

For discussion  
on 12 June 2002

PWSC(2002-03)49

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

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

#### **Universities**

**The Hong Kong Polytechnic University**

**25EK – Phase 7 development**

Members are invited to recommend to Finance Committee the upgrading of **25EK** to Category A at an estimated cost of \$498.9 million in money-of-the-day prices for the phase 7 development of the Hong Kong Polytechnic University.

#### **PROBLEM**

The Hong Kong Polytechnic University (PolyU) 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 to upgrade **25EK** to Category A at an estimated cost of \$498.9 million in money-of-the-day (MOD) prices for the construction of PolyU's phase 7 development.

**/PROJECT .....**

## PROJECT SCOPE AND NATURE

3. The scope of project **25EK** comprises the following –
- (a) demolition of a vacant nine-storey operational staff quarter (Pak Nin Yuen) and a two-storey Y-Block (with a net operational floor area (NOFA) of 540 square metres, currently being used for teaching and professional development activities);
  - (b) temporary reprovisioning of the existing Y-Block facilities to the BC Wing within the PolyU campus; and
  - (c) construction of a 14-storey building of 17 355 square metres in NOFA.

4. The proposed development will provide additional accommodation for general and specialist teaching, research, and staff accommodation. Facilities will include lecture theatres, classrooms, workshops, teaching and research laboratories with specially designed facilities and systems such as fume cupboards and laboratory benches for science, engineering and electromagnetic researches. A list of facilities is at Enclosure 1. A site plan is at Enclosure 2. PolyU plans to commence the demolition works in September 2002 and commence the construction works in March 2003 for completion in September 2005.

## JUSTIFICATION

5. PolyU needs additional space and facilities to meet its teaching and research needs and to provide a congenial environment for its students and staff. Currently, PolyU has to adopt office-sharing by academic staff, convert communal space of about 2 200 square metres in NOFA to academic and research uses and cut down the space allowed for non-academic activities such as common rooms, stores and library.

6. According to a study on space and accommodation at UGC-funded institutions completed in February 2000, PolyU has a 29% shortfall in accommodation provision equivalent to 48 616 square metres in NOFA. With the completion of **22EK** “Phase 6 development” in September 2001 (upgraded to Category A in February 1997), PolyU still has a space shortfall of 31 516 square metres in NOFA. The proposed phase 7 development is to provide additional 16 815 square metres in NOFA (after deducting 540 square metres for the demolition of Y-Block) to meet current shortfall.

7. Experiments play an important role in the learning process for engineering and science disciplines. With the advancement in science and technology, increased research and teaching activities relating to engineering and electromagnetic researches have to be undertaken in specially fitted out facilities of stringent safety standards. Simple conversion of the existing premises would not be able to meet the modern laboratory environment and safety standards.

8. Moreover, the conversion of Pak Nin Yuen and Y-Block is not viable because the former was designed for domestic purpose and the latter provides only 540 square metres in NOFA.

### FINANCIAL IMPLICATIONS

9. SG, UGC, on the advice of D Arch S, recommends approval of the project at a cost of \$498.9 million in MOD prices (see paragraph 12 below), made up as follows –

	<b>\$ million</b>
(a) Consequential works <sup>1</sup>	2.2
(b) Demolition	2.9
(c) Piling	36.6
(d) Building	209.7
(e) Building Services	123.6
(f) External works and utilities	10.0
(g) Consultants' fees for –	12.2
(i) Assessment of tenders	0.7
(ii) Contract administration	4.3
(iii) Site supervision	6.7
(iv) Out-of-pocket expenses	0.5

/(h) .....

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<sup>1</sup> About 540 square metres in NOFA in the BC Wing will be renovated to provide information technology and teaching facilities for the temporary reprovisioning of Y-Block facilities. This cost is considered reasonable by D Arch S.

	<b>\$ million</b>	
(h) Furniture and equipment <sup>2</sup>	63.9	
(i) Contingencies	46.1	
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Sub-total	507.2	(in September 2001 prices)
(j) Provision for price adjustment	(8.3)	
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Total	498.9	(in MOD prices)
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10. The construction floor area (CFA)<sup>3</sup> of this project is 30 821 square metres. The estimated construction unit cost, represented by the building and building services costs, is \$10,814 per square metre of CFA in September 2001 prices. D Arch S considers the estimated unit cost to be reasonable and comparable with those of similar projects, such as **22EK** "Phase 6 development" (upgraded to Category A in February 1997), the estimated construction unit cost of which was \$10,346 per square metre of CFA in September 2001 prices.

