For discussion **PWSC(2008-09)73**
on 11 February 2009

ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

HEAD 708 – CAPITAL SUBVENTIONS AND MAJOR SYSTEMS AND EQUIPMENT

Universities
The Hong Kong Polytechnic University
26EK – Phase 8 development

Members are invited to recommend to Finance Committee the upgrading of **26EK** to Category A at an estimated cost of $1,337.4 million in money-of-the-day prices for the construction of the phase 8 development by the Hong Kong Polytechnic University.

PROBLEM

The Hong Kong Polytechnic University (PolyU) 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"), and to cater for additional senior year undergraduate places[1] allocated to PolyU.

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[1] To provide more articulation opportunities for sub-degree graduates, the Administration has been creating additional publicly-funded senior year undergraduate places (i.e. Year 2 and Year 3) by phases in the UGC-funded sector. The total number of these places will reach 3 974 by the 2011/12 academic year.

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 **26EK** to Category A at an estimated cost of $1,337.4 million in money-of-the-day (MOD) prices for the construction of the phase 8 development by PolyU.

PROJECT SCOPE AND NATURE

3. The proposed phase 8 development is a 15-storey academic and administration building (including a two-storey basement and a six-storey podium), providing approximately 25 600 square metres (m^2) in net operational floor area (NOFA). The following facilities will be provided by the project –

(a) classrooms and lecture theatres of about 4 000m^2 in NOFA;

(b) teaching and research laboratories of about 14 000m^2 in NOFA;

(c) an open laboratory of about 200m^2 in NOFA;

(d) study spaces of about 400m^2 in NOFA;

(e) offices of about 4 000m^2 in NOFA;

(f) student / staff amenities facilities, including a canteen and activities rooms, of about 3 000m^2 in NOFA;

(g) a pedestrian tunnel across Chatham Road South linking the existing campus and the proposed phase 8 development;

(h) public open space from the lower ground floor to the podium deck; and

(i) a reserve area on ground level to allow space for future railway ancillary facilities to be built at the site for the proposed Sha Tin – Central Link (SCL) development.

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4. A site plan is at Enclosure 1. The view of the building (artist's impression), sectional plan and list of facilities are at Enclosures 2 to 4 respectively. PolyU plans to start construction works in the second quarter of 2009 for completion in the third quarter of 2012.

JUSTIFICATION

5. The new academic structure for senior secondary education and higher education (i.e. the "3+3+4") 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 PolyU, will 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 curriculum under the new academic structure. In addition, extra space and facilities are also required to cater for the additional undergraduate senior year places of the University.

6. PolyU plans to carry out the proposed phase 8 development to provide some 25 600 m^2 in NOFA to support the implementation of "3+3+4" and to meet the space requirement of additional undergraduate senior year places. The project will provide lecture theatres and classrooms of various capacities to cater for common and faculty-based subjects, training facilities and laboratories for applied research and development, study space, offices and amenities facilities.

7. The phase 8 development is proposed to be built on a new site to the northwest of the Campus. The construction site was originally zoned as "Open Space" under the relevant Yau Ma Tei Outline Zoning Plan, and a large part of the site was occupied by the then Kowloon-Canton Railway Corporation (KCRC) as a construction site under temporary lease. In applying for rezoning approval for the phase 8 development on the site[2], PolyU was required by the Town Planning Board to provide open space within the development for access by the public as one of the approval conditions. Having considered the site and design constraints, PolyU will provide the required open space of a total area of about 7 850m^2 at various locations from the lower ground floor to the podium deck (mainly on the ground to the second floors including some covered space), which can be accessed by the public.

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[2] The Town Planning Board approved in April 2007 PolyU's application for rezoning the site from "Open Space" to "Government, Institution or Community(1)" use for the proposed phase 8 development.

8. Before being earmarked for PolyU's phase 8 development, the site was identified for use under the proposed SCL development. According to the SCL railway development under planning, there may be railway development in the vicinity in future and some railway ancillary facilities may need to be accommodated at the site. In order to allow co-existence of these railway facilities with PolyU's proposed development in the same location, PolyU is required to provide reserve space of some 5 140 m^2 in land area in this project. PolyU will hand over the reserve area to the Government for further development upon confirmation of the SCL development in future.

9. In view of the very high traffic volume of the nearby Chatham Road, a pedestrian tunnel will be constructed to link up the phase 8 development with PolyU's existing campus. This will provide a safe and barrier-free pedestrian walkway for students and staff, and avoid causing disruption to the busy traffic flow of Chatham Road.

