For discussion **PWSC(2001-02)59**
on 17 October 2001

ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

HEAD 703 - BUILDINGS
Education - Secondary
239ES - Secondary school in Area 36, Fanling

Education - Primary
284EP - Primary school in Area 36, Fanling
293EP - Second primary school in Area 36, Fanling

Members are invited to recommend to Finance Committee the upgrading of **239ES**, **284EP** and **293EP** to Category A at an estimated cost of $104.9 million, $93.1 million and $93.6 million respectively in money-of-the-day prices for the construction of one secondary school and two 30-classroom primary schools in Area 36, Fanling.

PROBLEM

We do not have enough secondary schools to meet the increase in demand for new school places by the school year 2003/04. We also need to provide additional primary schools to implement the whole-day primary schooling policy.

/PROPOSAL …..

PROPOSAL

2. The Director of Architectural Services (D Arch S), with the support of the Secretary for Education and Manpower, proposes to upgrade the following projects to Category A at an estimated total cost of $291.6 million in money-of-the-day (MOD) prices -

			Project estimate $ million (MOD)
(a)	**239ES** -	Secondary school in Area 36, Fanling	104.9
(b)	**284EP** -	Primary school in Area 36, Fanling	93.1
(c)	**293EP** -	Second primary school in Area 36, Fanling	93.6
		Total	291.6

PROJECT SCOPE AND NATURE

3. The three proposed schools, comprising one 30-classroom secondary school and two 30-classroom primary schools, are located in Area 36, Fanling. The facilities for the three schools will include -

		(Secondary school)	**(Primary schools)**	
		239ES	**284EP**	**293EP**
(a)	classrooms;	30	30	30
(b)	special rooms, including a computer-assisted learning room and a language room;	16	6	6
(c)	small group teaching rooms;	3	4	4
(d)	guidance activity room;	1	1	1
(e)	interview rooms;	2	2	2

/(e) …..

		(Secondary school)	(Primary schools)	
		239ES	**284EP**	**293EP**
(f)	staff rooms;	1	1	1
(g)	staff common room;	1	1	1
(h)	student activity centre;	1	1	1
(i)	conference room;	1	1	1
(j)	library;	1	1	1
(k)	assembly hall (which, together with the roof of the assembly hall block, can also be used for a wide range of physical activities such as badminton, gymnastics and table-tennis);	1	1	1
(l)	multi-purpose area;	1	1	1
(m)	basketball courts (including two on ground level and one at the rooftop of the assembly block);	3	3	3
(n)	green corner[1];	1	1	1
(o)	ancillary accommodation including a lift and relevant facilities for the handicapped;	Available	Available	Available

Shared facilities

(p) a mini-soccer pitch (to be shared by **239ES** and **284EP**).

/These …..

These schools will all meet the planning target of providing two square metres of open space per student. A site plan for the schools is at Enclosure 1.

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[1] The green corner is a designated area inside the campus to enable students to develop an interest in horticulture and natural environment. The green corner may include a green house, a weather station and planting beds.

D Arch S plans to start construction works for **239ES**, **284EP** and **293EP** in January 2002 for completion in August 2003.

JUSTIFICATION

239ES - Secondary school in Area 36, Fanling

4. The Director of Education (D of E) forecasts that 290 additional secondary school classes will still be required in the territory by the school year 2003/04 to meet the increase in demand for new places. **239ES**, together with **232ES**, **233ES**, **240ES**, **241ES** and **242ES**, to be considered by Members at this meeting (see papers referenced PWSC(2001-02)58 and PWSC(2001-02)57) will provide a total of 240 classrooms. We plan to meet the projected shortfall in future through further school construction projects.

284EP - Primary school in Area 36, Fanling
293EP - Second primary school in Area 36, Fanling

5. The Government's interim target is to enable 60% of our primary school students to study in whole-day schools by the 2002/03 school year. To achieve this target, 78 new primary schools are required between the 1998/99 and the 2002/03 school years. To date, 52 schools have already been completed, and a further 26 are at various stages of construction.