11. A detailed breakdown of the estimate for consultants' fees by man-months is at Enclosure 3.

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

<b>Year</b>	<b>\$ million (Sept 2001)</b>	<b>Price adjustment factor</b>	<b>\$ million (MOD)</b>
2002 – 03	12.6	0.98625	12.4
			/2003 – 04 .....

<sup>2</sup> Based on 12.5% of the building and building services cost of the project estimate (\$41.7 million) and a list of specialist equipment required (estimate at \$22.2 million). Examples of specialist equipment include fume cupboards, safety cabinets, and laboratory benches.

<sup>3</sup> CFA is a technical term describing the amount of building works completed. It is the sum of all areas at all floor levels (including basements, mezzanine floors, balconies and enclosed rooftop structures), measured to the outer face of the external walls including external cladding (i.e. the main building line, and measured over all partitions, columns, internal or external structures and load-bearing walls, party walls, stair wells, lift wells, escalator openings, pipe and drain ducts, cable riser shafts and the like). The areas of bay windows are also included. Generally, decorative features which project beyond the outer face of external walls such as fins, architraves, solar shading devices and the like are excluded from the calculation of CFA. Also excluded are uncovered trafficable roof areas such as external playgrounds and landscaped areas.

Year	\$ million (Sept 2001)	Price adjustment factor	\$ million (MOD)
2003 – 04	109.5	0.98378	107.7
2004 – 05	201.6	0.98378	198.3
2005 – 06	161.2	0.98378	158.6
2006 – 07	22.3	0.98378	21.9
	507.2		498.9

13. We derived the MOD estimates on the basis of the Government's latest forecast of trend labour and construction prices for the period 2002 to 2007. Subject to Members' approval, PolyU 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.

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

## **PUBLIC CONSULTATION**

15. We consulted the Legislative Council Panel on Education on 13 May 2002. At the panel meeting, Members enquired about the decision to demolish a vacant operational staff quarter. The UGC considers the decision in line with the changed operational needs of PolyU and a sound one, taking into account the proposed optimal use of the vacated site. In respect of Members' concern about the utilisation of the proposed site, the UGC considers the proposed development reasonable having regard to the overall site utilisation of the entire campus, the current over-crowdedness of PolyU and the future development of the institution. The reply to the issues raised by the panel is at Enclosure 4.

## **ENVIRONMENTAL IMPLICATIONS**

16. The project will not cause long term environmental impact. We have included in the project estimates the cost to implement suitable mitigation measures to control short term environmental impacts.

17. 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 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.

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

19. PolyU 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. PolyU will ensure that the day-to-day operations on site comply with the approved WMP. PolyU will control the disposal of public fill and C&D waste to designated public filling facilities and landfills respectively through a trip-ticket system. The contractor will be required to separate public fill from C&D waste for disposal at appropriate facilities. PolyU will record the disposal, reuse and recycling of C&D materials for monitoring purposes. PolyU estimate that the project will generate about 19 000 cubic metres (m<sup>3</sup>) of C&D materials. Of these, PolyU will reuse about 5 250 m<sup>3</sup> (28%) on site, 11 600 m<sup>3</sup> (61%) as fill in public filling areas<sup>4</sup>, and dispose of 2 150 m<sup>3</sup> (11%) at landfills. The notional cost of accommodating C&D waste at landfill sites is estimated to be \$268,750 for this project (based on a notional unit cost<sup>5</sup> of \$125/m<sup>3</sup>).

## LAND ACQUISITION

20. The project does not require land acquisition.

**/BACKGROUND .....**

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<sup>4</sup> 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.

<sup>5</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 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.

**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. The UGC refers those supported proposals to the Government. 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 2 above. A comparison of the project estimate proposed by PolyU and the revised estimate recommended by the UGC and agreed by PolyU is at Enclosure 5.

22. We upgraded **25EK** to Category B in July 2000. PolyU engaged consultants to carry out a topographical survey in July 2001, site investigation and detailed design in October 2001 and prepare tender documents in January 2002 at a total cost of \$9.3 million. We charged this amount to block allocation **Subhead 8100EX** "Alternations, 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. The consultant is finalising the tender documents.

23. PolyU estimates that the proposed works under **25EK** will create 290 jobs, with a total of 7 030 man-months, comprising five professional staff, 15 technical staff and 270 labourers.