FINANCIAL IMPLICATIONS

10. SG, UGC, on the advice of D Arch S, recommends approval of the project at a cost of $1,337.4 million in MOD prices (see paragraph 13 below), made up as follows –

		$ million
(a)	Site formation and development	144.2
(b)	Slope remedial works	3.8
(c)	Building	506.0
(d)	Building services	238.8
(e)	Drainage and external works	27.3
(f)	Reserve area for railway facilities	34.1

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			$ million	
(g)	Covered public open space		19.0	
(h)	Pedestrian tunnel		86.8	
(i)	Additional energy conservation measures		5.6	
(j)	Consultants' fees for –		30.5	
	(i) tender assessment	1.2		
	(ii) contract administration	10.3		
	(iii) site supervision	18.7		
	(iv) out-of-pocket expenses	0.3		
(k)	Furniture and equipment		72.6	
(l)	Contingencies		87.7	
	Sub-total		1,256.4 [3]	(in September 2008 prices)
(m)	Provision for price adjustment		81.0	
	Total		1,337.4	(in MOD prices)

11. PolyU will engage consultants to undertake tender assessment, contract administration and site supervision of the construction of the project. A detailed breakdown of the estimate for consultants' fees by man months is at Enclosure 5.

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[3] This represents an increase of 65.2% over the original estimated cost of $760.4 million in September 2005 prices.

12. The construction floor area (CFA) of the phase 8 development is 46 080 m^2 (excluding the provision for reserve area for railway facilities and covered public open space). The estimated construction unit cost, which comprises the building and building services costs, is $16,163 per m^2 of CFA in September 2008 prices. A detailed account of the CFA vis-à-vis the construction unit cost is at Enclosure 6. D Arch S considers the estimated construction unit cost reasonable, having regard to the current economic situation and prevailing construction prices and comparable to those of similar projects such as **20EH** "Baptist University Road campus development" of Hong Kong Baptist University (with an estimated construction unit cost of $16,860 per m^2 of CFA in September 2008 prices).

13. Subject to approval, PolyU will phase the expenditure as follow –

Year	$ million (September 2008)	Price adjustment factor	$ million (MOD)
2009 – 10	206.4	1.03200	213.0
2010 – 11	363.2	1.05264	382.3
2011 – 12	487.8	1.07369	523.7
2012 – 13	179.4	1.09517	196.5
2013 – 14	19.6	1.11707	21.9
	1,256.4		1,337.4

14. 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 building and construction output for the period 2009 to 2014. PolyU 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.

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

PUBLIC CONSULTATION

16. Before the planning application was approved in 2007, views of the public including residents in the vicinity have been invited. Whilst some residents expressed support to the project, concerns on the building height, loss of public greenery, and potential visual impact of the new campus building were raised. PolyU has addressed the concerns collected by adjusting the building design, shifting the building away from the nearby residential development and providing greenery and public open space on the ground and podium floors. Furthermore, PolyU conducted a presentation to Members of the Yau Tsim Mong District Council on the project in June 2008. Members attending the meeting raised no objection to the project.

17. PolyU organised an open forum in June 2008 to consult its staff and students on the design of the proposed development. The participants gave positive comments and were generally in support of the project.

18. We submitted a paper on this project to the Legislative Council Panel on Education for discussion on 12 January 2009. Members did not object to the proposal but raised questions on the provision of the reserve area for railway facilities. As explained at the Panel meeting, by accommodating academic use, open space and reserve area for railway facilities in one composite development, the phase 8 development will fully utilise the site which would otherwise be restricted to use for either open space or railway facilities and represents a win-win solution for the parties concerned. To cater for the reserve area, PolyU will need to provide a bare shell structure, which is estimated to cost around $34 million (September 2008 prices). Separately, a basement is necessary due to the various site constraints: (i) limited buildable site area, (ii) height restriction, and (iii) need for the provision of public open space and reserve area for railway facilities. This involves an extra construction cost of around $64 million (September 2008 prices).

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19. Some Members requested that the costs for the provision of the reserve area be transferred to the SCL [4] project vote. We consider such arrangement unnecessary, as the costs for the provision of the reserve area and the capital costs of the SCL project will both be funded by the Government.

ENVIRONMENTAL IMPLICATIONS

20. The project is not a designated project under the Environmental Impact Assessment Ordinance (Cap. 499). The project will not cause long-term environmental impact. PolyU has included in the project estimates the cost for implementing suitable mitigation measures to control short term environmental impacts.

21. During construction, PolyU 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. When the buildings are in use, PolyU will equip all noise sensitive rooms in the proposed development with central air-conditioning system and well-gasketted windows to abate traffic noise impact from nearby roads.

