

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

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

#### **Universities**

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

#### **50EF – Extension to the existing University Library at Central Campus**

Members are invited to recommend to Finance Committee the upgrading of **50EF** to Category A at an estimated cost of \$251.7 million in money-of-the-day prices for the construction of an extension to the existing University Library by The Chinese University of Hong Kong within its campus in Sha Tin.

### **PROBLEM**

The Chinese University of Hong Kong (CUHK) 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” academic structure).

### **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 **50EF** to Category A at an estimated cost of \$251.7 million in money-of-the-day (MOD) prices for the construction of an extension to the existing University Library at Central Campus by CUHK.

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## PROJECT SCOPE AND NATURE

3. The scope of **50EF** comprises the construction of a six-storey building (including a single-storey basement) providing some 6 170 square metres (m<sup>2</sup>) in net operational floor area (NOFA). The building will accommodate the following facilities -

- (a) reading and study space of some 4 520 m<sup>2</sup> in NOFA;
- (b) stack space of some 880 m<sup>2</sup> in NOFA;
- (c) support/service space of some 450 m<sup>2</sup> in NOFA;
- (d) office facilities of some 320 m<sup>2</sup> in NOFA; and
- (e) 34 covered car parking spaces.

4. The site plans are at Enclosure 1. The view of the building (artist's impression), sectional plan and list of facilities are at Enclosures 2 to 4 respectively. CUHK plans to commence the construction works in the fourth quarter of 2009 for completion in the fourth quarter of 2011.

## JUSTIFICATION

5. The "3+3+4" academic structure will be implemented starting from the 2009/10 academic year. The first cohort of senior secondary students will undergo a four-year undergraduate programme starting from the 2012/13 academic year. The UGC-funded institutions, including CUHK, 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. CUHK will carry out four capital works projects<sup>1</sup> to provide additional space and facilities of some 24 500 m<sup>2</sup> in NOFA in total to support the implementation of "3+3+4" academic structure, one of which is to construct an

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<sup>1</sup> The other "3+3+4" capital works projects of CUHK are "Student amenity centre" (4 120 m<sup>2</sup>) and "Centralized general research laboratory complex (block 1) in Area 39" (9 860 m<sup>2</sup>) which were approved by the Finance Committee in January and April 2009 respectively, and "An integrated teaching building" (some 4 300 m<sup>2</sup>) which is tentatively scheduled for submission to the Legislative Council later this year.

extension to the existing University Library at Central Campus. Among the existing libraries in CUHK, the University Library at Central Campus is the most heavily used. In consideration of the demand for its services, its strategic location and convenience to users, CUHK proposes to construct an extension to the University Library and the adjoining Tin Ka Ping Building at the Central Campus.

7. The project will provide additional space to meet the need for more library space arising from the increase in number of students, and to provide facilities in tandem with the modern trend of learning. CUHK also plans to take this opportunity to establish an integrated learning environment conducive to interaction, whole-person education and self-study learning. Apart from traditional library facilities such as reading desks and resources units, there will be 24-hour learning commons with group study rooms and group presentation rooms to facilitate self-study, project work and co-operative learning. Upon completion of the proposed extension, CUHK also plans to carry out spatial reorganisation at the existing University Library to rationalise its layout and improve the learning environment.

8. The project will provide a total of 34 covered car parking spaces to compensate for the existing open car parking spaces that will be lost as a result of the construction of the extension.

## FINANCIAL IMPLICATIONS

9. SG, UGC, on the advice of D Arch S, recommends approval of the project at a cost of \$251.7 million in MOD prices (see paragraph 12 below), made up as follows –

	<b>\$ million</b>
(a) Site formation and development	33.2
(b) Building	97.7
(c) Building services	49.4
(d) Drainage and external works	13.1
(e) Additional energy conservation measures	2.8
(f) Furniture and equipment	16.1

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		\$ million	
(g)	Consultants' fees for contract administration	3.6	
(h)	Remuneration of resident site staff	2.5	
(i)	Contingencies	16.4	
	Sub-total	<u>234.8<sup>2</sup></u>	(in September 2008 prices)
(j)	Provision for price adjustment	16.9	
	Total	<u>251.7</u>	(in MOD prices)

10. CUHK will engage consultants to undertake contract administration and resident site staff to supervise the works. A detailed breakdown of the estimates for the consultants' fees and resident site staff costs by man-months is at Enclosure 5.

