For discussion **PWSC(2001-02)58**
on 17 October 2001

ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

HEAD 703 - BUILDINGS
Education - Secondary
232ES - Secondary school in Area 20, Tung Chung
233ES - Secondary school in Area 40, Tung Chung
240ES - Second secondary school in Area 40, Tung Chung

Education - Primary
279EP - Primary school in Area 20, Tung Chung

Members are invited to recommend to Finance Committee the upgrading of **232ES**, **233ES**, **240ES** and **279EP** to Category A at an estimated cost of $113.0 million, $101.0 million, $101.0 million and $95.6 million respectively in money-of-the-day prices for the construction of three secondary schools and one 30-classroom primary school in Tung Chung.

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 $410.6 million in money-of- the-day (MOD) prices -

	Project estimate $ million (MOD)
(a) **232ES** - Secondary school in Area 20, Tung Chung	113.0
(b) **233ES** - Secondary school in Area 40, Tung Chung	101.0
(c) **240ES** - Second secondary school in Area 40, Tung Chung	101.0
(d) **279EP** - Primary school in Area 20, Tung Chung	95.6
Total	410.6

PROJECT SCOPE AND NATURE

3. The four proposed schools, which will all adopt standard designs, are located in Tung Chung. The facilities for the four schools will include -

		(Secondary schools)			**(Primary school)**
		232ES	**233ES**	**240ES**	**279EP**
(a)	classrooms;	30	30	30	30
(b)	special rooms, including a computer-assisted learning room and a language room;	16	16	16	6
(c)	small group teaching rooms;	3	3	3	4

/(d) …..

		(Secondary schools)			(Primary school)
		232ES	**233ES**	**240ES**	**279EP**
(d)	guidance activity room;	1	1	1	1
(e)	interview rooms;	2	2	2	2
(f)	staff room;	1	1	1	1
(g)	staff common room;	1	1	1	1
(h)	student activity centre;	1	1	1	1
(i)	conference room;	1	1	1	1
(j)	library;	1	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	1
(l)	multi-purpose area;	1	1	1	1
(m)	basketball courts (including one on ground level and one at the rooftop of the assembly block);	2	2	2	2
(n)	green corner[1];	1	1	1	1
(o)	ancillary accommodation including a lift and relevant facilities for the handicapped;	Available	Available	Available	Available

/**Shared** …..

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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.

Shared facilities

(p) running track and sandpit;

(q) a mini-soccer pitch cum sports field and a spectator stand;

(r) carparking facilities; and

(s) volley ball court.

Items (p) to (r) above will be shared between **232ES** and **279EP**, and between **233ES** and **240ES**. Item (s) above will be shared between **233ES** and **240ES**. The common facilities provided for **233ES** and **240ES** will also be shared by the adjacent primary school which is still under planning. These schools will all meet the planning target of providing two square metres of open space per student.

4. A site plan for **232ES** and **279EP** is at Enclosure 1 and that for **233ES** and **240ES** at Enclosure 2. D Arch S plans to start construction works for the four projects in December 2001 for completion in July 2003.

JUSTIFICATION

232ES - Secondary school in Area 20, Tung Chung
233ES - Secondary school in Area 40, Tung Chung
240ES - Second secondary school in Area 40, Tung Chung

5. 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. **232ES**, **233ES** and **240ES**, together with **239ES**, **241ES** and **242ES**, to be considered by Members at this meeting (see papers referenced PWSC(2001-02)59 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.

279EP - Primary school in Area 20, Tung Chung

6. 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.

7. 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. **279EP** will help achieve this policy target. Another three schools, covered in **284EP**, **292EP** and **293EP**, will also be considered by Members at this meeting (see papers referenced PWSC(2001-02)59 and PWSC(2001-02)60).

8. The Islands District, in which **279EP** is located, currently has 24 public sector primary schools providing 246 classrooms. D of E forecasts that an additional 50 classrooms will be required for full implementation of whole-day primary schooling by the school year 2007/08. **279EP** will help reduce the shortfall by 30 classrooms to 20 classrooms in this district. We plan to meet the projected shortfall in this district through another school construction project.

FINANCIAL IMPLICATIONS

9. We estimate the capital cost of **232ES**, **233ES**, **240ES** and **279EP** to be $113.0 million, $101.0 million, $101.0 million and $95.6 million respectively in MOD prices (see paragraph 11 below), made up as follows -

		$ million				
		232ES	**233ES**	**240ES**	**279EP**	
(a)	Piling	18.8	11.8	11.8	16.5	
(b)	Building	54.9	54.9	54.9	45.3	
(c)	Building services	18.3	14.3	14.3	15.3	
(d)	Drainage and external works	10.5	10.5	10.5	9.5	
(e)	Contingencies	10.3	9.2	9.2	8.7	
	Sub-total	112.8	100.7	100.7	95.3	(in September 2001 prices)
(f)	Provision for price adjustment	0.2	0.3	0.3	0.3	
	Total	113.0	101.0	101.0	95.6	(in MOD prices)

/10. …..