22. PolyU has considered measures (e.g. the optimization of the foundation layout by suitable piling design and the use of metal hoarding frameworks and signboards so that these materials can be recycled and reused in other projects) in the planning and design stages to reduce the generation of construction waste where possible. In addition, PolyU will require the contractor to reuse inert construction waste (e.g. excavated materials) on site or in other suitable construction sites as far as possible, in order to minimize the disposal of inert construction waste at public fill reception facilities[5]. PolyU 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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[4] The Government shall own and fund the construction costs of the SCL, and shall receive concession payments from the railway operator upon completion.

[5] 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 at public fill reception facilities requires a licence issued by the Director of Civil Engineering and Development.

23. PolyU will also require the contractor to submit for approval a plan setting out its waste management measures which will include appropriate mitigation means to avoid, reduce, reuse and recycle inert construction waste. PolyU will ensure that the day-to-day operations on site comply with the approved plan. PolyU will require the contractor to separate the inert portion from non-inert construction waste on site for disposal at appropriate facilities. PolyU 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.

24. PolyU estimates that the project will generate in total about 49 930 tonnes of construction waste. Of this, PolyU will reuse about 11 840 tonnes (23.7%) of inert construction waste on site and deliver 35 510 tonnes (71.1%) of inert construction waste to public fill reception facilities for subsequent reuse. In addition, PolyU will dispose of 2 580 tonnes (5.2%) of non-inert construction waste at landfills. The total cost of accommodating construction waste at public fill reception facilities and landfills is estimated to be $1,281,270 for this project (based on a unit cost of $27/tonne for disposal at public fill reception facilities and $125/tonne[6] at landfills).

ENERGY CONSERVATION MEASURES

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

(a) water-cooled chillers and evaporative cooling towers;

(b) rotary heat wheel for primary air-handling units;

(c) demand control of fresh air supply with carbon dioxide sensor;

(d) occupancy and daylight sensors for lighting control;

(e) light-emitting diode (LED) type exit signs; and

(f) automatic lighting and ventilation control for lifts.

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[6] 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^3), nor the cost to provide new landfills (which is likely to be more expensive) when the existing ones are filled.

26. For renewable energy technologies, this project will adopt solar lightings in landscape area.

27. For greening features, this project will adopt greening at different levels including podium gardens.

28. For recycling features, this project will adopt recycling of air-conditioning condensation water for air-conditioning make-up water.

29. The total estimated additional cost for adoption of the above features is around $5.6 million. There will be about 9% energy savings.

HERITAGE IMPLICATIONS

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

LAND ACQUISITION

31. The project does not require any land acquisition.

BACKGROUND INFORMATION

32. 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 PolyU's proposal, SG, UGC has, in consultation with D Arch S, adjusted the project estimate proposed by PolyU to arrive at the project estimate set out in paragraph 10 above.

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33. We upgraded **26EK** to Category B in April 2006. PolyU engaged consultants in December 2007 to carry out topographical survey, site investigation, preliminary design, detailed design and to prepare tender documents at a total estimated cost of $21.7 million. We charged $15 million of the cost to block allocation Subhead **8100EX** "Alterations, additions, repairs and improvements to the campuses of UGC-funded institutions" and PolyU contributed $6.7 million to finance the remaining balance. The consultants have completed the topographical survey, site investigation, preliminary design and detailed design of the project. PolyU is finalising the tender documents for this project.

34. The project will involve removal of 84 trees, including 52 trees to be felled and 32 trees to be transplanted within the project site. All trees to be removed are not important trees[7]. PolyU will incorporate planting proposals as part of the project, which will include an estimated quantity of 170 trees.

35. PolyU estimates that the project will create about 400 jobs (355 for labourers and another 45 for professional/technical staff) providing a total employment of 14 800 man-months.

