

## ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

### HEAD 703 – BUILDINGS

#### Education – Secondary

#### 245ES – Secondary school in Area 31, Sheung Shui

#### Education – Primary

#### 302EP – Primary school in Area 31, Sheung Shui

Members are invited to recommend to Finance Committee the upgrading of **245ES** and **302EP** to Category A at an estimated cost of \$119.2 million and \$98.4 million respectively in money-of-the-day prices for the construction of a secondary school and a primary school in Area 31, Sheung Shui.

### PROBLEM

We do not have enough secondary schools to meet the increase in demand for new school places by the 2007/08 school year. We also do not have enough 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 (SEM), proposes to upgrade the following projects to Category A at an estimated total cost of \$217.6 million in money-of-the-day (MOD) prices –

	<b>Project estimate \$ million (MOD)</b>
(a) <b>245ES</b> – Secondary school in Area 31, Sheung Shui	119.2
(b) <b>302EP</b> – Primary school in Area 31, Sheung Shui	98.4
Total	<hr/> 217.6 <hr/>

### PROJECT SCOPE AND NATURE

3. The two proposed schools are located in Area 31, Sheung Shui. The facilities for the two schools will include –

	<b>245ES</b>	<b>302EP</b>
(a) classrooms	30	30
(b) special rooms, including a computer-assisted learning room and a language room	16	6
(c) small group teaching rooms	3	4
(d) guidance activity room	1	1
(e) interview rooms	2	2
(f) staff room	1	1
(g) staff common room	1	1
(h) student activity centre	1	1
(i) conference room	1	1
(j) library	1	1

	<b>245ES</b>	<b>302EP</b>
(k) assembly hall (which can be used for a wide range of physical activities such as badminton, gymnastics and table-tennis)	1	1
(l) multi-purpose area	1	1
(m) basketball courts at ground level	2	2
(n) green corner <sup>1</sup>	1	1
(o) ancillary accommodation, including a lift and relevant facilities for the handicapped	Available	Available

Both projects will meet the planning target of providing two square metres of open space per student. A site plan for **245ES** and **302EP** is at Enclosure 1 and computer rendered drawing of the school premises is at Enclosure 2. D Arch S plans to start the construction works for both projects in July 2004 for completion in July 2006.

## JUSTIFICATION

### *245ES – Secondary school in Area 31, Sheung Shui*

4. SEM forecasts that 423 additional secondary school classes will be required in the territory between the 2004/05 and 2007/08 school years to meet the increase in demand for new school places. To date, Finance Committee has approved funding for nine new schools providing 222 classrooms. **245ES**, which has yet to be allocated to a school sponsor, will provide 30 classrooms. We plan to meet the rest of the projected shortfall through further school construction projects.

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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.

***302EP – Primary school in Area 31, Sheung Shui***

5. The Government has achieved the interim target of enabling 60% of our primary school students to study in whole-day schools in the 2002/03 school year. 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, SEM plans to construct another 65 new schools<sup>2</sup> between the 2003/04 and 2007/08 school years. To date, Finance Committee has approved funding for 27 new schools. **302EP** will further help achieve this policy target.

6. The North District, in which **302EP** is located, currently has 45 public sector primary schools providing 574 classrooms. SEM forecasts that 193 additional classrooms will be required for full implementation of whole-day primary schooling in the district by the 2007/08 school year. To meet this demand, two primary school projects providing 60 classrooms have already been completed for operation in the 2003/04 school year. **302EP**, which has yet to be allocated to a school sponsor, will help reduce the shortfall by 30 classrooms to 103 in the district and facilitate conversion of bi-sessional classes into whole-day operation. We plan to meet the rest of the projected shortfall in this district through further school construction projects.

**FINANCIAL IMPLICATIONS**

7. We estimate the capital cost of **245ES** and **302EP** to be \$119.2 million and \$98.4 million respectively in MOD prices (see paragraph 8 below), made up as follows –

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<sup>2</sup> Based on previous population distribution projection, 56 schools were planned for completion between 2003 to 2007 to achieve 100% whole-day primary schooling. We have updated the school building plan having regard to the latest population distribution projection and other considerations, such as parental choices and the popularity of schools. As a result, we have suspended two originally planned projects and added 11 new projects to the programme. This makes up our target of building a total of 65 schools between 2003 and 2007.