10. The respective estimated construction unit costs for **232ES**, **233ES**, **240ES** and **279EP** in September 2001 prices, represented by building and building services costs, are as follows -

Project no.	Construction floor area (CFA) m^2	Estimated construction unit cost per m^2 of CFA $
232ES	12 238	5,981
233ES	12 238	5,655
240ES	12 238	5,655
279EP	10 727	5,649

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 **232ES**, **233ES** and **240ES** is at Enclosure 3. A similar comparison between a 30-classroom primary school and **279EP** is at Enclosure 4.

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

Year	$ million (September 2001)				Price adjustment factor	$ million (MOD)			
	232ES	**233ES**	**240ES**	**279EP**		**232ES**	**233ES**	**240ES**	**279EP**
2001 - 02	3.0	3.0	3.0	2.0	1.00000	3.0	3.0	3.0	2.0
2002 - 03	51.5	45.4	45.4	42.5	0.99700	51.3	45.3	45.3	42.4
2003 - 04	47.3	41.7	41.7	40.4	1.00398	47.5	41.9	41.9	40.6
2004 - 05	8.0	7.6	7.6	7.4	1.01101	8.1	7.7	7.7	7.5
2005 - 06	3.0	3.0	3.0	3.0	1.01808	3.1	3.1	3.1	3.1
	112.8	100.7	100.7	95.3		113.0	101.0	101.0	95.6

/12. …..

12. 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 will be less than 21 months and we can clearly define the scope of works in advance, leaving little room for uncertainty.

13. The cost of furniture and equipment[2], estimated to be $9.4 million each for **232ES**, **233ES** and **240ES** and $4.5 million for **279EP**, will be borne by the school sponsors as the schools will be allocated to meet increase in demand for school places. This is in line with existing policy.

14. We estimate the annual recurrent expenditure for **232ES**, **233ES** and **240ES** to be $40.9 million each and that for **279EP** to be $22.2 million.

PUBLIC CONSULTATION

15. We consulted the Islands Provisional District Board on **232ES**, **233ES** and **279EP** in August 1999. Members raised no objection to the projects. We consulted the Islands District Council on **240ES** in April 2001. Members also supported the project.

ENVIRONMENTAL IMPLICATIONS

16. We engaged consultants to conduct Preliminary Environment Reviews (PERs) for **232ES** and **279EP** in November 1998, **233ES** in June 1999 and **240ES** in January 2001. The PERs concluded that **233ES** and **240ES** would not be subject to adverse environmental impacts. For **232ES** and **279EP**, it was 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 -

/**232ES** …..

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[2] Based on the standard furniture and equipment lists prepared by Education Department for "Year 2000 design" schools.

Project no.	Mitigation measures	Estimated cost $ million (in Sept 2001 prices)
232ES	(a) Provision of insulated windows and air-conditioning to 30 classrooms and one small group teaching room from 1/F to 6/F at the northern façade of the classroom block; ten special rooms from 1/F to 6/F at the eastern, southern and western façades of the special room block; as well as one special room and one small group teaching room on 1/F at the southern and western façades of the assembly hall block	4.0
279EP	(b) Provision of insulated windows and air-conditioning to 30 classrooms and four small group teaching rooms from 1/F to 6/F at the southern and northern façades of the classroom block; as well as four special rooms on 2/F and 3/F at the eastern façade of the special room block	3.4

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

17. 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.

18. 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.

/19. …..

19. 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[3]		Organic materials to landfills	
	m^3	m^3	%	m^3	%	m^3	%
232ES	3 250	2 100	64.6	650	20.0	500	15.4
233ES	3 250	2 100	64.6	650	20.0	500	15.4
240ES	3 250	2 100	64.6	650	20.0	500	15.4
279EP	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 **232ES**, **233ES** and **240ES** and $56,250 for **279EP** (based on a notional unit cost[4] of $125/$m^3$).

LAND ACQUISITION

20. All the four projects do not require land acquisition.

/BACKGROUND …..

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[3] 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.

