design and detailed design of the project. HKUST is finalising the tender documents for this project.

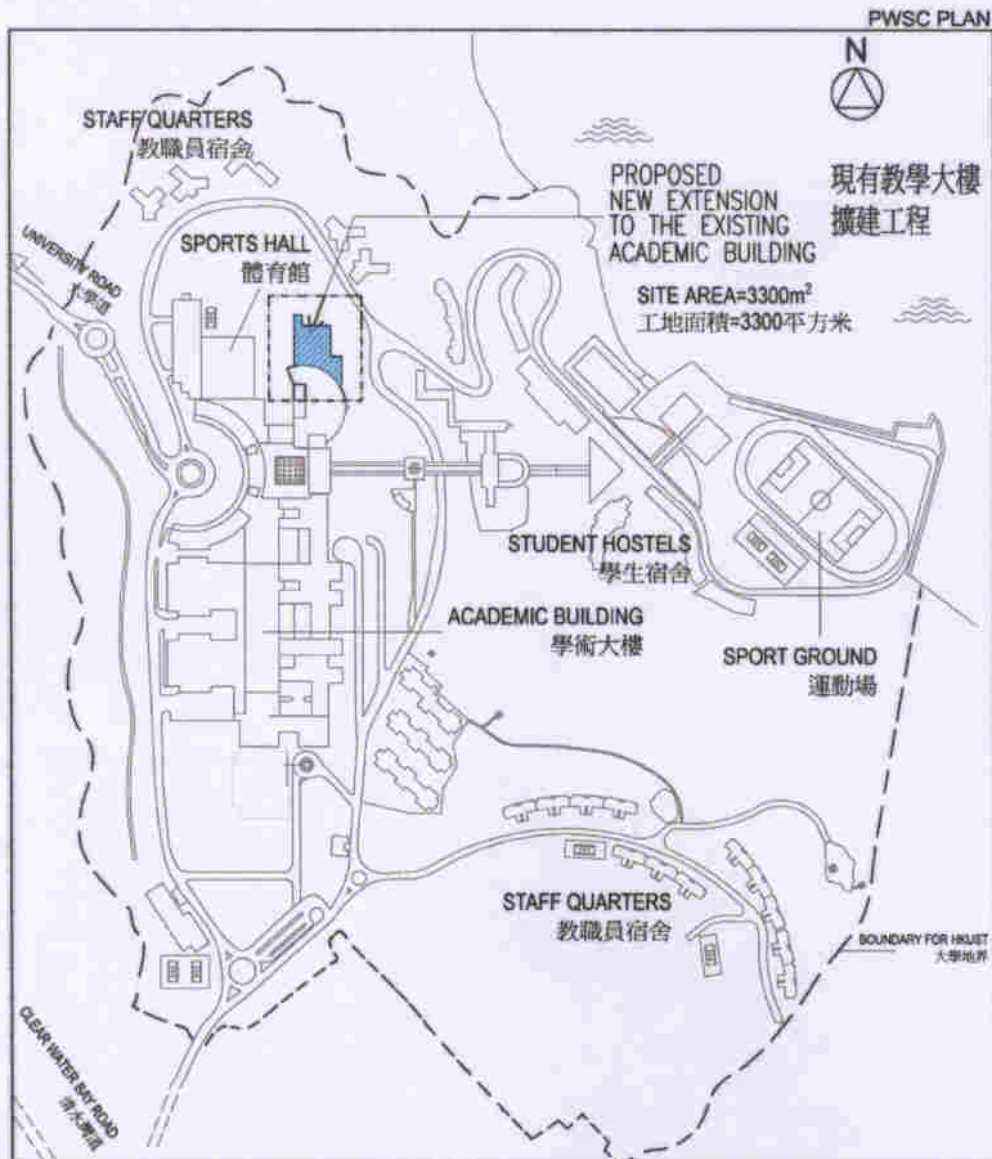
23. The proposed construction works will not involve any tree removal and tree planting proposal.

24. HKUST estimates that the proposed works will create about 73 jobs (65 for labourers and another 8 for professional/technical staff), providing a total employment of 1 500 man-months.

Education Bureau
December 2007

The Hong Kong University of Science and Technology
 11EL – Extension to the existing Academic Building
 香港科技大學
 11EL – 現有教學大樓擴建工程