	\$ million		
	245ES	302EP	
(a) Demolition	0.3	0.1	
(b) Piling	19.7	15.5	
(c) Building	57.5	45.6	
(d) Building services	19.4	14.9	
(e) Drainage and external works	11.3	10.0	
(f) Furniture and equipment <sup>3</sup>	–	3.7	
(g) Consultants' fees for –	2.8	2.3	
(i) Contract administration	2.0	1.8	
(ii) Site supervision	0.8	0.5	
(h) Contingencies	11.1	8.8	
Sub-total	122.1	100.9	(in September 2003 prices)
(i) Provision for price adjustment	(2.9)	(2.5)	
Total	119.2	98.4	(in MOD prices)

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Based on the furniture and equipment reference list prepared by the Education and Manpower Bureau for new schools adopting the standard schedule of accommodation.

D Arch S proposes to engage consultants to undertake contract administration and site supervision of the projects. A detailed breakdown of the estimate for consultants' fees by man-months is at Enclosure 3. The construction floor areas (CFAs) of **245ES** and **302EP** are 13 197 square metres and 11 344 square metres respectively. The estimated construction unit costs of **245ES** and **302EP**, represented by the building and building services costs, are \$5,827 and \$5,333 respectively per square metre of CFA in September 2003 prices. D Arch S considers these unit costs comparable to those of 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 **245ES** is at Enclosure 4. A similar comparison between a 30-classroom primary school and **302EP** is at Enclosure 5.

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

Year	\$ million (Sept 2003)		Price adjustment factor	\$ million (MOD)	
	<b>245ES</b>	<b>302EP</b>		<b>245ES</b>	<b>302EP</b>
2004 – 05	25.0	20.0	0.98225	24.6	19.6
2005 – 06	48.0	40.0	0.97734	46.9	39.1
2006 – 07	34.0	28.1	0.97245	33.1	27.3
2007 – 08	12.0	10.0	0.96759	11.6	9.7
2008 – 09	3.1	2.8	0.96638	3.0	2.7
	<u>122.1</u>	<u>100.9</u>		<u>119.2</u>	<u>98.4</u>

9. We have derived the MOD estimates on the basis of the Government's latest forecast of trend labour and construction prices for the period 2004 to 2009. We will deliver the works through a lump-sum contract with provision for price adjustment because the contract period will be more than 21 months.

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10. The cost of furniture and equipment<sup>4</sup> for **245ES**, estimated to be \$7.8 million, will be borne by the school sponsor as the school premises will meet increase in demand for school places. For **302EP**, the cost of furniture and equipment, estimated to be \$3.7 million, will be borne by the Government as the school premises will enable an existing bi-sessional school to convert into whole-day operation. These are in line with existing policies.

11. We estimate the annual recurrent expenditure for **245ES** to be \$39.8 million and the additional annual recurrent expenditure for **302EP** to be \$2.4 million.

## **PUBLIC CONSULTATION**

12. We consulted the North District Council on 15 April 2003. Members of the Council supported both projects.

## **ENVIRONMENTAL IMPLICATIONS**

13. We engaged a consultant to conduct Preliminary Environmental Reviews (PERs) for **245ES** and **302EP** in June 2002. 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 –

<b>Project no.</b>	<b>Mitigation measures</b>	<b>Estimated cost \$ million (in Sept 2003 prices)</b>
<b>245ES</b>	(a) Classroom block	2.6
	Provision of insulated windows and air-conditioning to 25 classrooms from the 1/F to 3/F and the 5/F to 6/F; and two small group teaching rooms on the 4/F at the south-eastern façade	

/(b) .....

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<sup>4</sup> Based on the furniture and equipment reference list prepared by the Education and Manpower Bureau for new schools adopting the standard schedule of accommodation.