[4] 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

21. We upgraded **232ES**, **233ES** and **279EP** to Category B in September 2000 and **240ES** in May 2001. We engaged consultants to carry out PERs and topographical surveys and employed term contractors to carry out site investigations for the four projects at the following dates and costs -

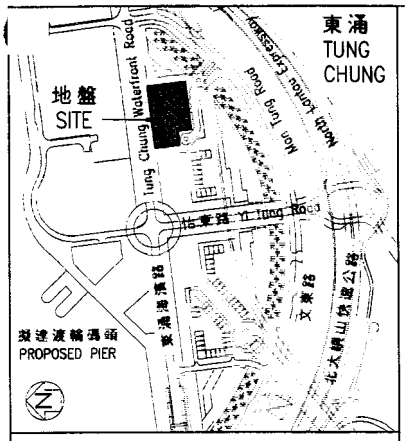
Project no.	PER	Topographical survey	Site investigation	Total cost
232ES	November 1998	April 2001	April 2001	$973,000
233ES	June 1999	March 2001	August 1999	$878,000
240ES	January 2001	March 2001	March 2001	$940,000
279EP	November 1998	April 2001	April 2001	$873,000

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. D Arch S has completed detailed design and tender documents of the projects using in-house staff resources.

22. 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
232ES	3	7	165	175	2 940
233ES	3	7	145	155	2 620
240ES	3	7	145	155	2 620
279EP	3	7	135	145	2 500

Education and Manpower Bureau
October 2001



位置圖 LOCATION PLAN
SCALE 1:20000

PROVISION OF INSULATED WINDOWS AND AIR-CONDITIONING TO 4 SPECIAL ROOMS ON 2/F AND 3/F AT THE EASTERN FACADE OF THE SPECIAL ROOM BLOCK
在特別室大樓向東面二樓及三樓之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 30 CLASSROOMS AND 4 SMALL GROUP TEACHING ROOMS FROM 1/F TO 6/F AT THE SOUTHERN AND NORTHERN FACADES OF THE CLASSROOM BLOCK
在課室大樓向南面及北面由一樓至六樓之三十間課室與四間小組教學室安裝隔音玻璃窗和空氣調節

住宅用地
RESIDENTIAL LAND

七米闊
渠務專用範圍
7m WIDE
DRAINAGE RESERVE

綠化小園地

行人出入口
PEDESTRIAN ENTRANCE

沙池
SAND PIT

六十米跑步徑
60m RUNNING TRACK

TUNG CHUNG WATERFRONT ROAD 東涌海濱路

AMENITY 美化市容地帶
CYCLE TRACK 單車徑
FOOTPATH 行人路

小型足球場
兼運動場
MINI-SOCCER PITCH-CUM-SPORTS FIELD

共用設施
SHARED FACILITIES

KIN TUNG ROAD 健東路

車輛出口
EGRESS POINT

車輛通道 EVA

停車場
CARPARK

共用設施
SHARED FACILITIES

車輛入口
INGRESS POINT

行人出入口
PEDESTRIAN ENTRANCE

6.40

6.20

住宅用地
RESIDENTIAL LAND

PROVISION OF INSULATED WINDOWS AND AIR-CONDITIONING TO 10 SPECIAL ROOMS FROM 1/F TO 6/F AT THE EASTERN, SOUTHERN AND WESTERN FACADES OF THE SPECIAL ROOM BLOCK
在特別室大樓向東面、南面及西面一樓至六樓之十間特別室安裝隔音玻璃窗和空氣調節

PROVISION OF INSULATED WINDOWS AND AIR-CONDITIONING TO 30 CLASSROOMS AND 1 SMALL GROUP TEACHING ROOM FROM 1/F TO 6/F AT THE NORTHERN FACADE OF THE CLASSROOM BLOCK
在課室大樓向北面由一樓至六樓之三十間課室與一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 1 SPECIAL ROOM AND 1 SMALL GROUP TEACHING ROOM ON 1/F AT THE SOUTHERN AND WESTERN FACADES OF THE ASSEMBLY HALL BLOCK
在禮堂大樓向南面及西面一樓之一間課室與一間小組教學室安裝隔音玻璃窗和空氣調節

休憩用地
PUBLIC OPEN SPACE

title 232ES & 279EP
東涌第20區
1所中學和1所小學
SECONDARY SCHOOL & PRIMARY SCHOOL IN AREA 20, TUNG CHUNG

drawn by	date
Y.L. LAM	14/6/01
approved	date
SIMON CHAN	14/6/01
office ARCHITECTURAL BRANCH	

drawing no.	scale
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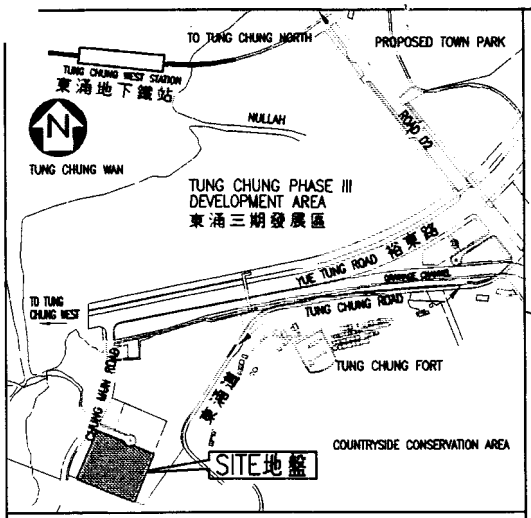
建築署
ARCHITECTURAL SERVICES DEPARTMENT

GRP. DIV.