11. The construction floor area (CFA) of this project is 10 637 m<sup>2</sup>. The estimated construction unit cost, represented by the building and building services costs, is \$13,829 per m<sup>2</sup> of CFA in September 2008 prices. A detailed account of the CFA vis-à-vis the construction unit cost is at Enclosure 6. The unit construction cost is relatively economical compared to other academic buildings due to less demanding requirements for building services, internal partitioning and finishes for the large open plan for library as well as the covered carpark. Reduced foundation requirements, as the building will be sitting on rock, also contribute to a more economical construction cost. In view of the nature of the building and the above factors, D Arch S considers the estimated construction unit cost reasonable, having regard to the current economic situation and prevailing construction prices. Discounting the above factors, the estimated construction unit cost is considered comparable to those of similar projects such as **54EF** "Two integrated teaching buildings" of The Chinese University of Hong Kong (with an estimated construction unit cost of \$16,004 per m<sup>2</sup> of CFA in September 2008 prices).

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<sup>2</sup> This represents an increase of 45.3% over the original estimated cost of \$161.6 million in September 2004 prices.

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

<b>Year</b>	<b>\$ million (Sept 2008)</b>	<b>Price adjustment factor</b>	<b>\$ million (MOD)</b>
2009 - 10	7.7	1.03500	8.0
2010 - 11	54.4	1.05570	57.4
2011 - 12	160.9	1.07681	173.3
2012 - 13	11.8	1.09835	13.0
	<u>234.8</u>		<u>251.7</u>

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 2009 to 2013. CUHK will tender the works through lump-sum contracts because it can clearly define the scope of works in advance. The contracts will provide for price adjustment to reflect market fluctuations in labour and material costs.

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

## **PUBLIC CONSULTATION**

15. As the project is located within the CUHK campus and there is no residential development in its immediate vicinity, the project will not affect residents nearby. CUHK has briefed and consulted its staff and students on the project on various occasions, including student assemblies, engagement meetings and fora on the Campus Master Plan. In response to the concerns of some staff members and students about the in-situ preservation of the Beacon and protection of house swifts nesting on the façades of the existing University Library, CUHK has adjusted the basement footprint and will provide new nests at the other side of the University Library for house swifts to migrate before commencement of works. CUHK has not received any objection to the latest design.

16. We submitted a paper on the project to the Legislative Council Panel on Education for discussion on 11 May 2009. The Panel supported the project and requested CUHK to provide supplementary information on the design of the extension and environmental and energy savings measures. The Administration relayed the supplementary information provided by CUHK to Members on 25 May 2009.

## ENVIRONMENTAL IMPLICATIONS

17. The project is not a designated project under the Environmental Impact Assessment Ordinance (Cap. 499). CUHK completed a Preliminary Environmental Review (PER) for the project in December 2005. The Director of Environmental Protection (DEP) agreed that with proper building orientation and layout design, the project would not have long-term environmental impact. CUHK has addressed these matters in the design of the project to the satisfaction of DEP.

18. CUHK has included in the project estimates the provisions required to implement suitable mitigation measures to control short-term environmental impacts. 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 contract. These include the use of silencers, mufflers, acoustic linings or shields for noisy construction activities, frequent cleaning and watering of the site, and the provision of wheel-washing facilities.

19. CUHK has considered measures (e.g. adjusting the building layout and foundation system to cope with the topography) in the planning and design stages to reduce the generation of construction waste where possible. In addition, CUHK will require the contractor to reuse inert construction waste (e.g. use excavated materials for filling) on site or in other suitable construction sites as far as possible, in order to minimise the disposal of inert construction waste to public fill reception facilities<sup>3</sup>. CUHK 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.

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<sup>3</sup> 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.

20. CUHK 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. CUHK will ensure that the day-to-day operations on site comply with the approved plan. CUHK will require the contractor to separate the inert portion from non-inert construction waste on site for disposal at appropriate facilities. CUHK 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.

