For discussion **PWSC(2003-04)18**
on 21 May 2003

ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

HEAD 703 – BUILDINGS
Education – Secondary
251ES – Secondary school at Nam Fung Road, Aberdeen

Members are invited to recommend to Finance Committee the upgrading of **251ES** to Category A at an estimated cost of $124.9 million in money-of-the-day prices for the construction of a secondary school at Nam Fung Road, Aberdeen.

PROBLEM

We do not have enough secondary schools to meet the increase in demand for new school places by the school year 2007/08.

PROPOSAL

2. The Director of Architectural Services (D Arch S), with the support of the Secretary for Education and Manpower (SEM), proposes to upgrade **251ES** to Category A at an estimated cost of $124.9 million in money-of-the-day (MOD) prices for the construction of a 30-classroom secondary school at Nam Fung Road, Aberdeen.

PROJECT SCOPE AND NATURE

3. The proposed secondary school will have the following facilities –

(a) …..

(a) 30 classrooms;

(b) 16 special rooms, including a computer-assisted learning room and a language room;

(c) three small group teaching rooms;

(d) a guidance activity room;

(e) two interview rooms;

(f) a staff room;

(g) a staff common room;

(h) a student activity centre;

(i) a conference room;

(j) a library;

(k) an assembly hall (which, together with the roof of the assembly hall block, can be used for a wide range of physical activities such as badminton, gymnastics and table-tennis);

(l) a multi-purpose area;

(m) two basketball courts (one on an elevated deck and one at the rooftop of the assembly hall block);

(n) a green corner[1]; and

(o) ancillary accommodation including two lifts and relevant facilities for the handicapped.

The proposed school will meet the planning target of providing two square metres of open space per student. A site plan is at Enclosure 1 and computer rendering drawings of the school premises are at Enclosure 2. D Arch S plans to start construction works in November 2003 for completion in July 2005.

/**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

4. SEM forecasts that 930 additional secondary school classes will be required in the territory between the 2003/04 and 2007/08 school years to meet the increase in demand for new places. To date, Finance Committee has approved funding for 20 new schools providing 588 classrooms. The proposed school will provide 30 classrooms. The shortfall of secondary school classes will therefore be reduced to 312 classrooms. Another 30-classroom secondary school, covered in **254ES**, will also be considered by Members at this meeting (see paper referenced PWSC(2003-04)19). We plan to meet the rest of the projected shortfall through further school construction projects.

FINANCIAL IMPLICATIONS

5. We estimate the capital cost of the project to be $124.9 million in MOD prices (see paragraph 6 below), made up as follows –

			$ million	
(a)	Site formation		8.0	
(b)	Piling		20.9	
(c)	Building		61.9	
(d)	Building services		15.7	
(e)	Drainage and external works		12.1	
(f)	Consultants' fees for –		3.3	
	(i) Contract administration	2.4		
	(ii) Site supervision	0.9		
(g)	Contingencies		12.2	
	Sub-total		134.1	(in September 2002 prices)
(h)	Provision for price adjustment		(9.2)	
	Total		124.9	(in MOD prices)

/D Arch S …..

D Arch S proposes to engage consultants to undertake contract administration and site supervision of the project. A detailed breakdown of the estimate for consultants' fees by man-months is at Enclosure 3. The construction floor area (CFA) of **251ES** is 14 600 square metres. The estimated construction unit cost, represented by the building and the building services costs, is $5,315 per square metre of CFA in September 2002 prices. D Arch S considers this 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 **251ES** is at Enclosure 4.

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

Year	$ million (Sept 2002)	Price adjustment factor	$ million (MOD)
2003 – 04	10.0	0.94300	9.4
2004 – 05	55.0	0.93003	51.2
2005 – 06	53.1	0.93003	49.4
2006 – 07	14.0	0.93003	13.0
2007 – 08	2.0	0.93003	1.9
	134.1		124.9

7. We have derived the MOD estimates on the basis of the Government's latest forecast of trend labour and construction prices for the period 2003 to 2008. 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.

8. The cost of furniture and equipment[2], estimated to be $8.6 million, will be borne by the school sponsor as the school will meet increase in demand for school places. This is in line with the existing policy.

/9. …..

[2] Based on a standard furniture and equipment list prepared by the Education and Manpower Bureau for "Year 2000 design" schools.

9. We estimate the annual recurrent expenditure of the project to be $42.6 million.

PUBLIC CONSULTATION

10. We consulted the Southern District Council on 9 September 2002. Members of the Council supported the project.

ENVIRONMENTAL IMPLICATIONS

11. We engaged a consultant to conduct a Preliminary Environmental Review (PER) for the project in August 2002. The PER concluded that the school would not be subject to adverse environmental impacts provided that we install insulated windows and air-conditioning to 11 special rooms and two small group teaching rooms from the 1/F to 3/F at the eastern façade of the special room block in order to keep the road traffic noise impact within the limits recommended in the Hong Kong Planning Standards and Guidelines. We have included $2.3 million as part of the building services works in the project estimate to implement the above mitigation measures.

12. 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.

13. 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 design 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.

/14. …..

14. 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. D Arch S will require the contractor 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 project will generate about 5 150 cubic metres (m^3) of C&D materials. Of these, we will reuse about 2 500 m^3 (48.6%) on site, 2 000 m^3 (38.8%) as fill in public filling areas[3], and dispose of 650 m^3 (12.6%) at landfills. The notional cost of accommodating C&D waste at landfill sites is estimated to be $81,250 for this project (based on a notional unit cost[4] of $125/$m^3$).