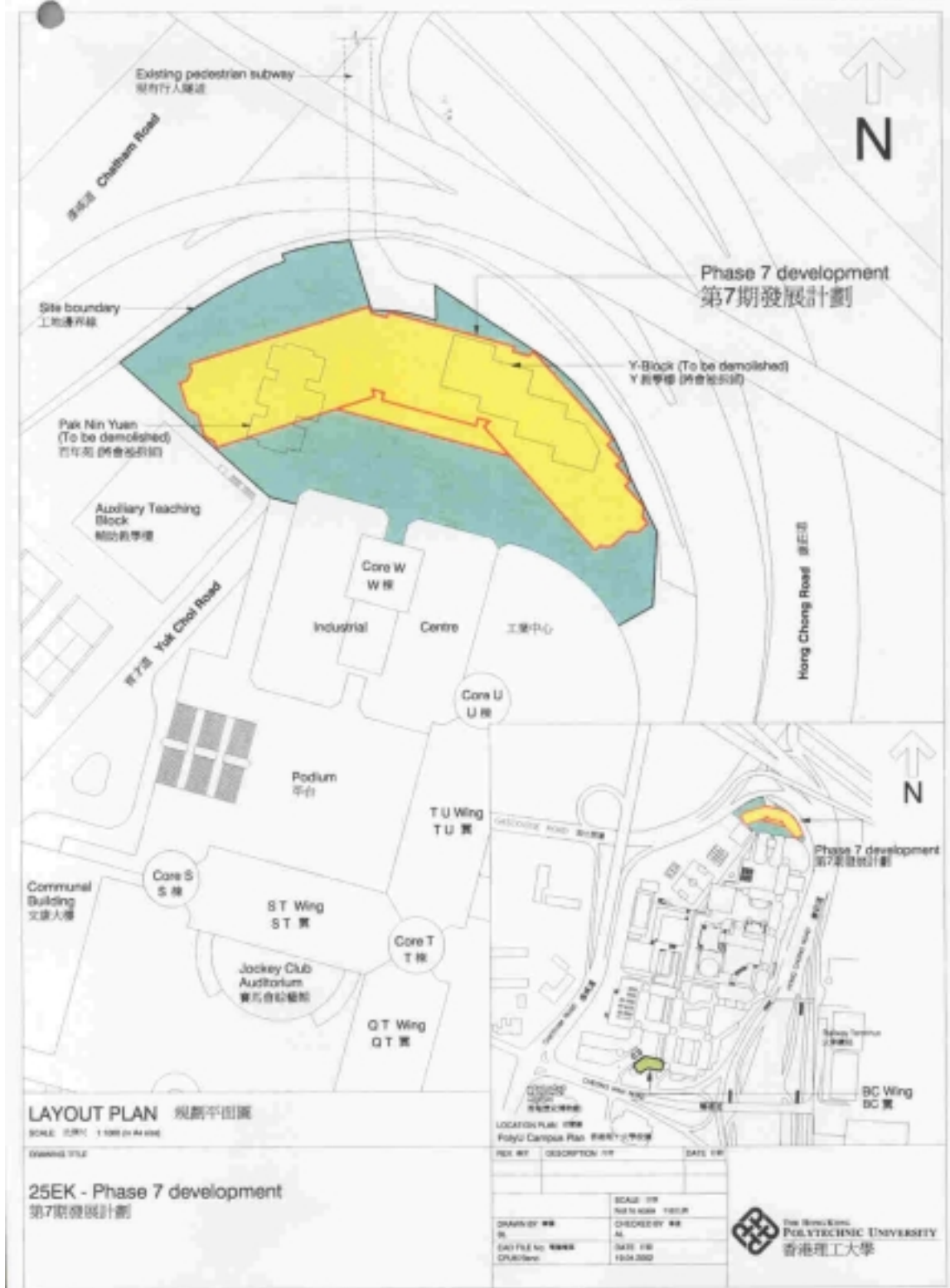
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Education and Manpower Bureau  
June 2002

**The Hong Kong Polytechnic University  
25EK – Phase 7 development**

**List of facilities**

<b>Facilities</b>	<b>Estimated floor area in NOFA (m<sup>2</sup>)</b>
(a) Lecture theatres and classrooms	4 670
(b) Workshops and teaching laboratories	3 975
(c) Research laboratories	2 070
(d) Office facilities	6 040
(e) Student / staff amenities	300
(f) Storerooms and support facilities	300
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Total	17 355
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LAYOUT PLAN 規劃平面圖

SCALE: 1:100 (1/4"=1'-0")

