

ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

HEAD 703 – BUILDINGS

Education – Secondary

258ES – Secondary school in Area 104, Tin Shui Wai

Education – Primary

321EP – Primary school in Area 104, Tin Shui Wai

Members are invited to recommend to Finance Committee the upgrading of **258ES** and **321EP** to Category A at an estimated cost of \$105.3 million and \$93.1 million respectively in money-of-the-day prices for the construction of one secondary school and one primary school in Area 104, Tin Shui Wai.

PROBLEM

We do not have enough secondary schools to meet the increase in demand for new school places by the school year 2007/08. 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 \$198.4 million in money-of-the-day (MOD) prices –

	Project estimate \$ million (MOD)
(a) 258ES – Secondary school in Area 104, Tin Shui Wai	105.3
(b) 321EP – Primary school in Area 104, Tin Shui Wai	93.1
Total	<hr/> 198.4 <hr/>

PROJECT SCOPE AND NATURE

3. The two proposed schools are located in Area 104, Tin Shui Wai. The facilities for the two schools will include –

	258ES (Secondary school)	321EP (Primary school)
(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

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	258ES (Secondary school)	321EP (Primary school)
(k) 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)	1	1
(l) multi-purpose area	1	1
(m) basketball courts (one at ground level of each school and for the secondary school, another one at the rooftop of the assembly hall block)	2	1
(n) green corner ¹	1	1
(o) ancillary accommodation, including a lift and relevant facilities for the handicapped	Available	Available

Shared facilities

- (p) a mini-football pitch-cum-two basketball courts
- (q) bus and car parking facilities

Both projects will meet the planning target of providing two square metres of open space per student. A site plan for **258ES** and **321EP** is at Enclosure 1 and computer rendering drawings of the school premises are at Enclosure 2. D Arch S plans to start the construction works for both projects in November 2003 for completion in July 2005.

JUSTIFICATION

258ES – Secondary school in Area 104, Tin Shui Wai

4. SEM forecasts that 930 additional secondary school classes will be
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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.

required in the territory between the 2003/04 and 2007/08 school years to meet the increase in demand for new school places. To date, Finance Committee has approved funding for 20 projects providing 588 classrooms, and two more secondary school projects involving 60 classrooms are pending approval². **258ES** will provide 30 classrooms. The shortfall of secondary school classes will therefore be reduced to 252 classrooms. Another 30-classroom secondary school project, covered in **244ES**, will also be considered by Members at this meeting (see paper referenced PWSC(2003-04)31). We plan to meet the rest of the projected shortfall through further school construction projects.

321EP – Primary school in Area 104, Tin Shui Wai

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 56³ new schools between the 2003/04 and 2007/08 school years. To date, Finance Committee has approved funding for 21 new schools, and two more are pending approval⁴. **321EP** will further help achieve this policy target. Another school project, covered in **306EP**, will also be considered by Members at this meeting (see paper referenced PWSC(2003-04)30).

6. The Yuen Long District, in which **321EP** is located, currently has 77 public sector primary schools providing 914 classrooms. SEM forecasts that

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² At the Public Works Subcommittee meeting on 21 May 2003, Members agreed to recommend to Finance Committee the upgrading of **251ES** and **254ES** for the construction of two 30-classroom secondary schools. The Finance Committee will consider the recommendation on 13 June 2003.

³ Based on previous population projection, 48 schools were originally planned to be completed between 2003 to 2007 to achieve 100% whole-day primary schooling. We have revised the plan having regard to the latest population demand and other factors, such as parental choice, project cost and popularity of schools, and have suspended seven originally planned projects. Of these seven projects, **289EP** “A 36-classroom primary school at Pokfield Road, Kennedy Town”, has been upgraded to Category A on 15 July 2002. The project is suspended because the tender outturn is \$32 million above the Approved Project Estimate and exceeds the reference cost for a 36-classroom primary school by about 120%. We consider it not cost-effective to proceed with this project at this level of cost. On the other hand, due to upsurge of population in five districts as revealed in the latest population projection, we plan to build 15 additional new primary schools in these districts by 2007. This makes up our target of building a total of 56 schools between 2003 and 2007.