Project no.	Mitigation measures	Estimated cost \$ million (in Sept 2003 prices)
	(b) Special room block  Provision of insulated windows and air-conditioning to six special rooms on the G/F and from the 2/F to 6/F at the north-eastern façade; and six special rooms from the 2/F to 6/F and one small group teaching room on the 4/F at the south-western façade	2.5
	(c) Construction of a two-metre high boundary wall at the south-eastern side of the site	0.3
<b>302EP</b>	(d) Classroom block  Provision of insulated windows and air-conditioning to seven classrooms from the 3/F to 6/F and three small group teaching rooms from the 3/F to 5/F at the north-western façade; and eight classrooms from the 4/F to 6/F at the south-eastern façade	1.7
	(e) Special room block  Provision of insulated windows and air-conditioning to four special rooms on the 2/F, 3/F and 5/F at the north-western façade	0.8
	(f) Construction of a two-metre high boundary wall at the south-western side of the site	0.2

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

14. 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 sites, and the provision of wheel-washing facilities.



15. 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 sites 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.

16. 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. D Arch S will require the contractors 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 project 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>5</sup>		C&D materials to landfills	
		m <sup>3</sup>	%	m <sup>3</sup>	%	m <sup>3</sup>	%
<b>245ES</b>	3 560	2 290	64.3	710	20.0	560	15.7
<b>302EP</b>	2 870	1 850	64.4	570	19.9	450	15.7

The notional cost of accommodating C&D waste at landfill sites is estimated to be \$70,000 for **245ES** and \$56,250 for **302EP** (based on a notional unit cost<sup>6</sup> of \$125/m<sup>3</sup>).

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<sup>5</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>6</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.

## LAND ACQUISITION

17. To implement the projects, D Arch S has requested the resumption of all private land within the project site. This comprises 29 private agricultural lots with a total area of 10 130 square metres. We expect to complete the land resumption formalities for the site in June 2004. We will charge the land acquisition cost, estimated to be \$43 million, to **Head 701** "Land Acquisition".

18. As there are some village houses erected on the private lots to be resumed, we will make the necessary re-housing arrangements for the affected households. Demolition of these village houses will be carried out under the construction contract.

## BACKGROUND INFORMATION

19. We upgraded **245ES** and **302EP** to Category B in December 2001. We engaged an architectural consultant in June 2002 to undertake the detailed design, PERs and topographical survey, and a term contractor in October 2002 to carry out site investigation for both projects at a total cost of \$6.6 million. We engaged a quantity surveying consultant in August 2003 to prepare tender documents for both projects at a total cost of \$1 million. 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 contractor have completed the detailed design, PERs, topographical survey and site investigations. The quantity surveying consultant is finalising the tender documents.

20. The proposed construction of one secondary school and one primary school in Area 31, Sheung Shui, will involve removal of 39 trees, including 22 trees to be felled and 17 trees to be replanted within the project sites. All trees to be removed are not important trees<sup>7</sup>. We will incorporate planting proposals as part of the project, including estimated quantities of 178 trees, 3 730 shrubs, 1 400 annuals and 350 square metres of grassed area.

