

**For discussion  
on 17 April 2002**

**PWSC(2002-03)13**

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

### **HEAD 703 – BUILDINGS**

#### **Education – Secondary**

**247ES – Secondary school in Area 13, Tseung Kwan O**

**248ES – Second secondary school in Area 13, Tseung Kwan O**

#### **Education – Primary**

**303EP – Primary school in Area 13, Tseung Kwan O**

Members are invited to recommend to Finance Committee the upgrading of **247ES**, **248ES** and **303EP** to Category A at an estimated cost of \$92.3 million, \$89.8 million and \$83.8 million respectively in money-of-the-day prices for the construction of two secondary schools and one 30-classroom primary school in Area 13, 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 2004/05. 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 \$265.9 million in money-of-the-day (MOD) prices –

	<b>Project estimate \$ million (MOD)</b>
(a) <b>247ES</b> – Secondary school in Area 13, Tseung Kwan O	92.3
(b) <b>248ES</b> – Second secondary school in Area 13, Tseung Kwan O	89.8
(c) <b>303EP</b> – Primary school in Area 13, Tseung Kwan O	83.8
Total	265.9

**PROJECT SCOPE AND NATURE**

3. The three proposed schools, comprising two secondary schools and one 30-classroom primary school, are located in Area 13, Tseung Kwan O. The facilities for the three schools will include –

	<b>(Secondary schools)</b>		<b>(Primary school)</b>
	<b>247ES</b>	<b>248ES</b>	<b>303EP</b>
(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	/(e) ..... 2

	(Secondary schools)		(Primary school)
	247ES	248ES	303EP
(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) 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 (one on ground level and one on the rooftop of the assembly block);	2	2	2
(n) green corner <sup>1</sup> ;	1	1	1
(o) ancillary accommodation including a lift and relevant facilities for the handicapped; and	Available	Available	Available

### Shared facilities

(p) a mini-soccer pitch-cum-two basketball courts.

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The three proposed schools will all meet the planning target of providing two square metres of open space per student. A site plan is at Enclosure 1. D Arch S

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<sup>1</sup> 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.

plans to start construction works for the three projects in November 2002 for completion in July 2004.

## JUSTIFICATION

*247ES – Secondary school in Area 13, Tseung Kwan O*

*248ES – Second secondary school in Area 13, Tseung Kwan O*

4. The Director of Education (D of E) forecasts that 369 additional secondary school classes will be required in the territory by the school year 2004/05 to meet the increase in demand for new places. The proposed two secondary schools will provide a total of 60 classrooms, and together with another two projects **230ES** and **246ES** which will also be considered by Members at this meeting (see paper referenced PWSC(2002-03)12), the shortfall of secondary school classes will be reduced to 249 classrooms. We plan to meet the projected shortfall through further school construction projects.

*303EP – Primary school in Area 13, 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, 55 schools have already been completed, and the remaining 23 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, 15 projects have already been upgraded to Category A. **303EP** will help achieve this policy target.

7. Sai Kung District, in which **303EP** is located, currently has 25 public sector primary schools providing 650 classrooms. D of E forecasts that an additional 109 classrooms will be required for full implementation of whole-day primary schooling by the 2007/08 school year. **303EP** will help to reduce the shortfall by 30 classrooms to 79 and will enable an existing bi-sessional primary school to convert into whole-day operation. We plan to meet the remaining shortfall in this district through further school construction projects.

/FINANCIAL .....

**FINANCIAL IMPLICATIONS**

8. We estimate the capital cost of **247ES**, **248ES** and **303EP** to be \$92.3 million, \$89.8 million and \$83.8 million respectively in MOD prices (see paragraph 10 below), made up as follows –

	<b>\$ million</b>			
	<b>247ES</b>	<b>248ES</b>	<b>303EP</b>	
(a) Piling	9.0	9.0	7.5	
(b) Building	50.2	50.2	41.3	
(c) Building services	15.5	13.0	14.5	
(d) Drainage and external works	10.5	10.7	10.0	
(e) Furniture and equipment <sup>2</sup>	–	–	4.5	
(f) Contingencies	8.5	8.3	7.3	
Sub-total	93.7	91.2	85.1	(in September 2001 prices)
(g) Provision for price adjustment	(1.4)	(1.4)	(1.3)	
Total	92.3	89.8	83.8	(in MOD prices)

9. The respective estimated construction unit costs for **247ES**, **248ES** and **303EP** in September 2001 prices, represented by building and building services costs, are as follows –

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<sup>2</sup> Based on a standard furniture and equipment list prepared by Education Department for “Year 2000 design” school.