Site Plan 工地平面圖



香港科技大學校園圖
 HKUST CAMPUS PLAN NOT TO SCALE

PROPOSED NEW EXTENSION
 TO THE EXISTING
 ACADEMIC BUILDING

REV.	DESCRIPTION	SCALE	DATE
EMO			
DC			
			AUG. 07
			UST-LAND7-P1a



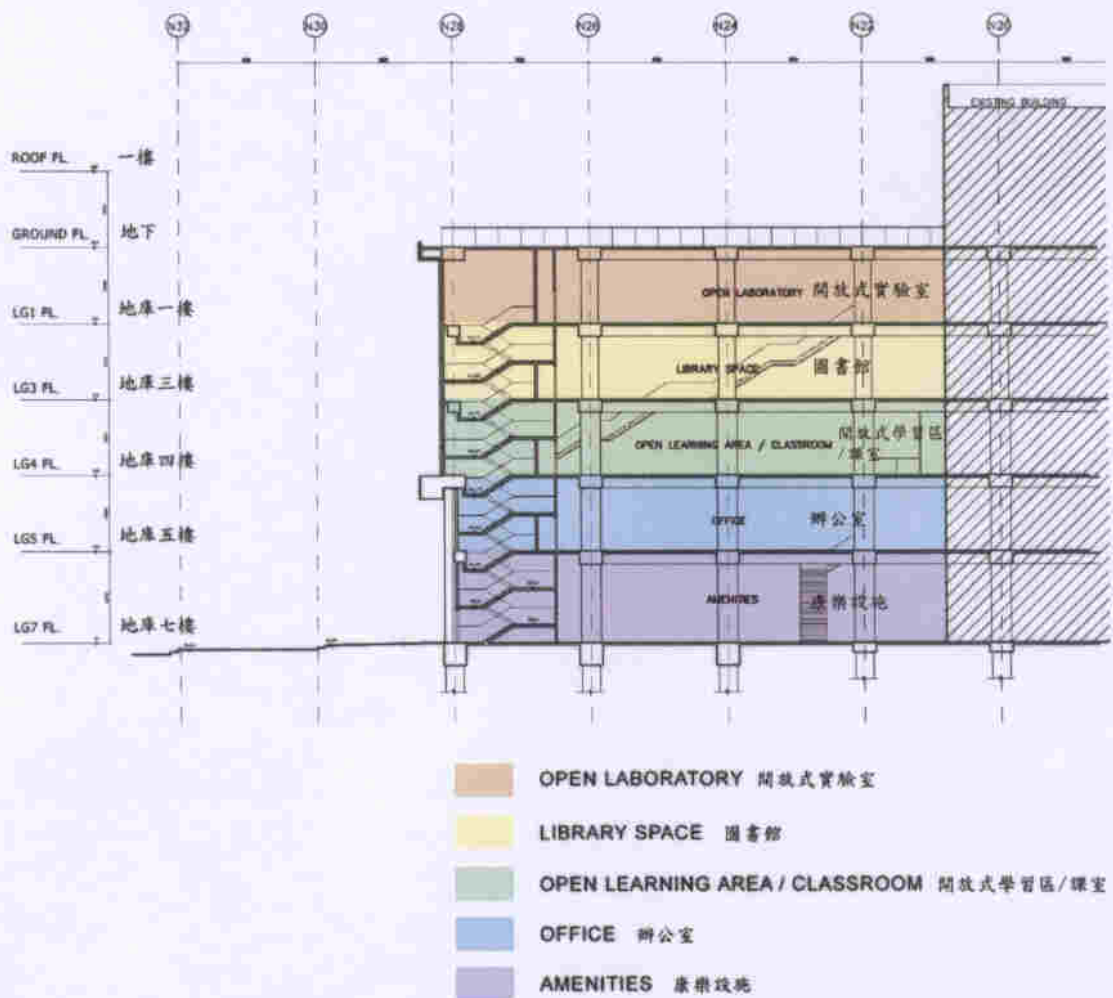
**The Hong Kong University of Science and Technology
11EL - Extension to the existing Academic Building**

List of facilities

Facilities	Estimated floor area in net operational floor area (NOFA) (m²)
(a) Open laboratories	600
(b) Library facilities	600
- individual/group study area	
- general use computing area	
(c) Classroom facilities and study space	800
- 150 m ² classroom	
- 650 m ² open learning area	
(d) Office facilities	400
(e) Student/staff amenities	600
- exhibition space, food facilities, lounges, recreation facilities and meeting rooms	
Total	<hr/> 3 000 <hr/>

The Hong Kong University of Science and Technology
 11EL – Extension to the existing Academic Building
 香港科技大學
 11EL – 現有教學大樓擴建工程

Sectional Plan 截面圖



The Hong Kong University of Science and Technology
11EL – Extension to the existing Academic Building
香港科技大學
11EL – 現有教學大樓擴建工程

View of the building (artist's impression) 外觀構思圖



Enclosure 5 to PWSC(2007-08)66

**The Hong Kong University of Science and Technology
11EL - Extension to the existing Academic Building**

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

		Estimated man- months	Average MPS* salary point	Multiplier (Note 2)	Estimated fees (\$ million)
(a) Consultants' staff costs ^(Note 3)					
(i) Tender assessment	Professional	–	–	–	0.1
	Technical	–	–	–	0.1
(ii) Contract administration	Professional	–	–	–	0.8
	Technical	–	–	–	0.3
(b) Site supervision ^(Note 4)	Professional	13.0	38	1.6	1.2
	Technical	16.5	14	1.6	0.5
Total					3.0

* MPS = Master Pay Scale

Notes

1. Having examined the consultants' fees estimated by HKUST, the Director of Architectural Services considers the figures acceptable.
2. A multiplier of 1.6 is applied to the average MPS point to estimate the cost of site supervision staff to be employed direct by HKUST. (As at 1 April 2007, MPS point 38 = \$56,945 per month, and MPS point 14 = \$18,840 per month.)
3. The consultants' staff costs for tender assessment and contract administration are calculated in accordance with the existing consultancy agreements for the design and construction of **11EL**. The assignment will only be executed subject to Finance Committee's approval to upgrade **11EL** to Category A.
4. We will only know the actual man-months and actual costs for site supervision after completion of the construction works.

Enclosure 6 to PWSC(2007-08)66

**The Hong Kong University of Science and Technology
11EL - Extension to the existing Academic Building**

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)	3 000
	Circulation areas and toilets	1 915
	Mechanical and electrical plants	<u>485</u>
	CFA	<u>5 400</u>
(b)	NOFA / CFA ratio	55%
(c)	Estimated construction unit cost (represented by the building and building services costs)	\$ 11,796 per m ² of CFA (in September 2007 prices)