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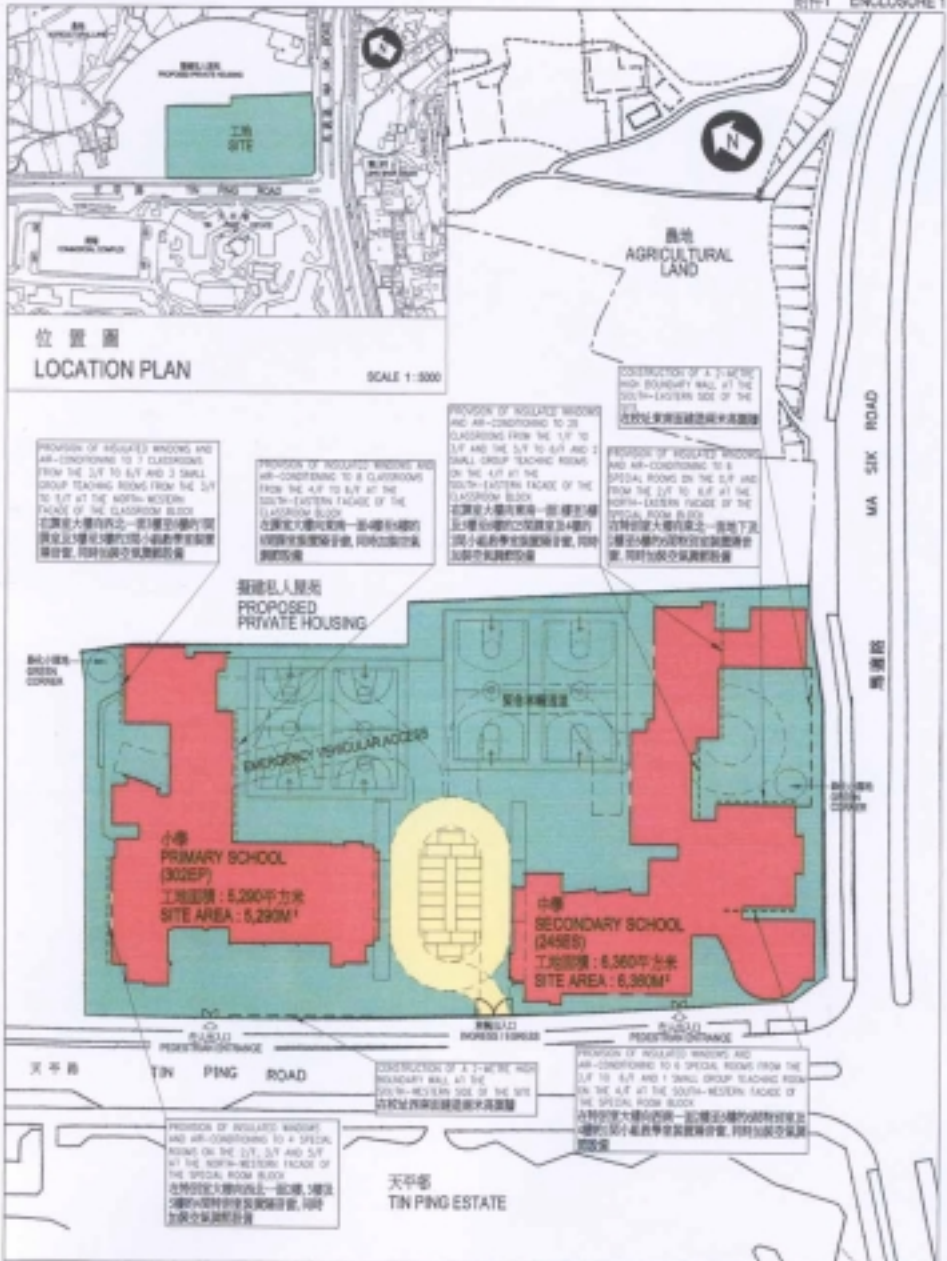
<sup>7</sup> Important trees include trees on Register of Old and Valuable Trees, and any other trees which meet one or more of the following criteria –


- (a) trees over 100 years old;
- (b) trees of cultural, historical or memorable significance;
- (c) trees of precious or rare species;
- (d) trees of outstanding form; or
- (e) trees with trunk diameter exceeding one metre (measured at one metre above ground level).

21. We estimate that the projects will create the following job opportunities –

<b>Project no.</b>	<b>Professional/ technical staff</b>	<b>Labourer</b>	<b>Total no. of staff</b>	<b>Total man-months</b>
<b>245ES</b>	20	100	120	2 500
<b>302EP</b>	15	80	95	2 000

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Education and Manpower Bureau  
October 2003



99# 24ES & 302EP 上水第31區的 1所中學和1所小學 A SECONDARY SCHOOL AND A PRIMARY SCHOOL IN AREA 31, SHEUNG SHUI	drawn by 方冠華 DAMA FONG	date 23.11.03	drawing no. AB/6453/NM-01	scale 1:1000
	approved 黎耀庭 REMBERT S.K. LAI	date 23.11.03	 ARCHITECTURAL SERVICES DEPARTMENT	
	office ARCHITECTURAL BRANCH			



電腦繪製的工地模擬圖(南面)

COMPUTER RENDERED DRAWING OF THE SITE (SOUTHERN VIEW)

Site 345ES &amp; 302EP

上水第31區的

1所中學和1所小學

A SECONDARY SCHOOL AND

A PRIMARY SCHOOL

IN AREA 31, SHEUNG SHUI

drawn by  
盧文偉 MICHAEL LOOdate  
23.01.03drawing no.  
AB/6453/NM-02scale  
N.T.S.approved  
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SERVICES  
DEPARTMENT