6. The Government is further committed to enabling virtually all primary school students to study in whole-day schools by the 2007/08 school year. To this end, D of E plans to construct another 46 new schools between the 2003/04 and the 2007/08 school years. To date, nine projects have been upgraded to Category A. **284EP** and **293EP** will help achieve this policy target. Another two schools, covered in **279EP** and **292EP**, will also be considered by Members at this meeting (see papers referenced PWSC(2001-02)58 and PWSC(2001-02)60).

7. North District, in which **284EP** and **293EP** are located, currently has 28 public sector primary schools providing 487 classrooms. D of E forecasts that an additional 71 classrooms will be required for full implementation of whole-day primary schooling by the school year 2007/08. **284EP** and **293EP** will help reduce the shortfall by 60 classrooms to 11 classrooms in this district and will enable existing bi-sessional primary schools to convert into whole-day operation. We plan to meet the remaining shortfall in this district through another school construction project.

/**FINANCIAL** …..

FINANCIAL IMPLICATIONS
FINANCIAL IMPLICATIONS

8. We estimate the capital cost of **239ES**, **284EP** and **293EP** to be $104.9 million, $93.1 million and $93.6 million respectively in MOD prices (see paragraph 10 below), made up as follows -

		$ million			
		239ES	**284EP**	**293EP**	
(a)	Site formation	-	0.8	-	
(b)	Piling	15.3	12.3	12.3	
(c)	Building	54.9	45.3	45.3	
(d)	Building services	14.4	12.4	13.6	
(e)	Drainage and external works	10.5	9.5	9.5	
(f)	Furniture and equipment[2]	-	4.5	4.5	
(g)	Contingencies	9.5	8.0	8.1	
	Sub-total	104.6	92.8	93.3	(in September 2001 prices)
(h)	Provisions for price adjustment	0.3	0.3	0.3	
	Total	104.9	93.1	93.6	(in MOD prices)

9. The respective estimated construction unit costs for **239ES**, **284EP** and **293EP** in September 2001 prices, represented by building and building services costs, are as follows -

/**239ES** …..

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[2] Based on a standard furniture and equipment list prepared by Education Department for "Year 2000 design" school.

Project no.	Construction floor area (CFA) m^2	Estimated construction unit cost per m^2 of CFA $
239ES	12 238	5,663
284EP	10 727	5,379
293EP	10 727	5,491

D Arch S considers the estimated construction unit costs comparable to similar school projects built by the Government. A comparison of the reference cost for a secondary school based on an uncomplicated site with no unusual environmental or geotechnical constraints with the estimated cost for **239ES** is at Enclosure 2. A similar comparison between a 30-classroom primary school and **284EP** and **293EP** is at Enclosure 3.

10. Subject to approval, we will phase the expenditure as follows -

Year	$ million (September 2001)			Price adjustment factor	$ million (MOD)		
	239ES	**284EP**	**293EP**		**239ES**	**284EP**	**293EP**
2001 - 02	3.0	2.0	2.0	1.00000	3.0	2.0	2.0
2002 - 03	45.0	38.0	38.0	0.99700	44.9	37.9	37.9
2003 - 04	42.0	41.1	40.3	1.00398	42.2	41.3	40.5
2004 - 05	11.6	8.7	10.0	1.01101	11.7	8.8	10.1
2005 - 06	3.0	3.0	3.0	1.01808	3.1	3.1	3.1
	104.6	92.8	93.3		104.9	93.1	93.6

/11. …..

11. We derived the MOD estimates on the basis of Government's latest forecast of trend labour and construction prices for the period 2001 to 2006. We will deliver the works through a fixed-price lump-sum contract because the contract period of each schools will be less than 21 months and we can clearly define the scope of works in advance, leaving little room for uncertainty.

12. The cost of furniture and equipment[3] for **239ES**, estimated to be $9.4 million, will be borne by the school sponsor as the school will be allocated to meet increase in demand for schools places. For **284EP** and **293EP**, the cost of furniture and equipment will be borne by the Government as the schools will enable existing bi-sessional schools to convert into whole-day operation. These are in line with existing policies.

13. We estimate the annual recurrent expenditure for **239ES** to be $40.9 million and for **284EP** and **293EP** to be $22.2 million each.

