For discussion **PWSC(2001-02)71**
on 14 November 2001

ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

HEAD 703 - BUILDINGS
Education - Secondary
243ES - Two secondary schools in Area 73A, Tseung Kwan O

Education - Primary
295EP - Primary school in Area 73A, Tseung Kwan O

Members are invited to recommend to Finance Committee the upgrading of **243ES** and **295EP** to Category A at an estimated cost of $197.6 million and $86.8 million respectively in money-of-the-day prices for the construction of two secondary schools and one 30-classroom primary school in Area 73A, Tseung Kwan O.

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

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 $284.4 million in money-of-the-day (MOD) prices -

/(a) …..

		Project estimate $ million (MOD)
(a)	**243ES** - Two secondary schools in Area 73A, Tseung Kwan O	197.6
(b)	**295EP** - Primary school in Area 73A, Tseung Kwan O	86.8
	Total	284.4

PROJECT SCOPE AND NATURE

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

		(Secondary schools) 243ES		**(Primary school) 295EP**
		(Sch 1)	**(Sch 2)**	
(a)	classrooms;	30	30	30
(b)	special rooms, including a computer-assisted learning room and a language room;	16	16	6
(c)	small group teaching rooms;	3	3	4
(d)	guidance activity room;	1	1	1
(e)	interview rooms;	2	2	2
(f)	staff room;	1	1	1
(g)	staff common room;	1	1	1
(h)	student activity centre;	1	1	1
(i)	conference room;	1	1	1

/(j) ….

		(Secondary schools) 243ES (Sch 1)	(Secondary schools) 243ES (Sch 2)	(Primary school) 295EP
(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 one on ground level and one on the rooftop of the assembly block);	2	2	2
(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 cum sports field; and

(q) a spectator stand with cover.

The three proposed 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. D Arch S plans to start construction works for **243ES** and **295EP** in April 2002 for completion in November 2003.

/JUSTIFICATION …..

[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.

JUSTIFICATION

243ES - Two secondary schools in Area 73A, Tseung Kwan O

4. The Director of Education (D of E) forecasts that 290 additional secondary school classes will be required in the territory by the school year 2003/04 to meet the increase in demand for new places. To date, eight new schools providing a total of 240 classrooms have been recommended by this Subcommittee for upgrading to Category A[2]. **243ES**, providing a total of 60 classrooms, will meet the remaining shortfall.

295EP - Primary school in Area 73A, Tseung Kwan O

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 the remaining 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, we require another 46 new schools between the 2003/04 and the 2007/08 school years. To date, nine new schools have already been upgraded to Category A. Another five have been recommended by this Subcommittee for upgrading[3]. **295EP** will help achieve this policy target.

7. Sai Kung District, in which **295EP** is located, currently has 25 public sector primary schools providing 656 classrooms. D of E forecasts that an additional 133 classrooms will be required for full implementation of whole-day primary schooling by the 2007/08 school year. **295EP** will help to reduce the shortfall by 30 classrooms to 103 and will enable an existing bi-sessional primary school to convert into whole-day operation. We plan to meet the projected shortfall through further school construction projects.

/**FINANCIAL** …..

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[2] The eight secondary schools are under **232ES**, **233ES**, **239ES**, **240ES**, **241ES** and **242ES**.

[3] The five primary schools are under **279EP**, **284EP**, **288EP**, **292EP** and **293EP**.

FINANCIAL IMPLICATIONS

8. We estimate the capital cost of **243ES** and **295EP** to be $197.6 million and $86.8 million respectively in MOD prices (see paragraph 10 below), made up as follows -

	$ million				
	243ES			**295EP**	
	(Sch 1)	**(Sch 2)**	**Total**		
(a) Piling	4.0	11.0	15.0	4.0	
(b) Building	54.9	54.9	109.8	45.3	
(c) Building services	17.8	14.4	32.2	14.3	
(d) Drainage and external works	10.5	11.5	22.0	10.8	
(e) Furniture and equipment[4]	-	-	-	4.5	
(f) Contingencies	8.7	9.1	17.8	7.4	
Sub-total	95.9	100.9	196.8	86.3	(in September 2001 prices)
(g) Provision for price adjustment	0.4	0.4	0.8	0.5	
Total	96.3	101.3	197.6	86.8	(in MOD prices)

9. The respective estimated construction unit cost for **243ES** and **295EP** in September 2001 prices, represented by building and building services costs, are as follows -

/**Project** …..

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[4] 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 $
243ES (Sch 1)	12 238	5,941
243ES (Sch 2)	12 238	5,663
295EP	10 727	5,556

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 costs for **243ES** is at Enclosure 2. A similar comparison between a 30-classroom primary school and **295EP** is at Enclosure 3.