LAND ACQUISITION

15. The project does not require land acquisition.

BACKGROUND INFORMATION

16. We consulted the Legislative Council Panel on Education on 20 January 2003 on our latest plan for building secondary and primary schools. This project is one of the planned projects. The Panel had no objection to our proposed plan.

17. …..

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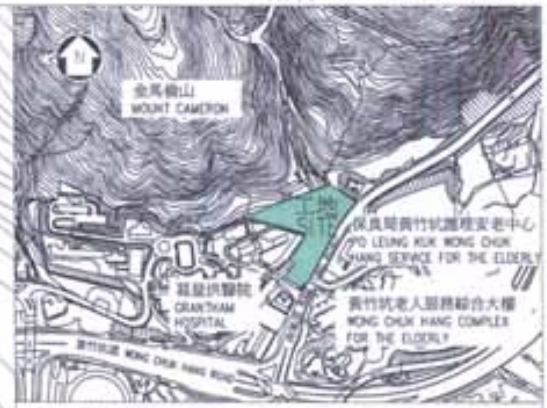
[3] A public filling area is a designated part of a development project that accepts public fill for reclamation purposes. Disposal of public fill in a public filling area requires a licence issued by the Director of Civil Engineering.

[4] This estimate has taken into account the cost for developing, operating and restoring the 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^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.

17. We upgraded **251ES** to Category B in February 2002. We engaged a term contractor to carry out site investigation in November 2002; and also consultants to undertake the detailed design in June 2002, topographical survey in July 2002, PER in August 2002, and tender documentation in March 2003 at a total cost of $3.8 million. We charged this to block allocation **Subhead 3100GX** "Project feasibility studies, minor investigations and consultants' fees for items in Category D of the Public Works Programme". The term contractor and the consultants have completed the site investigation, detailed design, topographical survey and PER of the project. The consultants are finalising the tender documentation.

18. We estimate that the project will create some 170 jobs comprising 15 professional/technical staff and 155 labourers, totalling 3 250 man-months.

Education and Manpower Bureau
May 2003



位置圖
LOCATION PLAN SCALE: 1:10000

title 251ES 香港仔南風道的1所中學 SECONDARY SCHOOL AT NAM FUNG ROAD, ABERDEEN	drawn by KY	date 04.02.03	drawing no. AB/6417/XA101	scale 1:1500
	approved A. CHEUNG	date 04.02.03		
	office ARCHITECTURAL BRANCH		ARCHITECTURAL SERVICES DEPARTMENT	

電腦繪製的校舍模擬圖（東南面）
COMPUTER RENDERING DRAWING OF THE SCHOOL PREMISES (SOUTH-EASTERN VIEW)

電腦繪製的校舍模擬圖（西南面）
COMPUTER RENDERING DRAWING OF THE SCHOOL PREMISES (SOUTH-WESTERN VIEW)

title 251ES 香港仔南風道的1所中學 SECONDARY SCHOOL AT NAM FUNG ROAD, ABERDEEN	drawn by KY	date 04.02.03	drawing no. AB/6417/XA102	scale N.T.S.
	approved A. CHEUNG	date 04.02.03		
	office ARCHITECTURAL BRANCH		ARCHITECTURAL SERVICES DEPARTMENT	

251ES – Secondary school at Nam Fung Road, Aberdeen

Breakdown of the estimate for consultants' fees

Consultants' staff costs		Estimated man-months	Average MPS* salary point	Multiplier (Note 1)	Estimated fee ($ million)
(a) Contract administration (Note 2)	Professional	–	–	–	1.8
	Technical	–	–	–	0.6
(b) Site supervision (Note 3)	Professional	9.7	38	1.6	0.9
				Total	3.3

* 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 is $57,730 per month.)

2. The consultants' staff cost for contract administration is calculated in accordance with the existing consultancy agreement for the design and construction of **251ES**. The assignment will only be executed subject to Finance Committee's approval to upgrade **251ES** 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 251ES

$ million (in Sept 2002 prices)

		Reference cost*	**251ES**	
(a)	Site formation	–	8.0	(See note A)
(b)	Piling	9.0	20.9	(See note B)
(c)	Building	50.2	61.9	(See note C)
(d)	Building services	12.8	15.7	(See note D)
(e)	Drainage and external works	10.5	12.1	(See note E)
(f)	Consultants' fees	–	3.3	(See note F)
(g)	Contingencies	8.3	12.2	
	Total	90.8	134.1	
(h)	Construction floor area	12 238 m^2	14 600 m^2	
(i)	Construction unit cost {[(c) + (d)] ÷ (h)}	$5,148/$m^2$	$5,315/$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 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. Site formation is required as the majority of the site is on sloping ground which necessitates retaining structures and slope improvement works.

B. The piling cost is higher because it is based on the use of 296 pre-bored steel piles at an average depth of 35 metres instead of 138 steel H-piles at an average depth of 30 metres in order to minimise the disturbance caused to the nearby Grantham Hospital, Po Leung Kuk Wong Chuk Hang Service for the Elderly and Wong Chuk Hang Complex for the Elderly.

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, the requirement for two lifts and the provision of air-conditioning as a noise mitigation measure.

E. The drainage and external works costs are higher because of the need to provide protection measures at the base of adjacent slopes.

F. Consultants' fees are required for contract administration and site supervision.