PUBLIC CONSULTATION

14. We consulted North District Council Social Services Committee on **239ES** and **284EP** in December 2000 and **293EP** in April 2001. Members of the District Council supported the projects.

ENVIRONMENTAL IMPLICATIONS

15. We conducted Preliminary Environmental Reviews (PERs) for **239ES** and **284EP** in November 1999 and **293EP** in August 2000. The PERs concluded that the schools would not be subject to adverse environmental impacts provided that we implement the following environmental mitigation measures to keep the road traffic noise impact within the limits recommended in the Hong Kong Planning Standards and Guidelines -

/**239ES** …..

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[3] Based on a standard furniture and equipment list prepared by Education Department for "Year 2000 design" school.

Project no.	Mitigation measures	Estimated cost $ million (in Sept 2001 prices)
239ES	(a) Provision of insulated windows and air-conditioning to one small group teaching room on the 1/F at the north-eastern façade of the assembly hall block	0.1
284EP	(b) Provision of insulated windows and air-conditioning to four special rooms on 2/F and 3/F at the eastern façade of the special room block	0.5
293EP	(c) Provision of insulated windows and air-conditioning to 18 classrooms and four small group teaching rooms from the 1/F to the 6/F at the eastern façade of the classroom block	1.7

We have included the costs of these mitigation measures in the project estimates for the schools concerned as part of the building services works.

16. During construction, we 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.

17. At the planning and design stages, we have considered measures to reduce the generation of construction and demolition (C&D) materials. D Arch S has introduced more prefabricated building elements into the school designs to reduce temporary formwork and construction waste. These include dry-wall partitioning and proprietary fittings and fixtures. We will use suitable excavated materials for filling within the site to minimise off-site disposal. In addition, we will require the contractors to use metal site hoardings and signboards so that these materials can be recycled or reused in other projects.

/18. …..

18. D Arch S will require the contractors to submit waste management plans (WMPs) for approval. The WMPs will include appropriate mitigation measures to avoid, reduce, reuse and recycle C&D materials. D Arch S will ensure that the day-to-day operations on site comply with the approved WMPs. D Arch S 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 contractors will be required to separate public fill from C&D waste for disposal at appropriate facilities. We will record the disposal, reuse and recycling of C&D materials for monitoring purposes. We estimate that the volume of C&D materials to be generated by each proposed project to be as follows -

Project no.	Total C&D materials generated	C&D materials reused/recycled at site		Inert C&D materials to public filling areas[4]		Organic materials to landfills	
	m^3	m^3	%	m^3	%	m^3	%
239ES	3 250	2 100	64.6	650	20.0	500	15.4
284EP	2 900	1 850	63.8	600	20.7	450	15.5
293EP	2 900	1 850	63.8	600	20.7	450	15.5

The notional cost of accommodating C&D waste at landfill sites is estimated to be $62,500 for **239ES** and $56,250 each for **284EP** and **293EP** (based on a notional unit cost[5] of $125/$m^3$).

LAND ACQUISITION

19. **239ES** and **293EP** do not require land acquisition. Part of the school site for **284EP** is agricultural land (about 512 square metres) and is held under private ownership. We expect to complete land resumption formalities for this part of the site by January 2002. The clearance will not affect any household. We will charge the land acquisition and clearance costs, estimated to be $3.2 million, to **Head 701 - Land Acquisition**.

/**BACKGROUND** …..

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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 landfill 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 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

20. We upgraded **239ES**, **284EP** and **293EP** to Category B in July 2000, September 2000 and September 2001 respectively. We engaged consultants to carry out PERs and topographical surveys and employed term contractors to carry out site investigations for the three projects at the following dates and costs -