⁴ At the Public Works Subcommittee meeting on 21 May 2003, Members agreed to recommend to Finance Committee the upgrading of **310EP** and **315EP** for the construction of a 36-classroom primary school in the Sham Shui Po District and a 30-classroom primary school in the Yuen Long District respectively. The Finance Committee will consider the recommendation on 13 June 2003.

406 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 requirement, two primary school projects providing 60 classrooms have already been upgraded to Category A and are planned for completion in the 2003/04 school year. Another 30-classroom primary school project, covered in **315EP**, is pending Finance Committee’s approval. **321EP** will help reduce the shortfall further by 30 classrooms to 286 in this 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 **258ES** and **321EP** to be \$105.3 million and \$93.1 million respectively in MOD prices (see paragraph 8 below), made up as follows –

	\$ million		
	258ES	321EP	
(a) Site formation	1.5	1.1	
(b) Piling	19.7	18.3	
(c) Building	50.2	41.3	
(d) Building services	17.8	14.2	
(e) Drainage and external works	13.5	12.5	
(f) Furniture and equipment ⁵	–	3.9	
(g) Contingencies	10.3	8.7	
Sub-total	113.0	100.0	(in September 2002 prices)
(h) Provision for price adjustment	(7.7)	(6.9)	
Total	105.3	93.1	(in MOD prices)

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⁵ Based on a standard furniture and equipment list prepared by the Education and Manpower Bureau for “Year 2000 design” schools.

The construction floor areas (CFAs) of **258ES** and **321EP** are 12 238 square metres and 10 727 square metres respectively. The estimated construction unit costs of **258ES** and **321EP**, represented by the building and building services costs, are \$5,556 and \$5,174 respectively per square metre of CFA in September 2002 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 cost for **258ES** is at Enclosure 3. A similar comparison between a 30-classroom primary school and **321EP** is at Enclosure 4.

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

Year	\$ million (Sept 2002)		Price adjustment factor	\$ million (MOD)	
	258ES	321EP		258ES	321EP
2003 – 04	10.0	8.0	0.94300	9.4	7.5
2004 – 05	42.0	38.0	0.93003	39.1	35.3
2005 – 06	46.0	40.4	0.93003	42.8	37.6
2006 – 07	13.0	11.6	0.93003	12.1	10.8
2007 – 08	2.0	2.0	0.93003	1.9	1.9
	<u>113.0</u>	<u>100.0</u>		<u>105.3</u>	<u>93.1</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 2003 to 2008. We will deliver the works through a fixed-price lump-sum contract because the contract period of both projects will be less than 21 months and we can clearly define the scope of works in advance, leaving little room for uncertainty.

10. The cost of furniture and equipment⁶, estimated to be \$8.6 million for **258ES**, will be borne by the school sponsor as the school will meet increase in demand for school places. For **321EP**, the cost of furniture and equipment, estimated to be \$3.9 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.

11. We estimate the annual recurrent expenditure for **258ES** to be \$42.6 million and that for **321EP** to be \$23.7 million.

PUBLIC CONSULTATION

12. We consulted the Yuen Long District Council on 10 March 2003. Members of the Council supported both projects.

ENVIRONMENTAL IMPLICATIONS

13. We engaged a consultant to conduct Preliminary Environmental Reviews (PERs) for **258ES** and **321EP** in January 2003. 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 –

Project no.	Mitigation measures	Estimated cost \$ million (in Sept 2002 prices)
258ES	(a) Provision of insulated windows and air-conditioning to 30 classrooms from the 1/F to 5/F and one small group teaching room on the 6/F at the southern facade of the classroom block	3.1
	(b) Provision of insulated windows and air-conditioning to five special rooms from the 2/F to 6/F at the eastern facade of the special room block	1.0
		/(c)

⁶ Based on a standard furniture and equipment list prepared by the Education and Manpower Bureau for "Year 2000 design" schools.