21. CUHK estimates that the project will generate in total about 38 000 tonnes of construction waste. Of these, CUHK will reuse about 7 220 tonnes (19.0%) of inert construction waste on site and 17 480 tonnes (46.0%) of inert construction waste on other construction sites, and deliver 9 500 tonnes (25.0%) of inert construction waste to public fills reception facilities for subsequent reuse. In addition, CUHK will dispose of 3 800 tonnes (10.0%) of non-inert construction waste at landfills. The total cost for accommodating construction waste at public fill reception facilities and landfill sites is estimated to be \$731,500 for this project (based on a unit cost of \$27/tonne for disposal at public fill reception facilities and \$125/tonne<sup>4</sup> at landfills).

## ENERGY CONSERVATION MEASURES

22. This project will adopt various forms of energy efficient features including –

- (a) water cooled chillers;
- (b) heat wheels for heat energy reclaim of exhaust air;
- (c) automatic demand control of supply air;
- (d) automatic demand control of chilled water circulation system;
- (e) automatic demand control for ventilation fans in car park;

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<sup>4</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 is likely to be more expensive) when the existing ones are filled.

- (f) T5 energy efficient fluorescent tubes and compact fluorescent tubes with electronic ballast and occupancy and daylight sensors for lighting control;
- (g) light-emitting diode (LED) type exit signs;
- (h) automatic on/off switching of lighting and ventilation fan inside the lifts; and
- (i) heat pump for space heating and dehumidification.

23. For renewable energy technologies, CUHK will adopt solar park lighting in the landscape area.

24. For greening features, CUHK will adopt greening at rooftops.

25. For recycled features, CUHK will adopt condensate water recycling system for air-conditioning make-up purpose.

26. The total estimated additional cost for adoption of the above features is around \$2.8 million (including \$1.9 million for energy efficient features), which has been included in the cost estimate of the project. The energy efficient features will achieve 9.8% energy savings in the annual energy consumption with a payback period at about 5.8 years.

## **HERITAGE IMPLICATIONS**

27. This project will not affect any heritage site, i.e. all declared monuments, proposed monuments, graded historic sites/buildings, sites of archaeological interest and Government historic sites identified by the Antiquities and Monuments Office.

## **LAND ACQUISITION**

28. The project does not require any land acquisition.

**/BACKGROUND .....**



**BACKGROUND INFORMATION**

29. 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 DArchS 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 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 9 above.

30. We upgraded **50EF** to Category B in May 2006. CUHK engaged consultants in September 2008 to carry out site investigation, and to prepare preliminary design, detailed design and tender documents at a total estimated cost of \$7.4 million. We have 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 site investigation, preliminary design and detailed design of the project. CUHK is finalising the tender documents for the project.

31. The project will involve the removal of one tree and transplanting of seven trees within the campus. The tree to be removed is not an important tree<sup>5</sup>. CUHK will incorporate a planting proposal, which will include an estimated quantity of four trees, as part of the project.

32. CUHK estimates that the project will create about 145 jobs (130 for labourers and another 15 for professional/technical staff) providing a total employment of 3 150 man-months.