<b>Project no.</b>	<b>Construction floor area (CFA) m<sup>2</sup></b>	<b>Estimated construction unit cost per m<sup>2</sup> of CFA \$</b>
<b>247ES</b>	12 238	5,369
<b>248ES</b>	12 238	5,164
<b>303EP</b>	10 727	5,202

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 **247ES** and **248ES** is at Enclosure 2. A similar comparison between a 30-classroom primary school and **303EP** is at Enclosure 3.

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

<b>Year</b>	<b>\$ million (September 2001)</b>			<b>Price adjustment factor</b>	<b>\$ million (MOD)</b>		
	<b>247ES</b>	<b>248ES</b>	<b>303EP</b>		<b>247ES</b>	<b>248ES</b>	<b>303EP</b>
2002 – 03	6.0	6.0	5.0	0.98625	5.9	5.9	4.9
2003 – 04	39.1	38.1	35.2	0.98378	38.5	37.5	34.6
2004 – 05	40.0	38.5	33.3	0.98378	39.4	37.9	32.8
2005 – 06	6.6	6.6	8.6	0.98378	6.5	6.5	8.5
2006 – 07	2.0	2.0	3.0	0.98378	2.0	2.0	3.0
	<u>93.7</u>	<u>91.2</u>	<u>85.1</u>		<u>92.3</u>	<u>89.8</u>	<u>83.8</u>

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. The cost of furniture and equipment<sup>3</sup>, estimated to be \$9.4 million each for **247ES** and **248ES**, will be borne by the school sponsors as the schools will meet increase in demand for school places. For **303EP**, the cost of furniture and equipment, estimated to be \$4.5 million, will be borne by the Government as the school will enable 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 **247ES** and **248ES** to be \$40.9 million each and that for **303EP** to be \$22.2 million.

## PUBLIC CONSULTATION

14. We consulted the Sai Kung District Council on the three projects in January 2002. Members of the Council supported the projects.

## ENVIRONMENTAL IMPLICATIONS

15. We engaged a consultant to conduct a Preliminary Environmental Review (PER) for **247ES**, **248ES** and **303EP** in March 2002. 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)
<b>247ES</b>	(a) Provision of insulated windows and air-conditioning to three special rooms from the 4/F to 6/F at the southern façade of the special room block	0.4
	(b) Provision of insulated windows and air-conditioning to 23 classrooms and one small group teaching room from the 2/F to 6/F at the western façade of the classroom block	2.3
<b>248ES</b>	(c) Provision of insulated windows and air-	/248ES ..... 0.2

<sup>3</sup> 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)
	conditioning to one special room and one small group teaching room on the 1/F at the northern façade of the special room block	
	(d) Construction of a 3-metre high boundary wall along the northern boundary facing Po Hong Road	0.2
<b>303EP</b>	(e) Provision of insulated windows and air-conditioning to 30 classrooms and four small group teaching rooms from the 1/F to 6/F at the northern façade of the classroom block	3.0
	(f) Provision of insulated windows and air-conditioning to four special rooms from the 2/F to 3/F at the western façade of the special room block	0.5
	(g) Construction of a 3-metre high boundary wall along the northern boundary facing Po Hong Road	0.5

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. 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		C&D materials to public filling areas <sup>4</sup>		C&D materials to landfills	
	m <sup>3</sup>	m <sup>3</sup>	%	m <sup>3</sup>	%	m <sup>3</sup>	%
<b>247ES</b>	3 250	2 100	64.6	650	20.0	500	15.4
<b>248ES</b>	3 250	2 100	64.6	650	20.0	500	15.4
<b>303EP</b>	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 each for **247ES** and **248ES** and \$56,250 for **303EP** (based on a notional unit cost<sup>5</sup> of \$125/m<sup>3</sup>).

/LAND .....

<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 per/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.