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

Year	$ million (September 2001)				Price adjustment factor	$ million (MOD)			
	243ES (Sch 1)	243ES (Sch 2)	243ES Total	295EP		243ES (Sch 1)	243ES (Sch 2)	243ES Total	295EP
2002 - 03	27.9	31.4	59.3	28.6	0.99700	27.8	31.3	59.1	28.5
2003 - 04	47.0	49.5	96.5	38.0	1.00398	47.2	49.7	96.9	38.2
2004 - 05	17.0	16.0	33.0	13.7	1.01101	17.2	16.2	33.4	13.9
2005 - 06	2.0	2.0	4.0	3.0	1.01808	2.0	2.0	4.0	3.1
2006 - 07	2.0	2.0	4.0	3.0	1.02521	2.1	2.1	4.2	3.1
	95.9	100.9	196.8	86.3		96.3	101.3	197.6	86.8

11. We derived the MOD estimates on the basis of Government's latest forecast of trend labour and construction prices for the period 2002 to 2007. We will deliver the works through a fixed-price lump-sum contract because the contract period will be less than 21 months and we can clearly define the scope of works in advance, leaving little room for uncertainty.

/12. …..

12. The cost of furniture and equipment[5], estimated to be $9.4 million for each school under **243ES**, will be borne by the school sponsors as the schools will meet increase in demand for school places. For **295EP**, the cost of furniture and equipment, estimated to be $4.5 million, will be borne by the Government as the school will enable an existing bi-sessional school to convert into whole-day operation. These are in line with existing policies.

13. We estimate the annual recurrent expenditure for each school under **243ES** to be around $41.0 million and that for **295EP** to be around $22.4 million.

PUBLIC CONSULTATION

14. We consulted the Sai Kung District Council in August 2001. Members of the Council supported the projects.

ENVIRONMENTAL IMPLICATIONS

15. We engaged a consultant to conduct a Preliminary Environmental Review (PER) for **243ES** and **295EP** in January 2001. The PER 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 -

Project no.	**Mitigation measures**	**Estimated cost $ million (in Sept 2001 prices)**
243ES (Sch 1)	(a) Provision of insulated windows and air-conditioning to 30 classrooms and one small group teaching room from the 1/F to the 6/F at the western façade of the classroom block	3.5
243ES (Sch 2)	(b) Construction of a 3-metre high boundary wall at the southern side of the school	1.0
	(c) Provision of insulated windows and	0.1

/**Project** …..

[5] 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)
	air-conditioning to one classroom on the 5/F at the southern façade of the classroom block	
295EP	(d) Construction of a 3-metre high boundary wall at the southern and western sides of the school	1.3
	(e) Provision of insulated windows and air-conditioning to 20 classrooms and three small group teaching rooms from the 3/F to the 6/F of the western façade of the classroom block; and two special rooms on the 3/F at the southern façade of the assembly hall block	2.4

We have included the costs of these mitigation measures as part of the building services works as well as drainage and external works in the respective project estimates.

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 project 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 contractor 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 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. D Arch S will ensure that the day-to-day operations on site comply with the approved WMP. 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 contractor 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 projects 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[6]		Organic materials to landfills	
	m^3	m^3	%	m^3	%	m^3	%
243ES	6 500	4 200	64.6	1 300	20.0	1 000	15.4
295EP	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 $125,000 for **243ES** and $56,250 for **295EP** (based on a notional unit cost[7] of $125/$m^3$).

LAND ACQUISITION

19. The projects do not require land acquisition.

BACKGROUND INFORMATION

20. We upgraded **243ES** and **295EP** to Category B in August 2001. We engaged a consultant to carry out a PER and employed a term contractor to carry out site investigation for the two projects at the following dates and costs -

/**Project** …..

Project no.	PER	Site investigation	Total cost
243ES	January 2001	June 2001	$1,520,000

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[6] 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.

[7] 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 $90 per/$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.