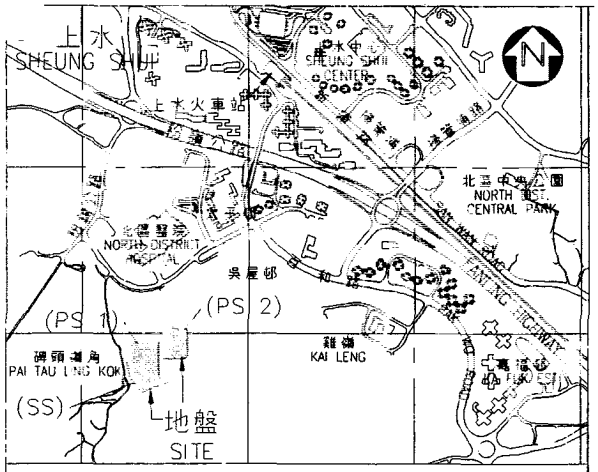
Project no.	PER	Topographical survey	Site investigation	Total cost
239ES	November 1999	March 2001	February 2001	$738,000
284EP	November 1999	March 2001	March 2001	$688,000
293EP	August 2000	March 2001	February 2001	$699,000

We charged these amounts to block allocation **Subhead 3100GX** "Project feasibility studies, minor investigations and consultants' fees for items in Category D of the Public Works Programme". The consultants and the term contractors have completed the PERs, topographical surveys and site investigations respectively. D Arch S has completed detailed designs and tender documents of the projects using in-house staff resources.

21. We estimate that the proposed works will create the following job opportunities during the construction period -

Project no.	Professional staff	Technical staff	Labourer	Total no. of staff	Total man-months
239ES	3	7	150	160	2 720
284EP	3	7	125	135	2 350
293EP	3	7	125	135	2 350