Education Bureau
February 2009

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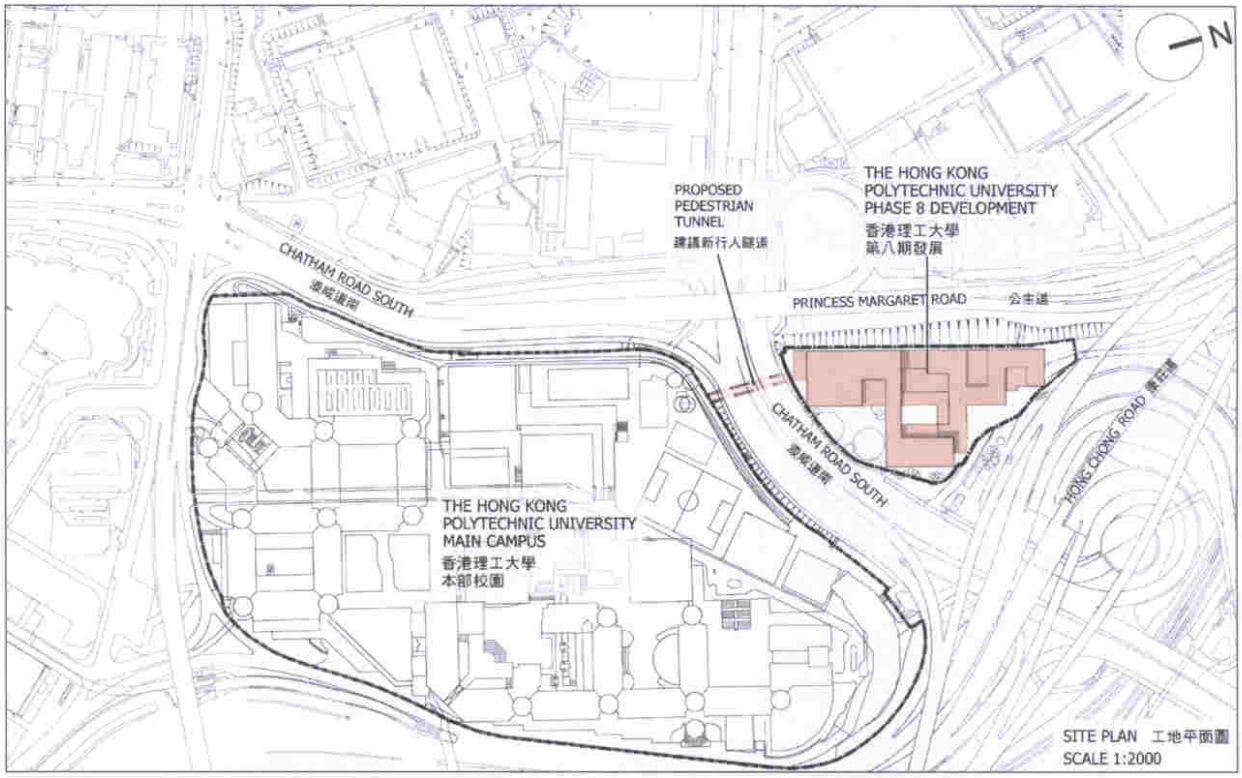
[7] "Important trees" refer to trees in the Register of Old and Valuable Trees, or any other trees that meet one or more of the following criteria –

(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.

Hong Kong Polytechnic University
26EK - Phase 8 development
香港理工大學
26EK - 第8期發展計劃

Site Plan
工地平面圖



Phase 8 Development
第八期發展計劃

Site Area: 10 200m^2
工地面積：10 200 平方米

附件 2 Enclosure 2 to PWSC(2008-09)73

Hong Kong Polytechnic University
26EK - Phase 8 development
香港理工大學
26EK - 第8期發展計劃