**LAND ACQUISITION**

19. The projects do not require land acquisition.

**BACKGROUND INFORMATION**

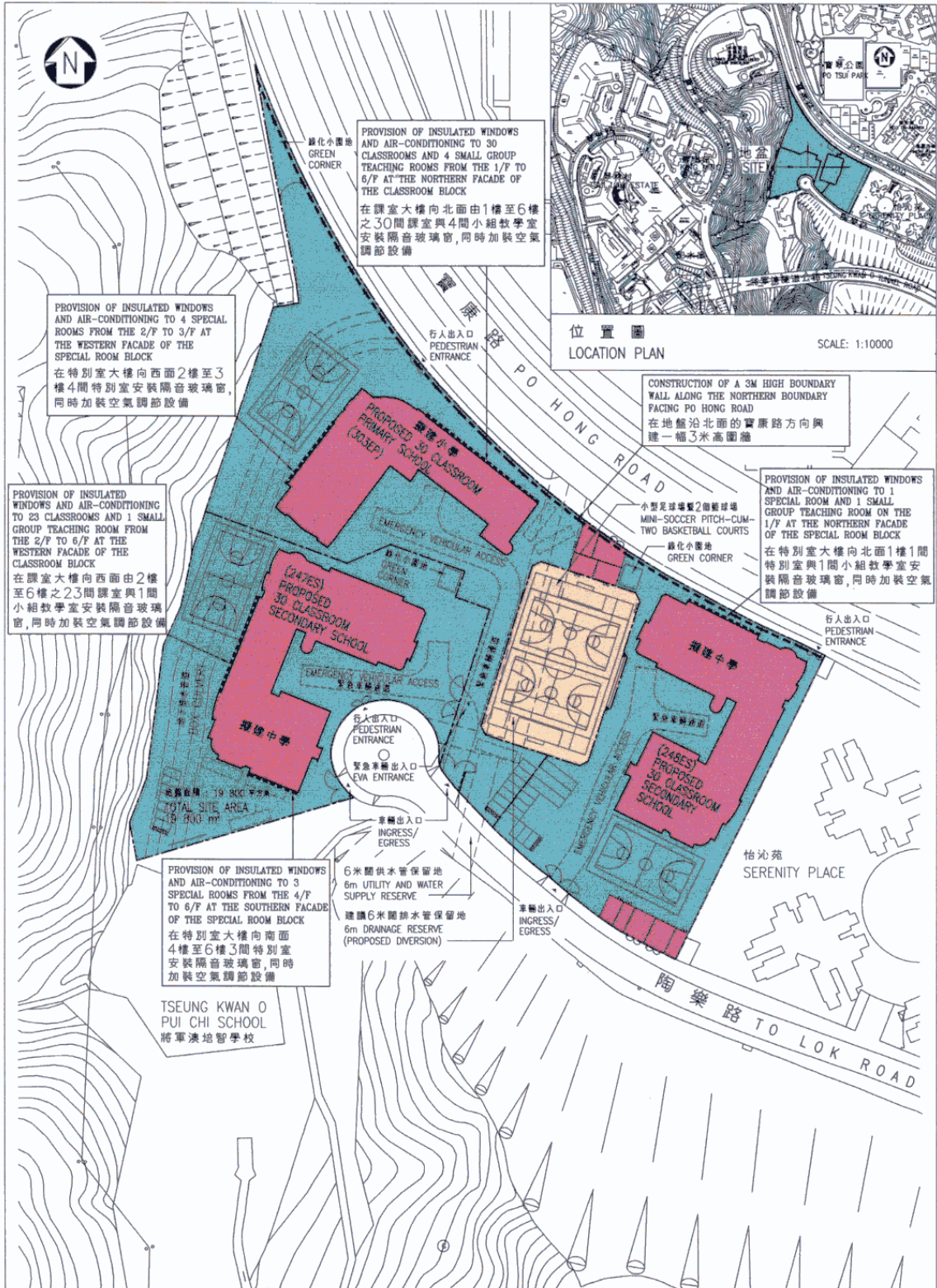
20. We upgraded **247ES**, **248ES** and **303EP** to Category B in March 2002. We engaged a consultant to carry out a PER and employed a term contractor to carry out site investigation and topographical survey for the three projects at the following dates and costs –


<b>Project no.</b>	<b>PER</b>	<b>Site investigation</b>	<b>Topographical survey</b>	<b>Total cost \$</b>
<b>247ES</b>	March 2002	March 2002	December 2001	960,000
<b>248ES</b>	March 2002	March 2002	December 2001	960,000
<b>303EP</b>	March 2002	March 2002	December 2001	810,000

We will charge 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 topographical survey respectively. The term contractor is carrying out site investigation which will be completed in early May 2002. D Arch S has completed detailed designs of the projects and is preparing the tender documents with in-house staff resources.