Project no.	Mitigation measures	Estimated cost \$ million (in Sept 2002 prices)
	(c) Provision of insulated windows and air-conditioning to one small group teaching room on the 1/F at the western facade of the assembly hall block	0.1
	(d) Construction of a three-metre high boundary wall at the southern side of the site	0.8
321EP	(e) Provision of insulated windows and air-conditioning to 30 classrooms from the 1/F to 6/F and four small group teaching rooms from the 2/F to 5/F at the north-eastern facade of the classroom block	3.2

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. D Arch S 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		C&D materials to public filling areas ⁷		C&D materials to landfills	
		m ³	%	m ³	%	m ³	%
258ES	3 480	2 830	81.3	100	2.9	550	15.8
321EP	2 770	2 270	81.9	80	2.9	420	15.2

The notional cost of accommodating C&D waste at landfill sites is estimated to be \$68,750 for **258ES** and \$52,500 for **321EP** (based on a notional unit cost⁸ of \$125/m³).

LAND ACQUISITION

17. Both projects do not require land acquisition.

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⁷ 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.

⁸ 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/m³), 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

18. We consulted the Legislative Council Panel on Education on 20 January 2003 on our latest plan for building secondary and primary schools. These projects are two of the planned projects. The Panel had no objection to our proposed plan.

19. We upgraded **258ES** and **321EP** to Category B in November 2002. We engaged a term contractor to carry out site investigations in September 2002 and a consultant to undertake PERs in January 2003 at a total cost of \$1.9 million. We charged this amount 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 consultant have completed the site investigations and PERs respectively. D Arch S has completed the detailed design and tender documentation of both projects with in-house staff resources.

20. We estimate that the project will create the following job opportunities –

Project no.	Professional/ technical staff	Labourer	Total no. of staff	Total man-months
258ES	10	135	145	2 700
321EP	5	110	115	2 200

Education and Manpower Bureau
June 2003

**A comparison of the reference cost of
a secondary school project
with the estimated cost of 258ES**

\$ million (in Sept 2002 prices)				
		Reference cost*	258ES	
(a)	Site formation	–	1.5	(See note A)
(b)	Piling	9.0	19.7	(See note B)
(c)	Building	50.2	50.2	
(d)	Building services	12.8	17.8	(See note C)
(e)	Drainage and external works	10.5	13.5	(See note D)
(f)	Contingencies	8.3	10.3	
Total		90.8	113.0	
(g)	Construction floor area	12 238 m ²	12 238 m ²	
(h)	Construction unit cost {[(c) + (d)] ÷ (g)}	\$5,148/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 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. The site formation cost is required to raise the level of the site to that of the adjoining road.
- B. The piling cost is higher because the ground conditions require the use of 220 percussive steel H-piles at an average depth of 43 metres (with approximately 20% requiring preboring through underground obstructions). The increase in the number of piles is due to the presence of pond deposit causing negative skin friction. The piles also need to be driven deeper because of the lower rockhead level.
- C. The building services cost is higher because of the provision of air-conditioning as a noise mitigation measure.
- D. The drainage and external works cost is higher because of the construction of a three-metre high boundary wall as a noise mitigation measure, the requirement to construct a new access road to serve the school sites (including modifications to the adjacent public road) and the provision of shared facilities.

**A comparison of the reference cost of
a 30-classroom primary school project
with the estimated cost of 321EP**

	\$ million (in Sept 2002 prices)		
	Reference cost*	321EP	
(a) Site formation	–	1.1	(See note A)
(b) Piling	7.5	18.3	(See note B)
(c) Building	41.3	41.3	
(d) Building services	11.0	14.2	(See note C)
(e) Drainage and external works	9.5	12.5	(See note D)
(f) Furniture and equipment	–	3.9	(See note E)
(g) Contingencies	7.0	8.7	
	Total	76.3	100.0
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(h) Construction floor area	10 727 m ²	10 727 m ²	
(i) Construction unit cost {[(c) + (d)] ÷ (h)}	\$4,876/m ²	\$5,174/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 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. The site formation cost is require to raise the level of the site to that of the adjoining road.
- B. The piling cost is higher because the ground conditions require the use of 170 percussive steel H-piles at an average depth of 45 metres (with approximately 20% requiring preboring through underground obstructions). The increase in the number of piles is due to the presence of pond deposit causing negative skin friction. The piles also need to be driven deeper because of the lower rockhead level.
- C. The building services cost is higher because of the provision of air-conditioning as a noise mitigation measure.
- D. The drainage and external works cost is higher because of the requirement to construct a new access road to serve the school sites (including modifications to the adjacent public road) and the provision of shared facilities.
- E. The cost of furniture and equipment, estimated to be \$3.9 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.