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

Hong Kong Polytechnic University
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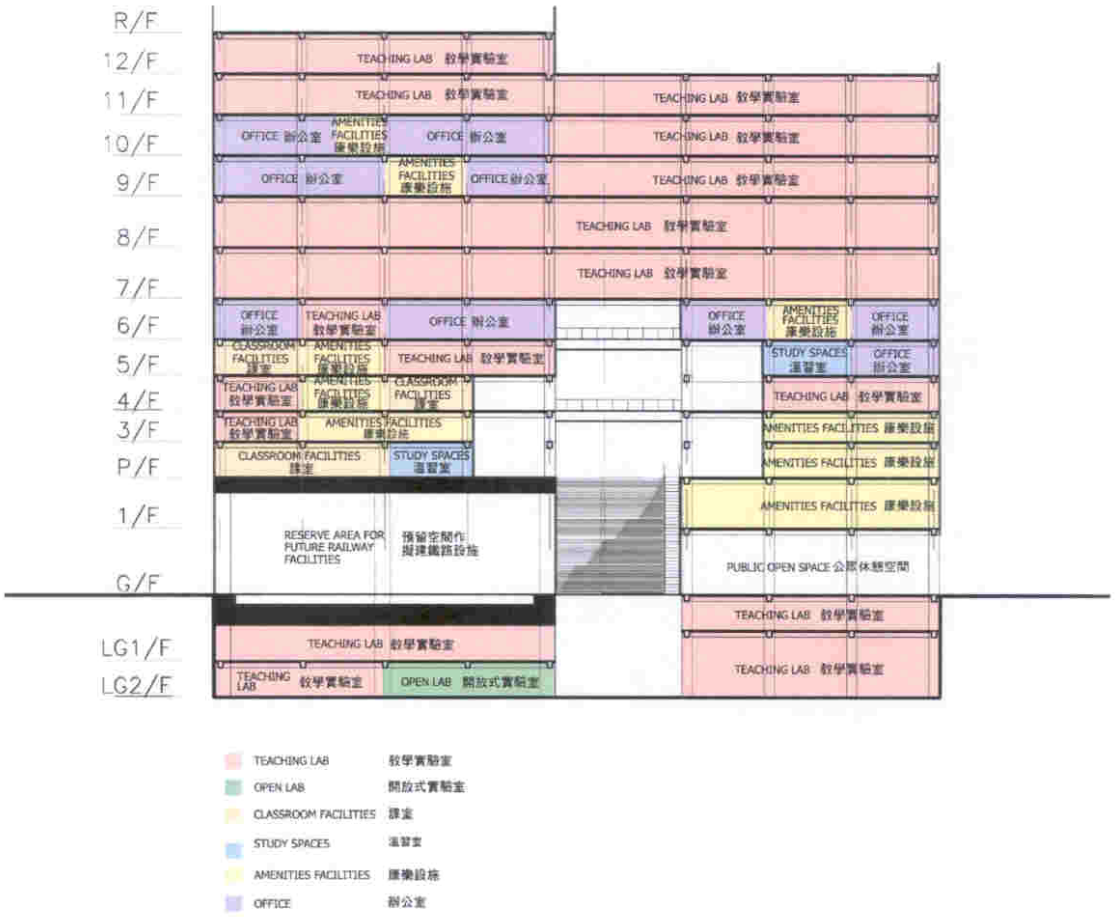
香港理工大學
26EK - 第8期發展計劃

Sectional Plan 截面圖



Enclosure 4 to PWSC(2008-09)73

The Hong Kong Polytechnic University
26EK – Phase 8 development

List of facilities

	Facilities	Estimated floor area in net operational floor area (NOFA) (m^2)
(a)	Classroom facilities	4 000
(b)	Teaching and research laboratories	14 000
(c)	Open laboratories	200
(d)	Study space	400
(e)	Offices	4 000
(f)	Amenities facilities	3 000
	Total	25 600

The Hong Kong Polytechnic University
26EK – Phase 8 development

Breakdown of the estimate for consultants' fees[Note 1]

			Estimated man-months	Average MPS* salary point	Multiplier [Note 2]	Estimated fee ($ million) (Sept 2008)
(a)	Consultants' fees [Note 3]					
	(i) Tender assessment	Professional	–	–	–	0.7
		Technical	–	–	–	0.5
	(ii) Contract administration	Professional	–	–	–	6.6
		Technical	–	–	–	3.7
(b)	Site supervision [Note 4]	Professional	115.5	38	1.6	11.2
		Technical	236.0	14	1.6	7.5
(c)	Out of pocket expenses [Note 5] Lithography and other direct expenses		–	–	–	0.3
					Total	30.5

* MPS = Master Pay Scale

Notes

1. Having examined the consultants' fees estimated by PolyU, the Director of Architectural Services considers the figures acceptable.

2. A multiplier of 1.6 is applied in respect of site supervision staff to be employed by PolyU. (As at 1 April 2008, MPS point 38 = $60,535 per month, and MPS point 14 = $19,835 per month.)

3. The consultants' fees for tender assessment and contract administration are calculated in accordance with the existing consultancy agreements for the design and construction of **26EK.** The assignment will only be executed subject to Finance Committee's approval to upgrade **26EK** to Category A.

4. PolyU will know the actual man-months and actual costs for site supervision only after completion of the construction works.

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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.

Enclosure 6 to PWSC(2008-09)73

The Hong Kong Polytechnic University
26EK – Phase 8 development

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

(a)	Breakdown of CFA[8]	**Estimated floor area (m^2)**
		Total
	Net operational floor area (NOFA)	25 600
	Circulation areas, toilets	16 480
	Mechanical and electrical plants	4 000
	CFA	46 080
(b)	NOFA / CFA ratio	55.6%
(c)	Estimated construction unit cost (represented by the building and building services costs)	\$16,163 per m^2 of CFA (in September 2008 prices)

[8] Excluding the provision for reserve land area of 5 140m^2 (4 100m^2 in CFA) for railway facilities and public open space of a total floor area of 7 850m^2 (3 900m^2 in CFA).