Education and Manpower Bureau
October 2001

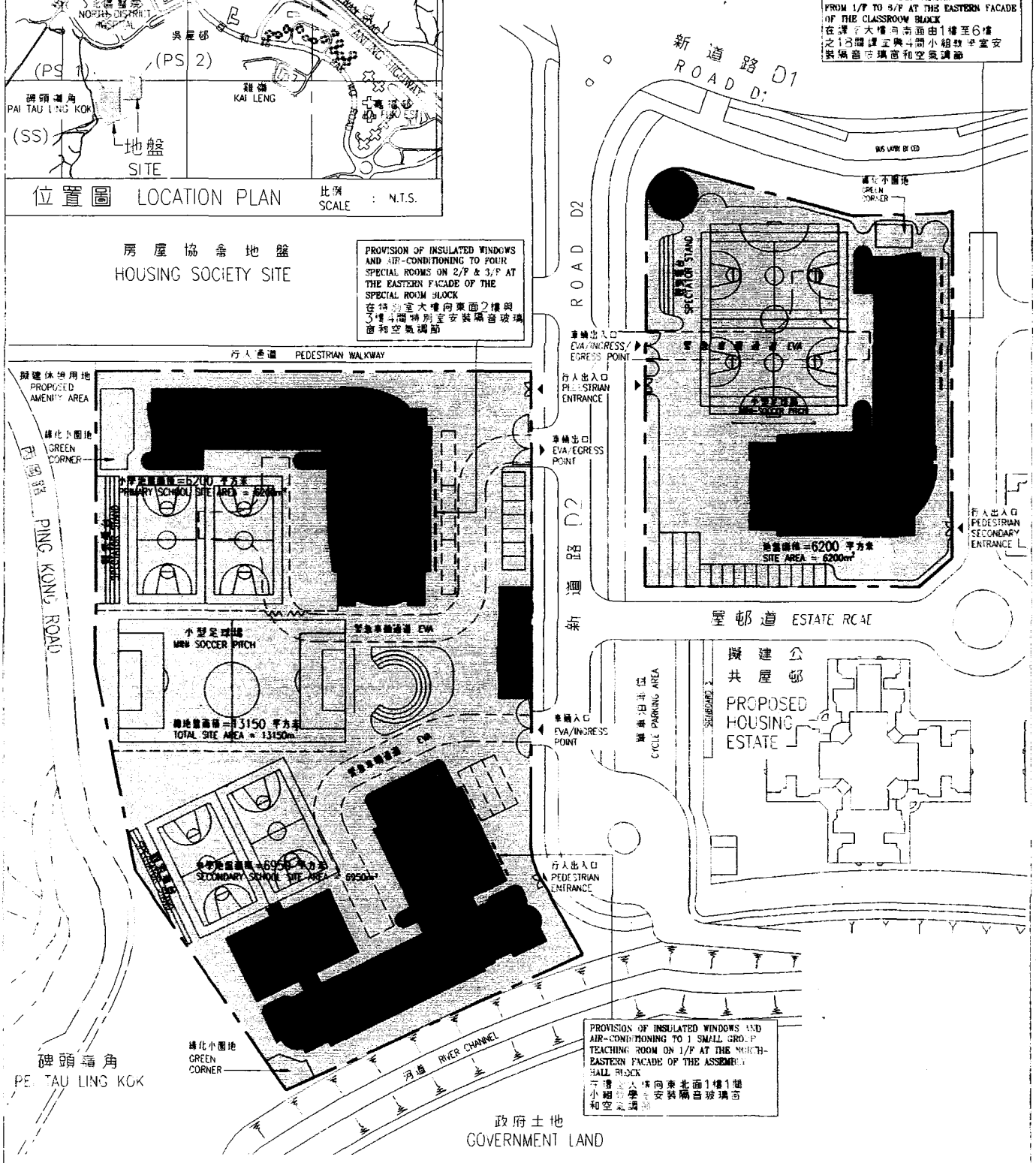


位置圖 LOCATION PLAN 比例 SCALE : N.T.S.

房屋協會地盤
HOUSING SOCIETY SITE

PROVISION OF INSULATED WINDOWS AND AIR-CONDITIONING TO 18 CLASSROOMS AND 4 SMALL GROUP TEACHING ROOMS FROM 1/F TO 5/F AT THE EASTERN FACADE OF THE CLASSROOM BLOCK
在課室大樓向東面由1樓至6樓之18間課室與4間小組教學室安裝隔音玻璃窗和空氣調節

PROVISION OF INSULATED WINDOWS AND AIR-CONDITIONING TO FOUR SPECIAL ROOMS ON 2/F & 3/F AT THE EASTERN FACADE OF THE SPECIAL ROOM BLOCK
在特別室大樓向東面2樓與3樓共四間特別室安裝隔音玻璃窗和空氣調節



PROVISION OF INSULATED WINDOWS AND AIR-CONDITIONING TO 1 SMALL GROUP TEACHING ROOM ON 1/F AT THE NORTH-EASTERN FACADE OF THE ASSEMBLY HALL BLOCK
禮堂大樓向東北面1樓1間小組教學室安裝隔音玻璃窗和空氣調節

title (239ES, 284EP & 293EP) 粉嶺36區1所中學及2所小學 ONE SECONDARY SCHOOL & TWO PRIAMRY SCHOOLS IN AREA 36, FANLING	drawn by GAVIN AU	date 09/2001	drawing no. AB/5696&5708&6356/XA101	scale 1:1250
	approved ERIC CHEUNG	date 09/2001		
	office ARCHITECTURAL BRANCH		ARCHITECTURAL SERVICES DEPARTMENT	
GRP. DIV. SCHOOL			A4 210 x 297	

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Enclosure 2 to PWSC(2001-02)59

A comparison of the reference cost of a secondary school project with the estimated cost of 239ES

$ million (in Sept 2001 prices)

		Reference cost*	239ES	
(a)	Piling	11.0	15.3	(See note A)
(b)	Building	54.9	54.9	
(c)	Building services	14.3	14.4	(See note B)
(d)	Drainage and external works	10.5	10.5	
(e)	Contingencies	9.0	9.5	
	Total	99.7	104.6	
(f)	Construction floor area	12 238m^2	12 238m^2	
(g)	Construction unit cost {[(b) + (c)] ÷ (f)}	$5,655/$m^2$	$5,663/$m^2$	

*** Assumptions for reference cost**

1. The estimation is based on the assumption that the school site is uncomplicated and without unusual environmental restrictions. No allowance is reserved for specific environmental restrictions such as the provision of insulated windows, air-conditioning and solid boundary walls to mitigate noise impacts on the school.

2. No site formation works/geotechnical works are required as they are normally carried out by other government departments under a separate engineering vote before handing over the project site for school construction.