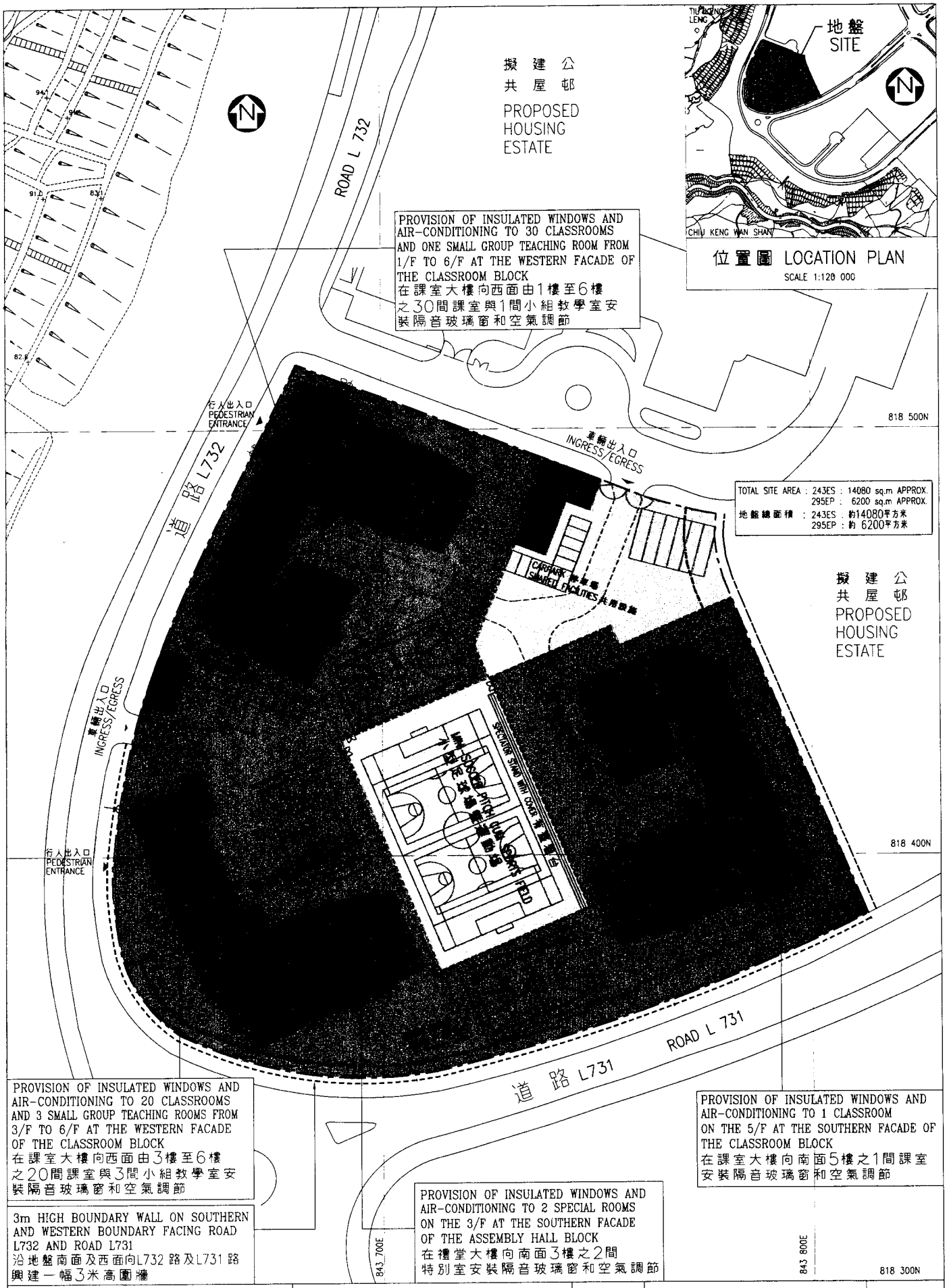
295EP	January 2001	June 2001	$710,000

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 consultant and the term contractor have completed the PER and site investigation respectively. D Arch S has completed detailed designs of the projects and is preparing the tender documents 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
243ES	3	12	285	300	5 150
295EP	2	5	113	120	2 100

Education and Manpower Bureau
November 2001



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A comparison of the reference cost of a secondary school project with the estimated cost of 243ES

$ million (in Sept 2001 prices)

		Reference cost*	243ES (Sch 1)	243ES (Sch 2)	
(a)	Piling	11.0	4.0	11.0	(See note A)
(b)	Building	54.9	54.9	54.9	
(c)	Building services	14.3	17.8	14.4	(See note B)
(d)	Drainage and external works	10.5	10.5	11.5	(See note C)
(e)	Contingencies	9.0	8.7	9.1	
	Total	99.7	95.9	100.9	
(f)	Construction floor area	12 238 m^2	12 238 m^2	12 238 m^2	
(g)	Construction unit cost {[(b) + (c)] ÷ (f)}	\$5,655/m^2	\$5,941/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 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. For school 1, the piling cost is lower because the rock head is close to the surface which allows the use of footing foundations instead of piling.

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

C. For school 2, the drainage and external works cost is higher because of the construction of a 3-metre high boundary wall as a noise mitigation measure.

Enclosure 3 to PWSC(2001-02)71

A comparison of the reference cost of a 30-classroom primary school project with the estimated cost of 295EP

		$ million (in Sept 2001 prices)		
		Reference cost*	**295EP**	
(a)	Piling	9.0	4.0	(See note A)
(b)	Building	45.3	45.3	
(c)	Building services	11.9	14.3	(See note B)
(d)	Drainage and external works	9.5	10.8	(See note C)
(e)	Furniture and equipment	-	4.5	(See note D)
(f)	Contingencies	7.5	7.4	
	Total	83.2	86.3	
(g)	Construction floor area	10 727 m^2	10 727 m^2	
(h)	Construction unit cost {[(b) + (c)] ÷ (g)}	\$5,332/m^2	\$5,556/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 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. The piling cost is lower because the rock head is close to the surface which allows the use of footing foundations instead of piling.

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

C. The drainage and external works costs are higher because of the construction of a 3-metre high boundary wall as a noise mitigation measure.

D. The cost of furniture and equipment, estimated to be $4.5 million, will be borne by Government as the school will be allocated to existing bi-sessional school for conversion to whole-day operation.