**245ES – Secondary school in Area 31, Sheung Shui**  
**302EP – Primary school in Area 31, Sheung Shui**

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

Consultants' staff costs		Estimated man-months		Average MPS* salary point	Multiplier (Note 1)	Estimated fee (\$ million)	
		245ES	302EP			245ES	302EP
(a) Contract administration (Note 2)	Professional	–	–	–	–	1.3	1.2
	Technical	–	–	–	–	0.7	0.6
(b) Site supervision (Note 3)	Professional	8.7	5.4	38	1.6	0.8	0.5
					Total	2.8	2.3

\* MPS = Master Pay Scale

**Notes**

1. A multiplier of 1.6 is applied to the average MPS point to estimate the cost of resident site staff supplied by the consultants. (As at 1 October 2002, MPS point 38 = \$57,730 per month.)
2. The consultants' staff cost for contract administration is calculated in accordance with the existing consultancy agreements for the design and construction of **245ES** and **302EP**. The assignment will only be executed subject to Finance Committee's approval to upgrade **245ES** and **302EP** to Category A.
3. The consultants' staff cost for site supervision is based on the estimate prepared by the Director of Architectural Services. We will only know the actual man-months and actual costs after completion of the construction works.

**A comparison of the reference cost of  
a secondary school project  
with the estimated cost of 245ES**

\$ million (in Sept 2003 prices)				
		Reference cost*	245ES	
(a)	Demolition	–	0.3	(See note A)
(b)	Piling	9.5	19.7	(See note B)
(c)	Building	52.5	57.5	(See note C)
(d)	Building services	13.9	19.4	(See note D)
(e)	Drainage and external works	11.3	11.3	
(f)	Consultants' fees	–	2.8	(See note E)
(g)	Contingencies	8.7	11.1	
	Total	95.9	122.1	
(h)	Construction floor area	12 238 m <sup>2</sup>	13 197 m <sup>2</sup>	
(i)	Construction unit cost {[(c) + (d)] ÷ (h)}	\$5,426/m <sup>2</sup>	\$5,827/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 steel H-piles at an average depth of 30 metres, assuming 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. Demolition is required for the clearance of existing village houses after resumption.
- B. The piling cost is much higher because of the ground conditions, the larger construction floor area and the requirement to use 210 non-percussive “Jacked” steel H-piles at an average depth of 50 metres in order to avoid causing any damage to the neighbouring village houses.
- C. The building cost is higher because of the larger construction floor area.
- D. The building services cost is higher because of the larger construction floor area and the provision of air-conditioning as a noise mitigation measure.
- E. Consultants’ fees are required for contract administration and site supervision.



**A comparison of the reference cost of  
a 30-classroom primary school project  
with the estimated cost of 302EP**

**\$ million (in Sept 2003 prices)**

		<b>Reference cost*</b>	<b>302EP</b>	
(a)	Demolition	–	0.1	(See note A)
(b)	Piling	8.0	15.5	(See note B)
(c)	Building	43.3	45.6	(See note C)
(d)	Building services	11.5	14.9	(See note D)
(e)	Drainage and external works	10.0	10.0	
(f)	Furniture and equipment	–	3.7	(See note E)
(g)	Consultants' fees	–	2.3	(See note F)
(h)	Contingencies	7.2	8.8	
	<b>Total</b>	<u>80.0</u>	<u>100.9</u>	
(i)	Construction floor area	10 727 m <sup>2</sup>	11 344 m <sup>2</sup>	
(j)	Construction unit cost {[(c) + (d)] ÷ (i)}	\$5,109/m <sup>2</sup>	\$5,333/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 steel H-piles at an average depth of 30 metres, assuming 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. Demolition is required for the clearance of existing village houses after resumption.
- B. The piling cost is much higher because of the ground conditions, the larger construction floor area and the requirement to use 165 non-percussive “Jacked” steel H-piles at an average depth of 50 metres in order to avoid causing any damage to the neighbouring village houses.
- C. The building cost is higher because of the larger construction floor area.
- D. The building services cost is higher because of the larger construction floor area and the provision of air-conditioning as a noise mitigation measure.
- E. The cost of furniture and equipment, estimated to be \$3.7 million, will be borne by the Government as the school premises will be allocated to an existing bi-sessional school for conversion into whole-day operation.
- F. Consultants’ fees are required for contract administration and site supervision.