3. Piling cost is based on the use of 138 numbers of steel H-piles at an average depth of 30 metres, on the assumption that percussive piling is permissible. It also includes costs for pile caps, strap beams and testing. No allowance is reserved for the effect of negative skin friction due to fill on reclaimed land.

4. Cost for drainage and external works is for a secondary school site area of 6 950 square metres built on an average level site without complicated geotechnical conditions, utility diversions, etc. (i.e. a "green-field" site).

5. No consultancy services are required.

6. Furniture and equipment costs are excluded as they are usually borne by the sponsoring bodies of new schools.

7. The reference cost for comparison purpose is subject to review regularly. D Arch S will review, and revise if necessary, the reference cost which should be adopted for future projects.

Notes

A. The piling cost is higher because it is based on the use of 134 numbers of rock socketed steel H-piles in prebored holes at an average depth of 40 metres instead of 138 numbers of steel H-piles at an average depth of 30 metres assumed for the reference cost. The former method, though more expensive, is appropriate for driving the piles through a layer of extensive large boulders. Longer piles are also required to suit the bedrock level.

B. The building services cost is higher because of the provision of air-conditioning as a noise mitigation measure.

Enclosure 3 to PWSC(2001-02)59

A comparison of the reference cost of a 30-classroom primary school project with the estimated cost of 284EP and 293EP

$ million (in Sept 2001 prices)

		Reference cost*	284EP	293EP	
(a)	Site formation	-	0.8	-	(See note A)
(b)	Piling	9.0	12.3	12.3	(See note B)
(c)	Building	45.3	45.3	45.3	
(d)	Building services	11.9	12.4	13.6	(See note C)
(e)	Drainage and external works	9.5	9.5	9.5	
(f)	Furniture and equipment	-	4.5	4.5	(See note D)
(g)	Contingencies	7.5	8.0	8.1	
	Total	83.2	92.8	93.3	
(h)	Construction floor area	10 727m^2	10 727m^2	10 727m^2	
(i)	Construction unit cost {[(c) + (d)] ÷ (h)}	\$5,332/m^2	\$5,379/m^2	\$5,491/m^2	

* Assumptions for reference cost

1. The estimation is based on the assumption that the school site is uncomplicated and without unusual environmental restrictions. No allowance is reserved for specific environmental restrictions such as the provision of insulated windows, air-conditioning and solid boundary walls to mitigate noise impacts on the school.

2. No site formation works/geotechnical works are required as they are normally carried out by other government departments under a separate engineering vote before handing over the project site for school construction.

3. Piling cost is based on the use of 112 numbers of steel H-piles at an average depth of 30 metres, on the assumption that percussive piling is permissible. It also includes costs for pile caps, strap beams and testing. No allowance is reserved for the effect of negative skin friction due to fill on reclaimed land.

4. Cost for drainage and external works is for a standard 30-classroom primary school site area of 6 200 square metres built on an average level site without complicated geotechnical conditions, utility diversions, etc. (i.e. a "green-field" site).

5. No consultancy services are required.

6. Furniture and equipment costs are excluded as they are usually borne by the sponsoring bodies of new schools.

7. The reference cost for comparison purpose is subject to review regularly. D Arch S will review, and revise if necessary, the reference cost which should be adopted for future projects.

Notes

A. For **284EP**, the cost of site formation is necessary for leveling off the site to the required level.

B. For both **284EP** and **293EP**, the piling cost is higher because it is based on the use of 108 numbers of rock socketed steel H-piles in prebored holes at an average depth of 40 metres instead of 112 numbers of steel H-piles at an average depth of 30 metres assumed for the reference cost. The former method, though more expensive, is appropriate for driving the piles through a layer of extensive large boulders. Longer piles are also required to suit the bedrock level.

C. For both **284EP** and **293EP**, the building services cost is higher because of the provision of air-conditioning as a noise mitigation measure.

D. For both **284EP** and **293EP**, the cost of furniture and equipment, estimated to be $4.5 million each, will be borne by Government as the schools will be allocated to existing bi-sessional schools for conversion to whole-day operation.