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Education Bureau  
May 2009

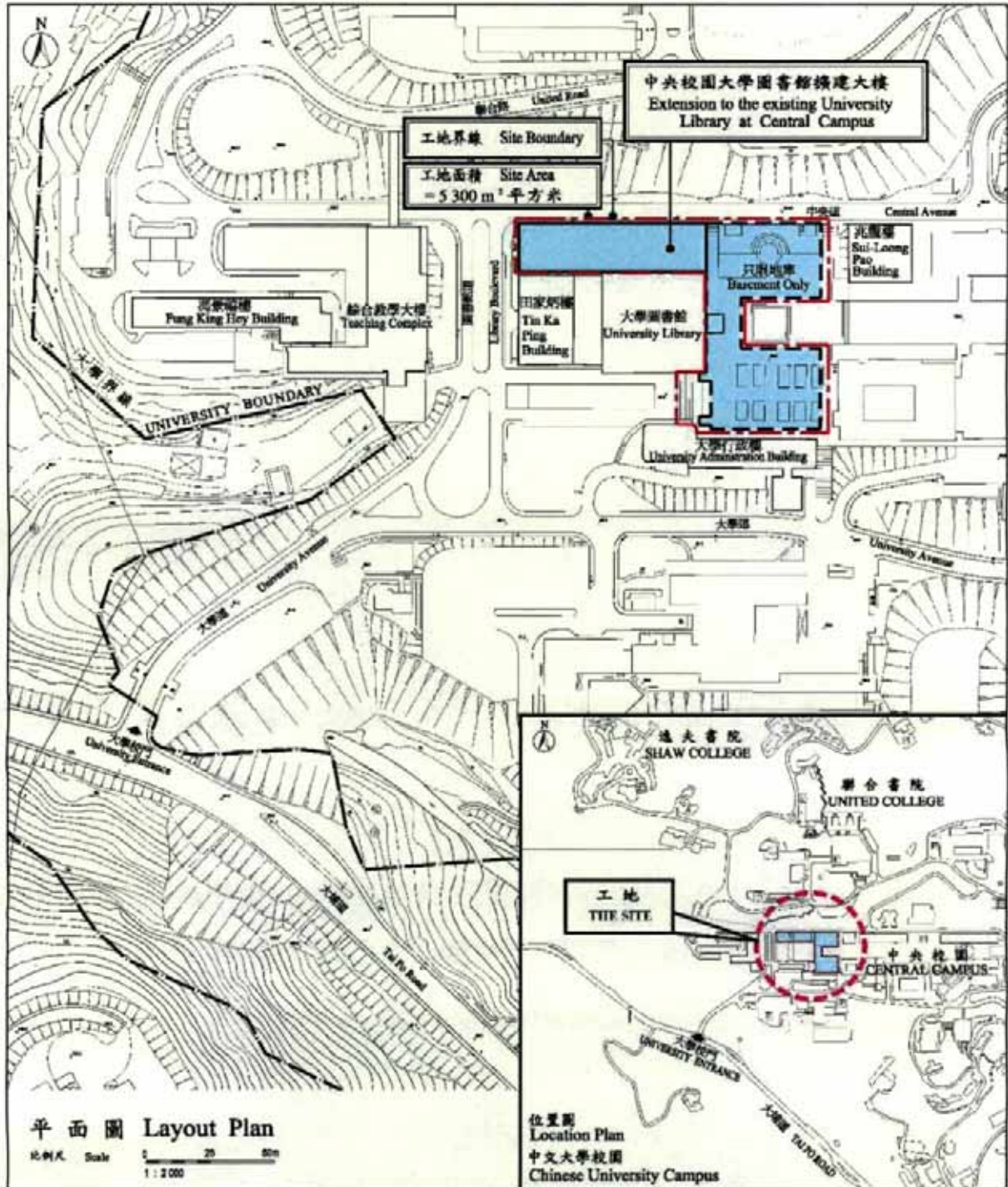
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<sup>5</sup> An "important tree" refers to trees in the Register of Old and Valuable Trees, or any other trees that meet one or more of the following criteria –

- (a) trees of 100 years old or above;
- (b) trees of cultural, historical or memorable significance e.g. Fung Shui tree, tree as landmark of monastery of heritage monument, and trees in memory of an important person or event;
- (c) trees of precious or rare species;
- (d) trees of outstanding form (taking account of overall tree sizes, shape and any special features) e.g. trees with curtain like aerial roots, trees growing in unusual habitat; or
- (e) trees with trunk diameter equal or exceeding 1.0 m (measured at 1.3 m above ground level) or with height / canopy spread equal or exceeding 25 m.

The Chinese University of Hong Kong  
50EF – Extension to the existing University Library at Central Campus  
香港中文大學  
50EF-中央校園現有大學圖書館擴建工程