A4 210 x 297



LOCATION PLAN 位置圖 Scale: N.T.S.

DISTRICT OPEN SPACE
休憩用地

PROPOSED PRIMARY SCHOOL SITE
擬建小學地盤

815 300 N

CHUNG MUN ROAD 松滿路

PEDESTRIAN ENTRANCE 行人出入口

EGRESS 車輛出口

CHUNG YAT STREET 松逸街

INGRESS 車輛入口

PEDESTRIAN ENTRANCE 行人出入口

CARPARK 停車場-
SHARED FACILITIES 共用設施

EVA 緊急車輛通道

AMENITY AREA
休憩區

VOLLEYBALL COURT 排球場

SPECTATOR STAND 觀眾席

MINI-SOCCER PITCH-CUM-SPORTS FIELD 迷你足球場兼運動場

SHARED FACILITIES

60m RUNNING TRACK
六十米跑步徑

SAND PIT 沙池

DISTRICT OPEN SPACE
休憩用地

815 200 N

TOTAL AREA 地盤面積 13 600 SQ.M. 平方米

DISTRICT OPEN SPACE
休憩用地

811 000 E

811 100 E

title 233ES & 240ES SECONDARY SCHOOL IN AREA 40, TUNG CHUNG AND SECOND SECONDARY SCHOOL IN AREA 40, TUNG CHUNG 東涌40區第1所中學及 東涌40區第2所中學	drawn by W.M. YIU	date 14.06.01	drawing no. AB/5808&6431/XB201	scale 1:1000
	approved SIMON CHAN	date 14.06.01		
	office ARCHITECTURAL BRANCH		ARCHITECTURAL SERVICES DEPARTMENT	

Enclosure 3 to PWSC(2001-02)58

A comparison of the reference cost for a secondary school project with the estimated costs of 232ES, 233ES and 240ES

$ million (in Sept 2001 prices)

		Reference cost*	232ES	233ES	240ES	
(a)	Piling	11.0	18.8	11.8	11.8	(See note A)
(b)	Building	54.9	54.9	54.9	54.9	
(c)	Building services	14.3	18.3	14.3	14.3	(See note B)
(d)	Drainage and external works	10.5	10.5	10.5	10.5	
(e)	Contingencies	9.0	10.3	9.2	9.2	
	Total	99.7	112.8	100.7	100.7	
(f)	Construction floor area	12 238m^2	12 238m^2	12 238m^2	12 238m^2	
(g)	Construction unit cost {[(b)+(c)]÷(f)}	\$5,655/m^2	\$5,981/m^2	\$5,655/m^2	\$5,655/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. **For 232ES**
The piling cost is higher because it is based on the use of 25 numbers of large diameter bored piles at an average depth of 42 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 layers of extensive large boulders.

For 233ES and 240ES
The piling cost is higher because it is based on the use of 128 numbers of steel H-piles at an average depth of 34 metres instead of 138 numbers of steel H-piles at an average depth of 30 metres assumed for the reference cost. Longer piles are required to suit the bedrock level.

B. The building services cost for **232ES** is higher because of the provision of air-conditioning as a noise mitigation measure.

Enclosure 4 to PWSC(2001-02)58

A comparison of the reference cost of a 30-classroom primary school project with the estimated cost of 279EP

$ million (in Sept 2001 prices)

		Reference cost*	**279EP**	
(a)	Piling	9.0	16.5	(See note A)
(b)	Building	45.3	45.3	
(c)	Building services	11.9	15.3	(See note B)
(d)	Drainage and external works	9.5	9.5	
(e)	Contingencies	7.5	8.7	
	Total	83.2	95.3	
(f)	Construction floor area	10 727m^2	10 727m^2	
(g)	Construction unit cost {[(b) + (c)] ÷ (f)}	$5,332/$m^2$	$5,649/$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. The piling cost is higher because it is based on the use of 22 numbers of large diameter bored piles at an average depth of 42 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 layers of extensive large boulders.

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