DRAWING TITLE

25EK - Phase 7 development  
第7期發展計劃

LOCATION PLAN 位址圖

PolyU Campus Plan 香港理工大學校園圖

REV. NO. DESCRIPTION DATE

SCALE: 1/8"

NOT TO SCALE 1/8"=1'-0"

CHECKED BY: AL

DATE: 15/04/2004

DRAWN BY: W

DATE: 15/04/2004



**The Hong Kong Polytechnic University  
25EK – Phase 7 development**

**Breakdown of the estimate for consultants' fees**

			Estimated man- months	Average MPS* salary point	Multiplier	Estimated fee (\$ million)
(a) Consultants' staff costs						
(i) Assessment of tenders	Professional		4.0	38	2.4	0.6
	Technical		2.5	14	2.4	0.1
(ii) Contract administration	Professional		26.0	38	2.4	3.8
	Technical		10.0	14	2.4	0.5
(b) Site supervision by resident site staff employed directly by PolyU	Professional		49.5	38	1.7	5.1
	Technical		49.5	14	1.7	1.6
Sub-total						11.7
(c) Out-of-pocket expenses						
Lithography and other direct expenses						0.5
Sub-total						0.5
Total						12.2

\* **MPS = Master Pay Scale**

**Notes**

1. A multiplier of 2.4 is applied to the average MPS point to estimate the full staff costs including the consultants' overheads and profit, as the staff will be employed in the consultants' offices. A multiplier of 1.7 is applied in the case of contract staff employed by PolyU direct on the project. (At 1 April 2001, MPS point 38 is \$60,395 per month and MPS point 14 is \$19,510 per month.)
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 PolyU. D Arch S has examined the figures and considered them reasonable.

**The Hong Kong Polytechnic University  
25EK – Phase 7 development**

**Supplementary note**

In considering the paper referenced LC Paper No. CB(2)1855/01-02(01) on **25EK** at the Legislative Council Panel on Education on 13 May 2002, Members raised for discussion issues relating to the development potential of the proposed development, background of the operational quarters to be demolished and the implications of the Higher Education Review on PolyU's space requirement. Some further information on these issues has been provided to panel Members in a form of a letter dated 25 May 2002, the gist of which is summarised below.

***Utilisation Potential***

2. In designing the proposed development, PolyU is conscious of the need to make effective use of the site concerned and equally important, the need to provide an environment conducive to teaching, learning and research from an educational point of view. The UGC considers that the proposed development has struck a good balance between the two having regard to the overall campus development of PolyU, the utilisation potential of the site, the space requirement of PolyU, etc. In designing the new building, PolyU has also given due consideration to its compatibility, efficiency, student throughput and vertical circulation within the building as more than 60% of the space will be taken up for teaching.

***Background of Pak Nin Yuen to be demolished***

3. The vacant nine-storey staff quarter (Pak Nin Yuen) was built in 1982 as a government project at a cost of \$6.5 million, providing 40 residential units for the minor staff attending essential duties at non-office hours. It was built at a time when public transportation and telecommunication devices were much less developed than it is now. With rapid developments in those areas in the past two decades, in-house provision of such services is no longer a necessity. The essential duties are gradually being taken over by staff not residing in these quarters, including those engaged through out-sourcing arrangements. Pak Nin Yuen has thus been vacated since mid 2001. Re-development of the site to be vacated also represents a much more effective use of the site concerned. As for the other UGC-funded institutions, six have operational/minor staff quarters, totalling about 400 flats/units. A majority of these quarters are found in institutions which are less conveniently-located.

*Implications of the Higher Education Review*

4. Regarding the implications of the Higher Education Review on the space requirement of PolyU, Members may wish to note that the proposed phase 7 development aims to address the existing space shortfall of the University, which has been persisting for quite some time. The proposed development will fulfil about half of PolyU's existing space requirement. The remaining shortfall will have to be met by another development, which will be subject to careful scrutiny by UGC and the Administration in the light of future development of higher education. The UGC considers it a prudent and pragmatic approach in alleviating the urgent and persisting space shortfall of PolyU.

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

**\$ million (in Sept 2001 prices)**

<b>Project</b>	<b>Amount proposed by PolyU</b>	<b>Amount recommended by UGC</b>	<b>Amount of reduction</b>
PolyU – Phase 7 development	509.5	507.2	2.3

**Note**

The net reduction of \$2.3 million results from trimming the estimate on –

- (a) construction cost by \$2 million;
- (b) consultants' fees by \$100,000; and
- (c) contingencies by \$200,000.