Site Plan 工地平面圖



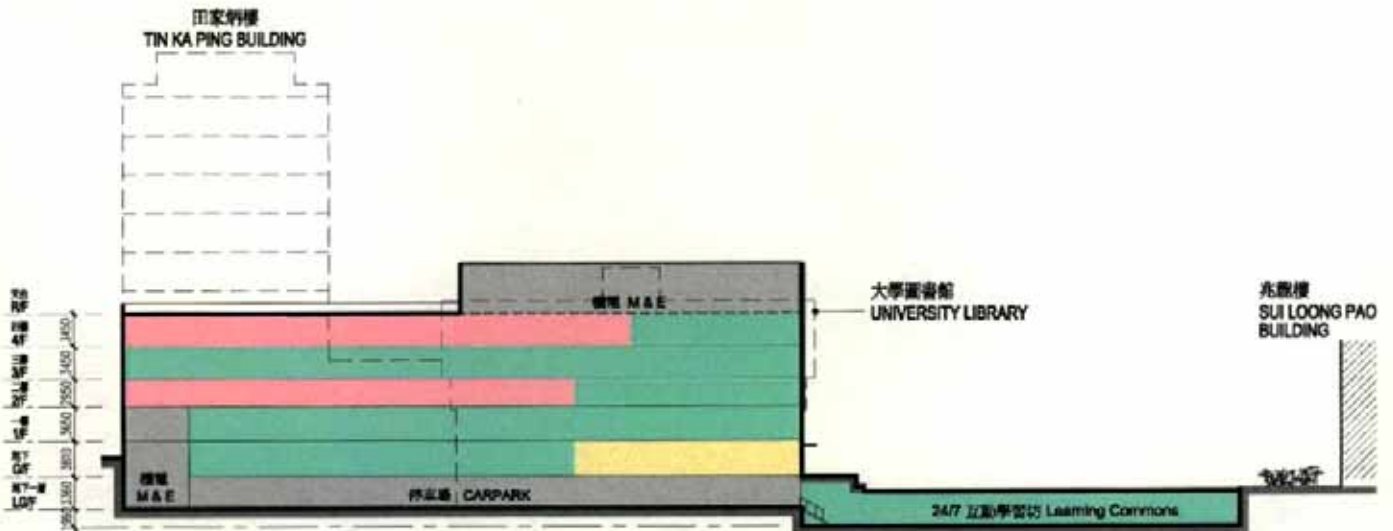
The Chinese University of Hong Kong  
50EF – Extension to the existing University Library at Central Campus  
香港中文大學  
50EF-中央校園現有大學圖書館擴建工程

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



The Chinese University of Hong Kong  
50EF – Extension to the existing University Library at Central Campus  
香港中文大學  
50EF – 中央校園現有大學圖書館擴建工程

Sectional Plan 截面圖



LEGEND:-

-  閱讀及研習空間 READING & STUDY SPACE
-  藏書地方 STACK SPACE
-  辦公室設施 OFFICE FACILITIES

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**List of facilities**

<b>Facilities</b>	<b>Estimated floor area in net operational floor area (NOFA) (m<sup>2</sup>)</b>
(a) Reading and study space	4 526
(b) Stack space	876
(c) Support/service space such as printing room, storage and IT support	452
(d) Office facilities	317
Total	<hr/> 6 171 <hr/>

**Enclosure 5 to PWSC(2009-10)38**

**The Chinese University of Hong Kong  
50EF – Extension to the existing University Library at Central Campus**

**Breakdown of the estimates for consultants' fees and resident site staff costs  
(in September 2008 prices)**

		<b>Estimated man- Months</b>	<b>Average MPS* salary point</b>	<b>Multiplier (Note 1)</b>	<b>Estimated fees (\$ million)</b>
(a) Consultants' fees for contract administration <sup>(Note 2)</sup>	Professional	–	–	–	3.6
(b) Resident site staff costs <sup>(Note 3)</sup>	Technical	79	14	1.6	2.5
Comprising –					
(i) Consultants' fees for management of resident site staff					–
(ii) Remuneration of resident site staff					2.5
				Total	6.1

\* MPS = Master Pay Scale

**Notes**

1. A multiplier of 1.6 is applied to the average MPS point to estimate the costs of resident site staff to be employed by CUHK. (As at 1 April 2008, MPS point 14 = \$19,835 per month.)
2. The consultants' fees for contract administration are calculated in accordance with the existing consultancy agreements. The construction phase of the assignment will only be executed subject to Finance Committee's approval to upgrade 50EF to Category A.
3. CUHK will know the actual man-months and actual costs for resident site staff only after completion of the construction works.

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**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)	6 171
Circulation areas and toilets	2 539
Mechanical and electrical plants	812
Car parking area	1 115
CFA	<u>10 637</u>

(b) NOFA / CFA ratio 58.0%

(c) Estimated construction unit cost (represented by the building and building services costs) \$13,829 per m<sup>2</sup> of CFA (in September 2008 prices)