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

<b>Project no.</b>	<b>Professional staff</b>	<b>Technical staff</b>	<b>Labourer</b>	<b>Total no. of staff</b>	<b>Total man-months</b>
<b>247ES</b>	2	4	114	120	2 250
<b>248ES</b>	2	4	109	115	2 170
<b>303EP</b>	2	4	104	110	2 120



title 247ES, 248ES & 303EP 將軍澳第13區的2所中學及1所小學 TWO SECONDARY SCHOOLS AND ONE PRIMARY SCHOOL IN AREA 13, TSEUNG KWAN O	drawn by EMIL Y.K. CHOI	date 21.03.02	drawing no. AB/6515/XD101	scale 1:1500
	approved ERIC C.W. CHEUNG	date 21.03.02	 ARCHITECTURAL SERVICES DEPARTMENT	
	office ARCHITECTURAL BRANCH			

**A comparison of the reference cost of  
a secondary school project  
with the estimated costs of 247ES and 248ES**

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

	<b>Reference cost*</b>	<b>247ES</b>	<b>248ES</b>	
(a) Piling	11.0	9.0	9.0	(See note A)
(b) Building	54.9	50.2	50.2	(See note B)
(c) Building services	14.3	15.5	13.0	(See note C)
(d) Drainage and external works	10.5	10.5	10.7	(See note D)
(e) Contingencies	9.0	8.5	8.3	
	99.7	93.7	91.2	
	99.7	93.7	91.2	
(f) Construction floor area	12 238 m <sup>2</sup>	12 238 m <sup>2</sup>	12 238 m <sup>2</sup>	
(g) Construction unit cost {[(b) + (c)] ÷ (f)}	\$5,655/m <sup>2</sup>	\$5,369/m <sup>2</sup>	\$5,164/m <sup>2</sup>	

**\* 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 both **247ES** and **248ES**, the estimated piling cost is lower taking into account lower tender returns for schools in the last two quarters.
- B. For both **247ES** and **248ES**, the estimated building cost is lower taking into account lower tender returns for schools in the last two quarters.
- C. For **247ES**, the building services cost is higher because of the provision of air-conditioning as a noise mitigation measure. Lower tender returns for schools in the last two quarters have also been accounted for.  
  
For **248ES**, the estimated building services cost is lower taking into account lower tender returns for schools in the last two quarters.
- D. For **248ES**, the drainage and external works costs are higher because of the construction of a 3-metre high boundary wall as a noise mitigation measure.

**A comparison of the reference cost of  
a 30-classroom primary school project  
with the estimated cost of 303EP**

\$ million (in Sept 2001 prices)				
		Reference cost*	303EP	
(a)	Piling	9.0	7.5	(See note A)
(b)	Building	45.3	41.3	(See note B)
(c)	Building services	11.9	14.5	(See note C)
(d)	Drainage and external works	9.5	10.0	(See note D)
(e)	Furniture and equipment	–	4.5	(See note E)
(f)	Contingencies	7.5	7.3	
	Total	83.2	85.1	
(g)	Construction floor area	10 727 m <sup>2</sup>	10 727 m <sup>2</sup>	
(h)	Construction unit cost {[(b) + (c)] ÷ (g)}	\$5,332/m <sup>2</sup>	\$5,202/m <sup>2</sup>	

\* **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 estimated piling cost is lower taking into account lower tender returns for schools in the last two quarters.
- B. The estimated building cost is lower taking into account lower tender returns for schools in the last two quarters.
- C. The building services cost is higher because of the provision of air-conditioning as a noise mitigation measure. Lower tender returns for schools in the last two quarters have also been accounted for.
- D. The drainage and external works costs are higher because of the construction of a 3-metre high boundary wall as a noise mitigation measure.
- E. The cost of furniture and equipment, estimated to be \$4.5 million, will be borne by Government as the school will be allocated to an existing bi-sessional school for conversion to whole-day operation.